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DOES PARENTAL QUALITY MATTER? EVIDENCE ON THE TRANSMISSION OF HUMAN CAPITAL USING VARIATION IN PARENTAL INFLUENCE FROM DEATH, DIVORCE, AND FAMILY SIZE

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Does Parental Quality Matter? Evidence on the Transmission of Human Capital Using Variation in Parental Influence from Death, Divorce, and Family Size
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ABSTRACT

This paper examines the transmission of human capital from parents to children using variation in parental influence due to parental death, divorce, and the increasing specialization of parental roles in larger families. All three sources of variation yield strikingly similar patterns which show that the strong parent-child correlation in human capital is largely causal. In each case, the parent-child correlation in education is stronger with the parent that spends more time with the child, and weaker with the parent that spends relatively less time parenting. These findings help us understand why educated parents spend more time with their children.

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I. Introduction

Educated parents tend to have better educated children, and typically spend more time with their children relative to less educated parents. One possible explanation behind both phenomena is that educated parents are more productive in creating human capital in their children. This paper examines this hypothesis using variation in parental involvement stemming from parental death, divorce, and the increasing specialization of parental roles in larger families.

Although there is a large literature on the intergenerational transmission of human capital, there exist large differences in the findings across methodologies. This paper utilizes a new approach based on the idea that the strength of this transmission, if not entirely genetic, should be a function of the "quality" of each parent, interacted with the amount of time and influence ascribed to each parent. Examining this issue empirically is challenging, since each parent's role, time input, and labor force participation are likely to be set as part of a household optimization, as well as being correlated with unmeasured characteristics of the child and parents. For example, a child with learning problems may receive more attention from his/her parents, thus leading to a negative correlation between child outcomes and parental time inputs.

To overcome these empirical obstacles, we use quasi-random variation in parental influence. Parental death increases the role and time input of the surviving parent relative to the one that passes away. Similarly, parental divorce typically leads a child to be increasingly under the care of one parent, usually the mother, relative to the other. Both of these shifts in parental time inputs and influence are intensified if they occur earlier in a child's life. Therefore, we analyze the incidence and the timing of both types of unfortunate events in order to identify the causal effect of parental human capital on a child's human capital.

However, parental human capital can have a direct effect on the production of a child's human capital through parent-child interactions, or an indirect effect by increasing the earning capacity of a parent. Parental death and divorce are cases where the remaining parent's human capital may exert a larger influence over a child's outcomes

due to both the direct and indirect effect – since a surviving or divorced parent is likely to spend more time with her/his children and also to become a primary income source for the household.

We employ three complementary strategies to disentangle the direct from the indirect effect. First, we show that our results are robust to including controls for parental earnings, school fixed effects, and the socioeconomic status of the locality of residence. Second, we exploit the fact that fathers typically earn more and spend less time with children, so that if the primary mechanism is the indirect income channel, the effect of losing a father should be greater than that of losing a mother. In fact, we find the opposite. Lastly, we develop a model that shows that as family size increases, a mother's education should become more important relative to a father's education if time investments are important – since mothers empirically spend more time with children relative to fathers in larger families. Thus, we provide three complementary pieces of evidence that point to the direct quality of time effect being the main channel that links parental education to their children's outcomes.

Our analysis of all three sources of parent-child interaction time is performed with a large sample of all Jewish children born in Israel between 1974 and 1991 that attended secular schools. The information for each child includes parental education levels, family size, changes in parental marital status, and the year of any parental death. The sample is quite large with over 22,000 children who lost a parent before the age of 18, over 77,000 children whose parents divorced before the age of 18, and over 600,000 children who did not experience parental death or divorce before the age of 18. Our outcome variable of interest is whether the child passes the "matriculation exam" in Israel by the end of high school, a high-stakes test required to attend college, which is passed by roughly 57 percent of Israeli students.

Our analysis using parental death as a source of parental influence compares the effects of parental schooling on three separate sets of children: (1) children that did not lose either parent by age 18; (2) children that lost a mother or a father before the age of 18; and (3) children that lost a mother or a father, but after the matriculation exam was completed (after age 18). Using variation across these groups, we test the idea that if

education causes parents to be more effective in producing educated children, the relationship between a parent's education and his/her child's human capital should depend on whether that parent was alive and able to interact with the child before taking the matriculation exam.

The non-random selection of families that suffer a parental loss is addressed using the number of years a child spends with the parent who eventually dies. Specifically, we take a sample of children who are similar in the sense of having suffered the death of the same parent before the age of 18, and examine whether the parent-child relationship in education intensifies with the number of years together before the parent dies. Furthermore, we leverage the discontinuity introduced by the timing of the test relative to the parental death. Within a sample of individuals that lost a given parent, losing a parent after the age of 18 should not have a causal effect on the outcome of a test which was completed by the age of 18, while losing a parent before the age of 18 could have a large impact on the same test. This discontinuity allows us to perform a useful placebo analysis in order to examine the causal interpretation of our estimates.

Our analysis using divorce as a source of parental influence is analogous. This strategy examines children whose parents divorce, and tests whether the education of the mother (the custodial parent in most cases) becomes more important relative to the father if the divorce occurred before the age of 18.

Our analysis using variation in family size is based on the idea that if income is the primary channel linking parental education to children's outcomes, the relationship between them should be weaker in large families where financial investments must be spread among more children. We further show empirically that mothers in larger families spend more time with their children relative to fathers and that their education is a more important determinant of children's outcomes relative to fathers. These findings are consistent with parental time being the main mechanism that links parental education to children's human capital.

Our results display a consistent, striking pattern across each analysis that indicates that parental education has a large causal impact on the human capital of children, and the

size of the impact depends on the amount of time a child spends with each parent. If a mother dies, her education becomes less important for the child's outcomes, while at the same time, the father's education becomes more important. If a father dies, the reverse happens – the father's education becomes less important while the mother's education plays a larger role. Importantly, these relationships intensify when the parent dies when the child is younger. That is, the effect of a father's education decreases with the amount of years the child spends with a mother that eventually dies, while the effect of the mother's education increases with each year that she remains alive. A similar pattern, in reverse, occurs when the father dies. Furthermore, our placebo analysis shows that the parent-child relationship in schooling does not depend on the child's age at the time of parental death if the death occurs after the matriculation exam was completed (in 12^{th} grade). This finding suggests that our main results regarding those that lost a parent before the test was taken are not due to the non-random selection of families that suffer a parental death.

The generalizability of these estimates is further supported by results using parental divorce as the source of variation in parental influence. The human capital of mothers who get divorced before the child turns 18 becomes a stronger determinant of the child's matriculation outcome relative to the father's human capital. The same pattern is found for children in larger families where parental roles are increasingly specialized – the mother's human capital becomes more important relative to the father's as the number of children increases.

Overall, the similarity of the results across three different samples that comprise the entire population (children who suffered a parental death, children who experienced divorce, and those that experienced neither one) provides strong evidence that the amount of parent-child interaction time is driving our results. In addition, we find two other striking patterns which are consistent across all three analyses: the results are stronger for girls relative to boys, and the results are stronger for children with less educated parents.[1] The latter finding may be due to the idea that our outcome is not a "high

[1] The gender results are consistent with recent evidence that girls are more affected by their childhood environment relative to boys (Kling, Liebman, and Katz (2007) and Gould, Lavy, and Paserman (2011)).

achievement" measure, but rather is a milestone achievement for children that typically come from families in the middle to low end of the socioeconomic spectrum.

As indicated above, the intergenerational transmission of human capital has received considerable attention in recent years.[2] Recent studies generally employ one of two strategies: (i) using twin parents or adopted children to control for the genetic transmission of human capital;[3] or (ii) using an instrument for parental education (such as changes in compulsory schooling laws).[4]

Overall, the results from the twins and adoptees studies point to a small, but significant effect of father's education, and no effect of a mother's education.[5] The IV findings point to a small effect of the mother but not the father on child schooling levels, but stronger effects on other outcomes like test scores and grade retention.[6] Although the differing results in the literature could be due to differences in the time period and country used in the analysis, studies which apply each method to the same data show that the variation in results is largely due to the methods, not the different sources of data (Holmlund et al. (2011) and Haegeland et al. (2010)). These papers suggest that different strategies produce different results because each method is using variation in a different part of the parental education distribution. For example, IV studies using compulsory schooling laws are using variation in the 7th to 9th grade part of the distribution, while adoptive parents tend to come from the higher end of the education distribution.

Our main contribution is to introduce a new empirical strategy, using variation in parental influence, to investigate the causal effect of parental education on the human capital of their children. Following a previous version of the current paper (Gould and Simhon (2011)), Kalil et. al.'s (2016) analysis exploited variation in time spent with

[2] Excellent summaries of the literature are presented in Haveman and Wolfe (1995), Black and Devereux (2010), and Holmlund, Lindahl, and Plug (2011).
[3] See Behrman and Rosenzweig (2002), Plug and Vijverberg (2003), Plug (2004), Bjorklund et al. (2006), and Sacerdote (2007).
[4] Black, Devereux, and Salvanes (2005), Oreopoulos, Page, and Stevens (2006).
[5] These results are similar to those in the fourth strategy in the literature, which is to use a structural approach. Belzil and Hansen (2003) find a negative effect of a mother's education on her children, while a father's education has a positive effect.
[6] Larger effects are found for non-schooling level outcomes in Oreopoulos, Page, and Stevens (2006), Sacerdote (2007), Maurin and McNally (2008), and Carneiro, Meghir, and Parey (2013).

fathers due to paternal death, and found similar results on children who lost a father. However, their study did not examine maternal death, which is important for disentangling mechanisms. Nor did they consider variation in parental time inputs due to divorce or family size. These extensions are important for exploring whether the results for families that underwent a tragic parental shock can be generalized to the rest of the population, and also for addressing the indirect effect of parental income.

Our estimates are much larger than most of the literature which measures child outcomes with their completed schooling levels. However, our findings are similar to studies that yield significant effects on children's test scores and grade repetition. In addition, our analysis supports the idea that the differences in the findings within the existing literature are due to each method using different parts of the parental education distribution. Across all three analyses, we find much stronger effects of parental education from the lower part of the distribution, which is consistent with the idea that the IV results are larger than the adoptee findings because the former is shocking the lower part of the parental education distribution while the adoptee strategy is using variation from the upper tail.[7]

Finally, our analysis sheds light on the important findings of Guryan, Hurst, and Kearney (2008) that show how the time allocation of parents for child activities varies with parental education. Specifically, they show that educated women spend much more time with their children than less educated women, despite having a higher cost of time and higher employment rates. This pattern holds across several countries, and persists even after controlling for labor force participation. For working men, a strong, positive relationship is also found between education and each category of childcare.[8] For

[7] Our analysis is also related to the literature on the general effect of parental death on child outcomes. See Corak (2001), Lang and Zagorsky (2001), Gertler, Levine, and Ames (2004), Case, Paxson, and Ableidinger (2004), Case and Ardington (2006), Chen et al. (2009), and Adda et al. (2011). However, we are the first to extensively analyze how the effect of a parental death varies with the education level of each parent and the age of the child when a parent dies. Our findings contribute to the literature on the effect of parental death by confirming that the average effect is minimal, but that losing a parent is much more detrimental when the parent is educated and when the child is younger at the time of the loss, and that the adverse effect of the loss is mitigated by a higher level of education for the surviving parent.

[8] Guryan, Hurst, and Kearney (2008) show that mothers spend roughly double the amount of time on child care than fathers, and this is true when comparing working mothers to working fathers. However, men spend a larger proportion of their time with children doing recreational activities.

example, college-educated men in the labor force spend more than twice as much time on all types of childcare activities than less-educated men. In general, educated parents have higher opportunity costs of time, and this leads them to reduce their time allocation to non-market related activities. As a result, we would expect parental education to reduce their time investments in children as well, but since the opposite occurs, Guryan, Hurst, and Kearney (2008) suggest that a "possible explanation for the educational gradient in child care points to the question of whether parental time investments in children are correlated with increased child human capital, and whether this relationship is stronger for more-educated parents."[9]

Our analysis provides evidence that this is the case.[10] In general, examining this issue empirically is difficult due to the lack of data and because of the endogeneity of parental time inputs with the characteristics of the child. For example, some parents may spend a lot of time with their children because they have difficulties doing their homework, which may lead to a negative correlation between parental time and child outcomes. Alternatively, parents may enjoy spending time with children who are more successful from a social and academic perspective, thus leading to a positive correlation between parental time and child schooling.

By using three sources of variation in parental time and influence, our analysis shows that education makes mothers and fathers more effective in producing human capital in their children. This finding contributes not only to the literature on whether parental education increases child outcomes, but also sheds light on the mechanisms by highlighting the importance of the interaction time between the child and each parent.

[9] This issue dates back to the work of Leibowitz (1974a, 1974b, 1977), which showed that child care time is positively correlated with socioeconomic status, and that the reported time a parent spent with a child was positively correlated with the IQ of boys but not girls, but was not associated with higher schooling after controlling for IQ. Coleman (1988) also argued that a parent's level of education would influence a child less if the parent does not interact with the child.

[10] Very few papers have even examined this issue empirically. Datcher-Loury (1988) provides evidence that time investments of well-educated mothers raise child schooling, but time investments by less-educated mothers appear to be ineffective. However, Datcher-Loury (1988) uses PSID data which does not have information on the actual time invested in childcare activities. Instead, time spent on childcare is estimated using information on total housework time, hours worked in the labor force, and number of children. The analysis in Datcher-Loury (1988) does not address the endogeneity of parental time investments, and does not consider the time investments of fathers.

These investments in children not only affect a child's education, but may well have future payoffs in terms of health, fertility, crime, and marital success.[11]

II. Theory

To organize our empirical strategy and findings, this section outlines a simple model which produces five empirical implications. The details and proofs of the model appear in Appendices A and B, available online. We highlight the challenges in disentangling the mechanisms by which parental education affects their children's human capital and how each layer of our analysis can shed light on potential mechanisms.

The model characterizes parental investments in their children's human capital, k, during a single period of childhood, which determines the child's test performance at the end of childhood (age 18). Parents choose their own consumption, c_j, time with the child, l_j, which are both parent-specific, $j \in \{m, f\}$; and an amount to invest financially in the child, e. We assume that household utility at time *t* is a Cobb-Douglas function of each parent's consumption, time with the child, and the continuation value of the child's human capital, k.[12] Denoting the parameters of the household utility function by α's yields:

$$u(l_m, l_f, c_m, c_f, k) = \alpha_{lm} \ln l_m + \alpha_{lf} \ln l_f + \alpha_{cm} \ln c_m + \alpha_{cf} \ln c_f + \alpha_k \ln k.$$

Human capital at the end of childhood, k, depends on human capital at birth, k_0, and is a Cobb-Douglas function of the time spent by each parent with the child (provided that both parents are alive), the financial investments in the child, e, and a total factor productivity (TFP) term, $R(s_m, s_f)$, which depends on each parent's schooling, s_m and s_f. In our context, TFP represents the quality of parenting conditional on the amount of time and money invested in the child. We assume TFP to be a non-decreasing function of

[11] For example, Lochner and Moretti (2004) show that schooling reduces criminal activity. In addition, parental education could affect a child's human capital by affecting the child's health (Currie and Moretti (2003)).

[12] Our model is inspired by that in Del Boca et. al. (2014), but we modify their model in a number of ways described in the Appendix A.

each parent's schooling. Denoting the parameters of the production function by δ's yields:

$$lnk = R(s_m, s_f) + s_m^{\theta}\delta_m lnl_m + s_f^{\theta}\delta_f lnl_f + \delta_e lne + \delta_k lnk_0.$$

This formulation allows for a parent's schooling to affect both TFP (through $R(s_m, s_f)$) as well as the marginal returns to time investments (through s_j^{θ}).[13] Genetics are a confounding factor in many studies of the effect of parental schooling on children's human capital. In this setup, genetics are captured by the initial level of human capital, k_0, which is allowed to be correlated with s_m and s_f.

Parents maximize their utility subject to the law of motion for human capital and the time and budget constraints. The time constraint is:

$$T = l_j + h_j, \quad for\ j \in \{m, f\},$$

where h_j denotes hours worked by parent *j*. The budget constraint is given by:

$$c_m + c_f + e = w_m h_m + w_f h_f + I,$$

where *I* denotes unearned income and w_j denotes the wage of parent *j*.

We first solve for the optimal investments and then for the realized value of the child's human capital at the end of childhood. The model shows that a child's human capital is increasing in the schooling level of each parent, but the effect of parental schooling cannot in general be separated from the effect of genetics represented by k_0. This finding highlights one of the primary challenges to the identification of the causal effect of parental schooling in the literature – namely, if parental schooling is (positively) related to k_0, then a regression of a child's human capital on parental schooling will be biased upward (Implication 1).

This obstacle can be overcome using variation in the timing of parental death during childhood. Incorporating these elements into the model, we can difference out the

[13] This formulation allows for mother's schooling to have a greater effect on TFP than father's schooling as would arise if mothers are more likely to make decisions that affect children, or vice versa.

confounding factor of genetics by comparing the relationship between a parent's education and a child's human capital for a parent who dies earlier in the child's life to that for a parent who dies at a later stage in the child's life, or is living when the child takes the test at age 18 (Implication 2).

Beyond identifying the causal effect of parental schooling, we seek to distinguish between the direct effect of parental education on the productivity of time spent with children versus the indirect effect of parental education on family income. To disentangle these mechanisms, we leverage patterns in time allocation and wage rates between mothers and fathers. Specifically, mothers typically work and earn less (overall and per hour) and spend more time with children than fathers. Thus, the loss of a mother will have a larger impact on time spent with the child and a smaller effect on family income than the loss of a father. Consequently, a finding that the survival of mothers increases the effect (on children's human capital) of mother's schooling more than the survival of fathers increases the effect of father's schooling implies that a parent's schooling affects children's human capital through time investments and that the time channel dominates the expenditure channel (Implication 3).

The relative importance of the direct and indirect channels can also be illuminated from how the death of a parent affects the importance of the surviving parent's schooling, which we refer to as "substitution." Intuitively, and as shown by Fadlon, Itzik and Nielsen [2015], for most households, mothers will increase time working when a father dies, but when a mother dies, fathers will, if anything, spend less time working. If time investments are not important, the increase in mother's work when the father dies will lead her schooling to become more important, but the death of a mother will not induce the same increase in the importance of a father's schooling and may cause the father's schooling to become less important.

Therefore, a finding that the death of a mother leads to more substitution away from mothers and toward fathers (as measured by the relative importance of their human capital for children's human capital) than the death of a father generates away from fathers and toward mothers, implies that parental schooling affects children's human capital through time investments (Implication 4). A finding that later death reduces

substitution more when a mother dies relative to when a father dies further indicates the importance of time investments.

Divorce

Although the incidence and timing of parental divorce is less likely to be exogenous than parental death, divorce is far more common and has similarities to paternal death in that mothers typically retain custody in most societies. Given this institutional setup, our model's predictions and results regarding paternal death are also applicable to families experiencing parental divorce. As such, our empirical analysis of parental divorce serves as a robustness check for our findings regarding paternal death.

Family Size

Information about the mechanisms that connect parental schooling to children's human capital can also be obtained from variation across households of different sizes. Intuitively, in the absence of an effect of time on children's human capital, increases in family size dilute the effects of parental schooling on children's human capital because financial investments are spread across more children. Moreover, parents in larger families typically display a stronger degree of specialization in terms of their time allocation to child rearing, and therefore, this variation produces testable implications for how a child's human capital depends on the schooling level of each parent. The model shows that if time investments are important, a mother's schooling will become more important for the child's human capital relative to the father's schooling if mothers increase their time with children relative to fathers in larger families. The reverse is true if the relationship between parental and child human capital is due to parental income (Implication 5). Therefore, variation in household size allows us to shed light on the importance of the direct effect of parental time versus the indirect channel of parental resources in the determination of the positive relationship between parent and child human capital.

III. Data

Our empirical analysis uses data from the official Population Registry of Israel and the Ministry of Education. Every citizen of Israel has a record in the Registry with his or her name, identity number, immigrant status, date of birth, date of death, marital status, and the identity number of each parent. This information was used to ascertain the number of siblings for each person and their birth order.

These demographic variables were matched to the student-level data provided by the Ministry of Education, which contain information on each student's performance on the various subjects (math, Hebrew, English, bible studies, science, etc.) which compose the matriculation exam taken during the 11^{th} and 12^{th} grade. We received this data for all high school students scheduled to graduate between 1992 and 2009 (born between 1974 and 1991), as well as information on each student's gender, immigrant status, education levels of both parents, and an indicator for the specific high school attended (without revealing the name or location of the school). We restricted the sample to the majority population of native-born Jews who attended secular public schools.

Table 1 provides descriptive statistics for the analysis of parental death. (Appendix Tables A1 and A2, available online, provide the breakdown of parental death by causes of death and by age of the child.) The first two columns present the sample used in our analysis of maternal loss, by comparing the means of the variables for those that did not lose a mother by the age of 18 to those that did. It is worth noting the size of the samples used in our analysis – the data contain 6,173 children who lost a mother by the age of 18 and 616,843 children who did not lose either parent before age 18 (this group includes children who will be studied in the divorce analysis and family size analysis). Table 1 shows that the passing rate of the matriculation exam is only 60% for those who did not lose a parent, and slightly lower for those that lost a mother (54%). These numbers show that passing the matriculation exam is an important milestone which has a lot of variation.

The first two columns in Table 1 present evidence that losing a mother is not an exogenous event, since it appears to be correlated with family background characteristics.

Families that suffered a maternal loss have lower education levels for both parents and lower income levels. (To account for temporary fluctuations in wage income, we measured each parent's income with their estimated individual fixed-effect from a typical Mincer-like regression of log income on education, age, and person fixed-effects using wage data from 1988-1990.) The differences in parental characteristics are not dramatic, but they could possibly explain why children who lost a mother had a lower matriculation rate, without there being any causal effect of the death on the child's performance. However, our focus is not to explain this difference, but rather to examine how the relationship between parental and child schooling changes when a parent dies, and how this varies with the age of the child when the parent died.

The last two columns of Table 1 present the means for the samples used in our analysis of paternal death. Again, the samples are large. Roughly three times as many children lose a father as lose a mother, which stems from the fact that fathers tend to be older than mothers, and women tend to live longer than men. However, losing a father seems to be less random than losing a mother. The difference in means between the sample that lost a mother and those that did not, is smaller than the difference for paternal deaths. However, as noted above, our strategy utilizes not only information on those that lost a parent versus those that did not, but also variation within those that lost a parent based on the age of the child at the time of parental death.

Table 2 presents descriptive regressions for children who did not experience parental death. A dummy variable for the student passing the matriculation exam by the end of 12^{th} grade is regressed using OLS on our core set of control variables: education levels of both parents, ages of both parents when the child was born, number of siblings, gender, cohort fixed-effects, and birth order. The first two columns show that entering the education level of one parent but not the other yields coefficients that are very significant, but most likely biased due to assortative matching in the marriage market. This can be seen by the reduction, by almost a half, in the coefficient on either parent's education when the education levels of both parents are included in the third column. Behrman and Rosenzweig (2002) found a similar pattern using data from the United States, which shows that our Israeli data is similar to other studies.

Columns (4) and (5) in Table 2 show that estimates on parental education levels are reduced in size, but still significant after controlling for school fixed-effects and for the socioeconomic index of the locality. The next three columns show similar results for the earnings of both parents – the wage income fixed-effect for both parents is positive and highly significant, even after controlling for school fixed-effects and socioeconomic status. The last two columns include parental education and income levels in the same specification, and show that the effect of parental education is less sensitive to the inclusion of parental wages than vice versa.

Table 3 presents a preliminary analysis of parental death. The left panel shows estimates for the children that did not experience parental death, the middle panel uses a sample of those that suffered maternal loss, and the right panel uses a sample of those who suffered paternal loss. A striking pattern emerges when comparing the coefficients across the three panels. For individuals that lost a mother before the age of 18, the estimated coefficient on the mother's education is about 50 percent smaller than the same specification for the sample that did not suffer a parental death. At the same time, the estimated coefficient on the father's education is about 10 percent larger. Similar patterns are found for parental income.

Comparing the results for those that lost a father to those that did not lose either parent produces the opposite pattern. The coefficient on the mother's education increases while the coefficient on the father's education declines (by close to 50%). The death of a parent apparently reduces the importance of that parent's education level, while increasing the importance of the surviving parent's education. This pattern demonstrates one of the main points of the paper – the effect of a parent's education level on a child's schooling outcome depends on whether the child lived with that parent or not. This finding implies that the transmission of human capital from parents to children is not entirely genetic, and that children learn more from an educated parent. The rest of the paper investigates these patterns more extensively and seeks to disentangle underlying mechanisms.

IV. Analyzing Maternal Deaths

The first column in Table 4 uses a sample of all individuals that did not lose a father and includes a dummy for losing a mother, a dummy for losing a mother before the age of 18, and interactions between losing a mother before 18 with the education level of each parent. These interaction coefficients indicate that the effect of a mother's education declines significantly if the child suffered a maternal death before the age of 18, and the effect of the father's education increases, but not significantly. This finding is robust, and increases in size, when we control for school fixed-effects and the local socioeconomic index. Column (4) interacts the dummy for losing a mother before 18 with the difference in the education levels of both parents, and shows that the mother's education becomes significantly less important relative to the father's when a mother dies before the child is 18 (the "substitution" process described in the theory section). These findings show that losing an educated mother is more costly than losing a less-educated mother, and that the effect of maternal education on her child's schooling seems to depend on whether she was around during her child's youth.

The right panel of Table 4 examines whether the importance of both parental education levels varies with the actual number of years spent with the mother before she dies. The estimates indicate that every year spent with the mother increases the influence of a mother's education on her child's performance, but decreases the effect of the father's education. This analysis shows that a mother's education becomes less important relative to the father's when a mother dies before the child is 18, but this pattern is attenuated by the child spending more years with both parents before the mother dies (i.e. less/more substitution if the mother dies later/earlier in life). Interestingly, the size of the coefficients indicate that the effect of a mother's education is essentially zero if she dies right after the child is born (the coefficient in column (5) on the direct effect of losing a mother is –0.0287 compared to the 0.0260 coefficient for all individuals), but every additional year of life for the mother adds 0.0021 to the effect of her education on the child's passing rate. In contrast, the effect of the father's education on the child's passing rate increases from 0.0262 to 0.0428 (0.0262 + 0.0166) if the mother dies when the child is born, but every additional year that the mother lives reduces significantly the effect of

the father's education by 0.0013. In other words, if the mother dies when the child is born, her education has no effect on the child while the father's education has a large effect, but the effect of each parent moves towards one another as the child spends more time with both of them rather than just the father.

All of the findings in Table 4 are robust to controlling for school fixed-effects and the local socioeconomic index. This robustness is notable because Table 2 showed that a naive analysis which uses a sample of children that did not suffer a parental loss produces coefficients on parental education that are sensitive to whether school fixed-effects are included in the specification or not. In contrast, the interaction coefficients of interest in Table 4 are not sensitive to the inclusion of school fixed-effects, which lends credence to the causal interpretation of our estimates.

Appendix Table A3 investigates whether the results in Table 4 are robust to the inclusion of parental income variables in the specification. The importance of the mother's education overall and relative to the father's education increases for each year that the mother survives even with parental income variables and their interactions with the incidence and timing of maternal death. Moreover, the interaction between the timing of a mother's death and the parental income variables are consistently insignificant.[14]

We now extend our analysis of maternal loss in several directions. First, we examine the issue of remarriage by the surviving parent. When a mother dies before the

[14] The upper panel of Appendix Table A3 specifies interactions between each parent's education or wage level with the incidence of mother loss, as well as the timing of the loss. The bottom panel examines how maternal loss and its timing affect the importance of the mother's education or income level relative to the father's. We measured each parent's income with their individual fixed-effect from a Mincer-like wage using data from 1988-1990. Therefore, including parental income requires us to condition our sample on those that did not lose a mother or father before 1991. The first two columns show that there is little change when this sample restriction is made for the specification that does not include interactions for the timing of maternal death. The next two columns show that a mother's education or income become less important if she dies before the child turns 18, while the father's education or income becomes more important. However, only one of the four coefficients is significant. Including parental education and income in the same specification in column (4) yields stronger results for parental income, but the opposite is true when interactions with the timing of death are included in column (7). This specification shows that a mother's education becomes significantly less important relative to the father's education if she dies before the child is 18, but every year she lives increases the relative importance of her education. This result is not significant using parental income in column (7). Moreover, the addition of controls for parental income and the interactions have no effect on the main results for parental education (columns (5) or (6) versus (7), or (12) versus (14)). The right panel reports similar results in which children are excluded if either parent had zero income.

child reaches 18 years old, almost 13 percent of the fathers remarried before the child reached the age of 18. To see how this might affect our results, we restrict the sample to cases where the father did not remarry in column (2) in Table 5. This restriction does not reduce the size or significance of our main coefficients of interest. The interaction between the child's age when the mother died and maternal education actually increases from 0.0015 to 0.0018, while the interaction with paternal education remains at –0.0009. This pattern suggests that the phenomenon of remarriage, if anything, biases our main results towards zero. This finding is consistent with the idea that a mother who dies can be at least partially replaced with a second wife, and therefore, the negative effect of losing a mother can be mitigated by spending time with the new wife.[15] If the father does not remarry, the effect is more acute, since no one else can compensate for the loss of time spent with the mother other than the father.

Table 5 also shows how the results differ between boys and girls. Columns (3) and (4) show that the loss of a mother has an impact on both boys and girls (see the coefficients on the interactions between "mother died when child < 18" with each parent's education level). However, the results are more significant and dramatically larger for girls versus boys. For example, the interaction of the child's age at maternal death with maternal schooling is 0.0010 for boys and 0.0022 for girls. The analogous interaction for paternal education is -0.0003 for boys and -0.0016 for girls. These findings suggest that boys and girls are negatively affected by maternal loss, but the effect for girls depends much more on the education levels of both parents.

The idea that girls respond more to variation in their environments is supported by recent evidence. Kling, Liebman, and Katz (2007) found that being in a safer neighborhood had beneficial effects on education, risky behaviour, and health for girls, but not for boys. Gould, Lavy, and Paserman (2011) found that girls are affected more than boys by the early childhood environment over the course of their lifetime across an array of social and economic outcomes. Therefore, our results contribute to the growing

[15] Our data contains only an indication that the surviving parent's marital status was changed after the spouse died. If the status did change, this indicates that the surviving spouse did re-marry during the relevant time period. But, we do not have information on the new spouse.

literature on the differences in the way boys and girls are influenced by their environment.

The estimates in Table 5 are also clearly much stronger for children who lost a less-educated mother (less than 12 years of schooling) versus a mother with at least a high school degree. As noted above, one of the explanations for the variation in the findings of the existing literature is based on the idea that different identification strategies are using different parts of the parental education distribution. Our findings are consistent with the larger effects in the literature with instrument variables that shock the lower end of the parental education distribution versus the weaker effects found in the "adoptions" studies that shock the upper tail of the parental education distribution. Also, our findings support the idea that basic knowledge in parents is the critical factor in terms of imparting the human capital to children necessary to pass a critical, but minimal level of academic achievement like the matriculation exam. If we examined an outcome for a more advanced level of education (such as receiving a BA degree or more), it is possible that higher levels of parental education could play a larger role.

The results in Table 5 are also similar for families that lost a mother that was the better educated parent versus situations where she was less educated than the father. The similarity of the results across these two distinct groups provides evidence against the idea that our main results are coming from cases where the mother was the more dominant decision maker within the household – assuming that mothers who are better educated than fathers are likely to have greater bargaining power and a greater role in household decision-making. It also suggests that the effects are not being driven by parental income in the sense that more educated mothers tend to have higher earnings relative to their husbands than other mothers. The last two columns show that the effects are larger for children with two or fewer siblings than children with more siblings.

Appendix Table A4 examines the different components of the matriculation exam: math, Hebrew (the verbal section since Hebrew is the native language), Bible Studies, and English. The results for the overall matriculation rate are very similar to those obtained for receiving a score on Hebrew above 70, and smaller and less significant for the other components of the matriculation exam. In addition, the results are often

similar to those obtained with a cutoff of 70 and 80, but they appear to be stronger in size and significance using the lower cutoff level. This pattern again suggests that the effect is coming more from the marginal students on the brink of failing the exam, who are more likely to come from the lower part of the parental education distribution, rather than the higher ability students not being able to achieve a high score due to the loss of their mother.

A placebo analysis is conducted in Table 6, which uses a sample of individuals who lost a mother after the matriculation exam is completed at the end of high school. If the results are similar for a sample of individuals whose passing rate would be unlikely to be influenced by the future death of their mother, this pattern would suggest that our previous results are likely due to the selection of individuals based on unmeasured characteristics which are correlated with our variables of interest, rather than representing a causal relationship.

However, the results in Table 6 are markedly different from those in the previous tables. The interaction coefficients between each parent's education level and the age of the child when the mother died are not significant, and are the opposite signs of those in Table 4. These findings show that our main results regarding those that lost a parent before the test was taken are not due to the non-random selection of families that suffer a maternal death, and thus lend strong support to the causal interpretation of the results.

V. Analyzing Paternal Deaths

This section analyzes the effect of parental education using paternal deaths instead of maternal deaths. This analysis has two objectives. The first is to probe the robustness of the main findings in the previous section, which showed that the importance of a parent's education in determining the child's education outcome depends on how much time the child spends with that parent alone versus both parents. The second objective, as discussed in the theory section, is to compare the effects of losing a father to those of losing a mother in order to shed light on underlying mechanisms.

Table 7 shows that losing a father affects the relationship between the child's outcomes and the education levels of both parents. This can be seen by the positive and significant interaction between the mother's education with losing a father before the age of 18, and the significantly negative coefficient on a similar interaction with the father's education. Similar to the previous section, the table reveals that losing an educated parent hurts the child more, but the loss can be mitigated by higher levels of education for the surviving parent.

Table 7 (column 5) also shows that every year spent with the father increases the value of his education by 0.0006, compared to a negative coefficient on the interaction with mother's education of -0.0002. Although the latter estimate is not significant, there is a positive and significant direct effect of the mother's education when the father dies below the age of 18. That is, a father's death increases the importance of the mother's education, but it does not significantly differ across the age level of the child at the time of paternal loss.

Overall, the coefficients of interest are the mirror image of each other in terms of their sign relative to the analysis of maternal death. This is what we would expect if the estimates are picking up a causal effect, since in both cases where either the mother or father died, the estimates are showing that the time spent with each parent increases the importance of that parent's education in the formation of human capital in their children. However, this is not what we would expect if the estimates are spuriously picking up unmeasured characteristics of the household and environment. Families that suffer a maternal death are similar to those that suffered a paternal death according to their observed characteristics – they both tend to be less educated and have lower income than the general population. If their unobserved characteristics are similar as well, this should generate similar patterns regardless of whether the mother or the father died. Our finding that the coefficients completely reverse sign provides strong evidence that the results are driven by the child's interaction time with each parent, and not by a correlation between parental schooling and unmeasured characteristics of the childhood environment.

However, although the coefficients of interest reverse sign for parental death versus maternal death, the magnitudes are much larger for maternal death. This can be

seen by comparing the results for column (8) in Table 4 for maternal death to the same column in Table 7 for paternal death. Losing a mother before the age of 18 in Table 4 decreases the effect of mother's education relative to father's education by -0.0195, while losing a father increases the mother's education relative to the father by 0.0100. Every year spent with the mother before she dies increases the relative importance of the mother's education by 0.0014, while every year with the father before he dies decreases the relative importance of the mother's education by -0.004. Both coefficients of interest are at least twice the size for maternal death relative to paternal death, albeit with the expected opposite signs.

As discussed in the theory section, this pattern is inconsistent with our main results being driven by the indirect income channel rather than the direct effect of parental human capital on a child's outcome. Relative to mothers, fathers spend more time working and less time with their children. Therefore, if the effect of parental income on children is driving our results, we should expect the loss of a father's income to have a stronger effect on the child than the loss of a mother. Our findings indicate the opposite – a child's outcome is more sensitive to the loss or presence of the mother rather than the father. Appendix Table A5 shows that our main results are robust to the inclusion of parental income variables and their interactions with the time of the father's death.

Table 8 examines whether the findings vary across different types of families. There is little change after restricting the sample to mothers who do not remarry. Similar to the maternal loss analysis, the results are stronger for girls versus boys and for families where the father is less educated (less than 12 years of schooling) versus more educated (at least a high school degree). The findings do not seem to depend on whether the father was more or less educated than the mother, but are stronger for smaller families. Appendix Table A6 shows that the interactions coefficients of interest for the Hebrew component of the matriculation exam are similar to the overall score, although the findings for the other components are more significant than those found in the analysis of maternal loss.

Table 6 performs a placebo analysis by using a sample of individuals who suffered a paternal death, but at an age where it should have no effect on their matriculation exam (after 12th grade). The interaction of the child's age when the father died with the father's education is not significant, and the analogous interaction with the mother's education is also insignificant. These findings lend further support to the causal nature of our estimates regarding those that lost a father below the age of 18.

VI. Divorce

A parental death represents a tragic case where there is a dramatic shift in parental influence. Divorce also shifts parental influence, albeit less extremely, usually by giving custody to the mother. This section investigates the robustness of our findings to the more common occurrence of parental divorce.

Table 9 uses a sample of children that did not suffer a parental death before age 18, and examines how each parent's education level affects the child's matriculation outcome and how this interacts with parental divorce. The first column shows the relationship between parental schooling and the matriculation exam passing rate for all children who do not experience parental death, and the next two columns split the sample into those that experienced parental divorce before the age of 18 versus those that did not. A mother's education is a larger factor for the matriculation of children whose parents divorced before they turned 18, while the father's education is smaller in magnitude. Consistent with our theoretical predictions, these findings are similar to the parental death analysis – the education of the parent with greater influence is more important relative to the education of the other parent.

Column (4) of Table 9 shows that these patterns are statistically significant, while the next two columns show that this finding is robust to controlling for school fixed-effects and the local socioeconomic index. Column (7) leverages variation in the timing of divorce, and shows that the mother's education becomes more important than the father's in divorced families, but the effect gets smaller if the divorce occurs later in

childhood. The latter effect is similar to the parental death results, but is not statistically significant.

The right panel investigates whether these patterns differ across various groups. Again, the findings are stronger for girls relative to boys and when we use the lower half of the parental education distribution (mothers who are not high school graduates). The only slight difference with the parental death results is that we find stronger results for children whose mother is more or equally educated than the father, as opposed to mothers who are less educated than the father. This pattern could be due to children spending more time with the father when he is more educated than the mother (a father's time with children is in general positively correlated his education), and/or perhaps with more custodial power. However, the overall pattern of the results across different subgroups is remarkably similar to the parental death findings, thus reinforcing the causal interpretation and the generalizability of those results.

VII. Family Size

We have provided a variety of evidence that the effect of a parent's education on a child's schooling outcome operates through a direct time channel, not an indirect income channel. This section exploits variation in family size to provide additional evidence. In particular, our model shows that if parental education does not operate through time, the effects of parental education should be declining in family size because financial investments must be spread across more children. In addition, our model predicts that mother's education becomes more important relative to father's education as family size increases if parental time is important and if mother's time with children increases in family size relative to father's time.

Table 10 analyzes the effect of parental education on the child's matriculation exam passing rate, and how this varies with family size. The first two columns split the sample of children (who experienced no divorce or death before the age of 18) into those with fewer (less than or equal to 2) versus more (greater than 2) siblings. The estimated effect for maternal schooling increases from 0.024 to 0.031, while the effect for father's

schooling increases slightly (increasing from 0.025 to 0.026). Mother's education becomes more important in larger families, and this finding is statistically significant, as seen in the remaining columns. In particular, the third column pools all children together, and shows that each additional child increases the effect of mother's schooling by 0.0038, in contrast to an increase in 0.0010 for father's schooling. Both findings are statistically significant, and the bottom panel shows that the relative effect of mother's education versus father's education increases significantly as well. These findings are robust to the inclusion of controls for the socioeconomic index of the locality, log total family income, and school fixed-effects. As our model shows, the finding that the education of both parents becomes more important in larger families is inconsistent with financial investments being the mechanism linking parental education to children's outcomes. The model also showed that the larger increase in maternal education lends further evidence against the parental income mechanism if mothers specialize more in care-giving relative to fathers in larger families.

Table 10 also shows how these results differ across subgroups of the population. The results are larger for girls relative to boys, and for children with mothers on the lower end of the parental education distribution (less than a high school graduate) rather than from the upper portion of the distribution. These patterns are strikingly similar to our results using variation in parental influence due to death and divorce. This similarity supports the external validity of those results to a much wider segment of the population, and lends support to the idea that our findings across all segments of the population are due largely to the role of parental time rather than income.

Our main source of data does not include information on time use, so in order to test the hypothesis of greater specialization of parental roles in larger families, we use the Israel Time Budget Survey 1991/1992 to analyze a similar sample from the same time period. Using a sample of married parents below the age of 60 who have at least one child, we examine various categories of time use in Table 11. The first two columns show that females (mothers) are less likely to work, and this gets weaker if the female is more educated. An increasing number of kids reduces the chances that either parent works, with no significant difference between mothers and fathers. The third column

shows that an increasing number of children has no effect on time with children by men, but has a positive impact on a woman's time with children. Similar to the findings in the US and other countries, column three shows that education increases time with children for both parents, although more so for women.

The right panel of Table 11 repeats the analysis but includes additional interactions between education, the number of children, and gender. These interactions are insignificant across all specifications. Thus, the finding that mothers spend more time with children relative to fathers when the number of children increase (from column 3) holds across parental education levels.

Table 12 analyzes the employment status of mothers in our main data set from the Ministry of Education. The first column uses the mothers of all the children in our data set that did not experience a parental divorce or death, and the other columns restrict the sample to various cohorts defined by the child's year of birth. The table shows that educated mothers are more likely to work. Labor force participation for mothers decreases in larger families, and this pattern does not depend on the relative education levels of each parent.

The findings in Tables 11 and 12 show that more children increase the amount of time spent with children by mothers relative to fathers, with some evidence suggesting a decrease in labor force participation for mothers as well. These patterns are similar across the education levels of both parents, which indicates a general increase in the specialization of parental roles in larger families.

Based on the evidence in previous tables that mothers in larger families spend more time with children relative to fathers, but do not increase their labor force participation, the findings in Table 10 are not consistent with the model when parental schooling affects a child's human capital solely through income, but are consistent with a time channel. Mothers in larger families are not providing more income to the family, but they are investing more time with children. Overall, these results support the interpretation that the importance of parental schooling on child outcomes depends on the degree of parental time and influence.

VIII. Conclusion

This paper uses variation in parental involvement to identify the causal impact of parental education on the development of their children's human capital. We use three distinct samples to analyze three different sources of variation in parental influence: parental death, parental divorce, and the higher degree of specialization of parental roles in larger families.

In all three analyses, we find that a parent's education becomes a more significant determinant of a child's human capital when that parent's interaction time with the child increases. Specifically, we show that a mother's death reduces the importance of her education in producing human capital in her children, but this reduction is less severe if the child was older at the time of her death. In contrast, the father's education increases in importance when the mother dies, but by a lesser amount if the child was older when the mother died. Strikingly, the same patterns exist in reverse when the father dies, but the magnitudes are smaller – which our model shows is inconsistent with our main results being driven by parental income rather than parental education.

Further, we find that a mother's education becomes more important relative to the father when parents get divorced, and also in larger families. Since mothers in larger families spend more time with kids relative to fathers, but do not increase their labor supply, this pattern is once again inconsistent with our findings being driven by a dominant role for parental income rather than the quality of parenting as proxied by parental education.

Although we use a completely different empirical strategy, our results are consistent with recent evidence that parental education plays an important role on child test scores and other behaviors. In addition, our findings help reconcile the variation in results across recent studies. Holmlund, Lindahl, and Plug (2011) suggest that different methods produce different results because each method is using variation in a different part of the parental education distribution. Our results indicate that this is indeed the case – we find much stronger effects of parental education in the lower part of the parental

education distribution (less than 12 years of schooling) than the upper part. In addition, we find that parental schooling has a bigger effect on children who are near the borderline of passing the matriculation exam relative to those that are well above the passing threshold.

Across all three sources of variation of parental influence, we find stronger results for girls versus boys and for parents coming from the lower end of the parental education distribution. The similarity of the results across these distinct samples, which collectively cover the entire population, reinforce the causal interpretation of the results and also support the generalizability of these findings.

Guryan, Hurst, and Kearney (2008) show that educated parents spend more time with their children despite the higher opportunity cost of time. Our findings suggest that educated parents are simply more productive in developing the human capital of their children. This result should yield important implications in terms of understanding how married couples allocate their time across various activities, how this is changing over time, and how these trends might be affecting the outcomes of children.

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Table 1: Summary Statistics

	Death of Mother Analysis			Death of Father Analysis		
	Father Alive at age 18			Mother Alive at age 18		
	Mother Did Not Die	Mother Died before 18	Mother Died after 18	Father Did Not Die	Father Died before 18	Father Died after 18
Passed Matriculation Exam	0.60	0.54	0.53	0.61	0.50	0.49
Mother's Education	12.52	11.92	11.88	12.56	11.84	11.58
Father's Education	12.47	12.34	11.97	12.51	11.34	11.55
Mother's Log Income Fixed-Effect	-0.14	-0.15	-0.26	-0.13	-0.32	-0.34
Father's Log Income Fixed-Effect	-0.08	-0.17	-0.23	-0.07	-0.35	-0.38
Number of Siblings	2.29	2.11	2.36	2.28	2.44	2.56
Socioeconomic Index of the Locality	12.57	12.66	12.34	12.60	11.88	11.94
Hebrew Score > 80	0.28	0.26	0.23	0.28	0.21	0.20
Hebrew Score > 70	0.54	0.50	0.46	0.54	0.45	0.43
English Score > 80	0.34	0.33	0.25	0.34	0.28	0.22
English Score > 70	0.57	0.56	0.46	0.58	0.50	0.43
Torah Score > 80	0.27	0.26	0.21	0.28	0.06	0.19
Torah Score > 70	0.47	0.43	0.39	0.47	0.21	0.35
Math Score > 80	0.41	0.39	0.32	0.41	0.34	0.30
Math Score > 70	0.56	0.52	0.44	0.56	0.48	0.42
Child's Age when Parent Died if under 18		12.41			11.91	
Year Parent Died if under 18		1995.14			1994.38	
Live Parent Remarried when Child < 18		0.13			0.03	
Sample Size	616,843	6,173	13,732	597,205	16,414	33,176

Notes: Numbers represent means of the variable in the row. The sample includes native born Israeli Jews who were not in the religious school system that were born between 1974 and 1991 (i.e. in the 1992 to 2009 12th grade cohorts).

Table 2: Descriptive Regressions for Individuals that Did Not Suffer Parental Loss

Dependent Variable: Pass Matriculation Exam

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Mother's Education	0.0438***		0.0260***	0.0203***	0.0183***				0.0150***	0.0143***
	(0.0002)		(0.0003)	(0.0003)	(0.0003)				(0.0003)	(0.0003)
Father's Education		0.0417***	0.0259***	0.0187***	0.0171***				0.0138***	0.0131***
		(0.0002)	(0.0003)	(0.0003)	(0.0003)				(0.0003)	(0.0003)
Mother's Log Income Fixed-Effect						0.0772***	0.0535***	0.0529***	0.0320***	0.0331***
						(0.0007)	(0.0007)	(0.0008)	(0.0008)	(0.0009)
Father's Log Income Fixed-Effect						0.0724***	0.0497***	0.0559***	0.0358***	0.0377***
						(0.0007)	(0.0006)	(0.0008)	(0.0008)	(0.0009)
Mother's Income was Zero						-0.0588***	-0.0417***	-0.0377***	-0.0181***	
						(0.0016)	(0.0015)	(0.0016)	(0.0017)	
Father's Income was Zero						-0.0297***	-0.0221***	-0.0234***	-0.0132***	
						(0.0016)	(0.0015)	(0.0016)	(0.0017)	
Socioeconomic Index for Locality					0.0080***			0.0107***	0.0066***	0.0061***
					(0.0002)			(0.0002)	(0.0002)	(0.0002)
Number of School Fixed Effects				850	847		851	848	847	843
Sample Restriction										Non-Missing Wages for Both Parents
Observations	679,076	679,076	679,076	679,075	585,207	688,241	688,240	593,277	585,207	454,210

Notes: Standard errors appear in parentheses. Significance levels are indicated by one, two, or three stars which represent 10 percent, 5 percent, and 1 percent levels, respectively. All regressions are performed using OLS and include controls for mother's age at the time of the child's birth, father's age at the time of the child's birth, gender, number of siblings, birth order, and dummy variables for each cohort year.

Table 3: Comparing Students Who Lost a Parent to Those That Did Not

	Dependent Variable: Pass Matriculation Exam					
	Did Not Lose a Parent		Lost Mother Before Age 18		Lost Father Before Age 18	
	(1)	(2)	(3)	(4)	(5)	(6)
Mother's Education	0.0183***		0.0094***		0.0218***	
	(0.0003)		(0.0027)		(0.0016)	
Father's Education	0.0170***		0.0190***		0.0092***	
	(0.0003)		(0.0027)		(0.0015)	
Mother's Log Income Fixed-Effect		0.0528***		0.0048		0.0495***
		(0.0008)		(0.0060)		(0.0043)
Father's Log Income Fixed-Effect		0.0554***		0.0658***		0.0164***
		(0.0008)		(0.0079)		(0.0039)
Mother's Income was Zero		-0.0390***		-0.0335***		-0.0619***
		(0.0016)		(0.0127)		(0.0086)
Father's Income was Zero		-0.0234***		-0.0353**		-0.0422***
		(0.0016)		(0.0151)		(0.0074)
Socioeconomic Index for Locality	0.0081***	0.0108***	0.0124***	0.0148***	0.0093***	0.0125***
	(0.0002)	(0.0002)	(0.0021)	(0.0019)	(0.0012)	(0.0011)
Number of School Fixed Effects	847	848	486	499	589	617
Observations	597102	605658	5689	6285	15817	17899

Notes: Standard errors appear in parentheses. Significance levels are indicated by one, two, or three stars which represent 10 percent, 5 percent, and 1 percent levels, respectively. All regressions are performed using OLS and include controls for mother's age at the time of the child's birth, father's age at the time of the child's birth, gender, number of siblings, birth order, and dummy variables for each cohort year.

Table 4: Mother Loss Analysis - The Effect of Losing a Mother and the Interaction with Parental Education

Dependent Variable: Pass Matriculation Exam

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mother Died	-0.0382***	-0.0247***	-0.0238***	-0.0238***	-0.0382***	-0.0247***	-0.0238***	-0.0238***
	(0.0038)	(0.0035)	(0.0037)	(0.0037)	(0.0038)	(0.0035)	(0.0037)	(0.0037)
Mother Died when Child < 18	0.0021	0.0287	0.032	-0.0322***	0.1536**	0.1647***	0.1635**	0.0175
	(0.0245)	(0.0228)	(0.0241)	(0.0065)	(0.0658)	(0.0612)	(0.0652)	(0.0156)
Mother's Education	0.0260***	0.0203***	0.0182***	0.0182***	0.0260***	0.0203***	0.0182***	0.0182***
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Father's Education	0.0262***	0.0189***	0.0171***	0.0171***	0.0262***	0.0189***	0.0171***	0.0171***
	(0.0003)	(0.0002)	(0.0003)	(0.0003)	(0.0003)	(0.0002)	(0.0003)	(0.0003)
Socioeconomic Index for Locality			0.0082***	0.0082***			0.0082***	0.0082***
			(0.0002)	(0.0002)			(0.0002)	(0.0002)
Mother Died when Child < 18 interacted with:								
Mother's Education	-0.0056**	-0.0079***	-0.0073***		-0.0287***	-0.0270***	-0.0246***	
	(0.0023)	(0.0021)	(0.0023)		(0.0056)	(0.0052)	(0.0056)	
Father's Education	0.0027	0.0029	0.002		0.0166***	0.0143***	0.0125**	
	(0.0023)	(0.0021)	(0.0022)		(0.0058)	(0.0054)	(0.0058)	
Mother's Educ*Age of Child when Mother Died					0.0021***	0.0017***	0.0016***	
					(0.0005)	(0.0004)	(0.0004)	
Father's Educ*Age of Child when Mother Died					-0.0013***	-0.0011**	-0.0010**	
					(0.0005)	(0.0004)	(0.0004)	
Mother's Educ - Father's Educ				-0.0046**				-0.0195***
				(0.0020)				(0.0051)
(Mother's Educ - Father's Educ)*Age of Child when Mother Died								0.0014***
								(0.0004)
Age of Child when Mother Died					-0.0130***	-0.0116**	-0.0112**	-0.0041***
					(0.0050)	(0.0046)	(0.0049)	(0.0011)
Number of School Fixed Effects		852	849	849		852	849	849
Observations	737,253	737,252	636,748	636,748	737,253	737,252	636,748	636,748

Notes: Standard errors appear in parentheses. Significance levels are indicated by one, two, or three stars which represent 10 percent, 5 percent, and 1 percent levels, respectively. All regressions are performed using OLS and include controls for mother's age at the time of the child's birth, father's age at the time of the child's birth, gender, number of siblings, birth order, and dummy variables for each cohort year. The sample is restricted to children that did not lose a father up to the age of 18. The first three columns include a dummy variable for losing a mother, a dummy for losing a mother before the age of 18, and interactions between losing a mother before 18 with the education level of each parent. The fourth column includes an interaction between the difference in each parent's education with losing a mother before age 18, instead of interactions with each parent's education. The right panel includes interactions between losing a mother before 18, each parent's education, and the age of the child when the mother died before the age of 18.

Table 5: Mother Loss Analysis within Subgroups of Students who Lost a Mother

Dependent Variable : Pass Matriculation Exam

	All	Dad Not Remarried	Boys	Girls	Mom Less than HS	Mom At Least HS Grad	Mother Less Educated than Father	Mother Equally or More Educated than Father	2 or Less Siblings	More than 2 Siblings
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Mother Died when Child < 18 interacted with										
Mother's Education	-0.0233***	-0.0260***	-0.0156*	-0.0296***	-0.0327***	-0.0185*	-0.0359***	-0.0172	-0.0248***	-0.0127
	(0.0060)	(0.0076)	(0.0090)	(0.0083)	(0.0112)	(0.0105)	(0.0105)	(0.0132)	(0.0068)	(0.0138)
Father's Education	0.0129**	0.012	0.007	0.0199**	0.0271**	0.0072	0.0195*	0.0166	0.0121*	0.0129
	(0.0062)	(0.0076)	(0.0095)	(0.0084)	(0.0110)	(0.0079)	(0.0106)	(0.0147)	(0.0070)	(0.0152)
Mother's Educ*Age of Child when Mother Died	0.0015***	0.0018***	0.0010	0.0022***	0.0021**	0.0013*	0.0018**	0.0017*	0.0016***	0.001
	(0.0005)	(0.0005)	(0.0007)	(0.0006)	(0.0009)	(0.0008)	(0.0008)	(0.0010)	(0.0005)	(0.0010)
Father's Educ*Age of Child when Mother Died	-0.0009*	-0.0009*	-0.0003	-0.0016***	-0.0020**	-0.0005	-0.0009	-0.0018*	-0.0008	-0.0009
	(0.0005)	(0.0005)	(0.0007)	(0.0006)	(0.0008)	(0.0006)	(0.0008)	(0.0011)	(0.0005)	(0.0011)
Number of School Fixed Effects	651	646	564	563	554	564	522	595	591	520
Observations	19905	18936	9584	10321	8515	11390	7383	12522	13170	6735
Mother's Educ - Father's Educ	-0.0185***	-0.0191***	-0.0118	-0.0249***	-0.0298***	-0.01	-0.0280***	-0.0171	-0.0188***	-0.0128
	(0.0054)	(0.0068)	(0.0083)	(0.0074)	(0.0088)	(0.0076)	(0.0098)	(0.0131)	(0.0061)	(0.0130)
(Mother's Educ - Father's Educ)*Age of Child when Mother Died	0.0012***	0.0014***	0.0007	0.0019***	0.0021***	0.0007	0.0014*	0.0018*	0.0013***	0.0009
	(0.0004)	(0.0005)	(0.0006)	(0.0006)	(0.0007)	(0.0006)	(0.0008)	(0.0009)	(0.0005)	(0.0009)
Number of School Fixed Effects	651	646	564	563	554	564	522	595	591	520
Observations	19905	18936	9584	10321	8515	11390	7383	12522	13170	6735

Notes: For every column, the upper and lower panels represent separate regressions. The sample is restricted to individuals who lost a mother. Standard errors appear in parentheses. Significance levels are indicated by one, two, or three stars which represent 10 percent, 5 percent, and 1 percent levels, respectively. All regressions are performed using OLS and include controls for mother's age at the time of the child's birth, father's age at the time of the child's birth, gender, number of siblings, birth order, and dummy variables for each cohort year. All specifications also control for socioeconomic status of the locality, a dummy for whether the mother died before age 18, age mother died, education of the mother, and education of the father.

Table 6: Placebo Analysis using those that Lost a Parent Above the Age of 18

	Child Passed Matriculation Exam at 18			
	Children Who Lost a Mother after Age 18		Children Who Lost a Father after Age 18	
	(1)	(2)	(3)	(4)
Mother's Education	0.0234***	0.0226**	0.0207***	0.0092
	(0.0021)	(0.0107)	(0.0013)	(0.0065)
Father's Education	0.0240***	0.0129	0.0234***	0.0122*
	(0.0020)	(0.0102)	(0.0012)	(0.0062)
Mother's Educ*Age of Child when Parent Died		-0.0002		0.0002
		(0.0004)		(0.0002)
Father's Educ*Age of Child when Parent Died		0.0001		0.0002
		(0.0004)		(0.0002)
Age of Child When Parent Died		-0.0008		-0.0042*
		(0.0038)		(0.0022)
Number of schoolid		581		698
Observations	11895	11895	31334	31334

Notes: The sample is restricted to individuals who lost a mother after the age of 18 (left panel) or lost a father after the age of 18 (right panel). Standard errors appear in parentheses. Significance levels are indicated by one, two, or three stars which represent 10 percent, 5 percent, and 1 percent levels, respectively. All regressions are performed using OLS and include controls for mother's age at the time of the child's birth, father's age at the time of the child's birth, gender, number of siblings, birth order, and dummy variables for each cohort year. All specifications also control for socioeconomic status of the locality, a dummy for whether the mother died before age 18, age mother died, education of the mother, and education of the father.

Table 7: Father Loss Analysis - The Effect of Losing a Father and the Interaction with Parental Education

	Dependent Variable: Pass Matriculation Exam							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Father Died	-0.0529***	-0.0362***	-0.0309***	-0.0310***	-0.0529***	-0.0362***	-0.0309***	-0.0310***
	(0.0025)	(0.0023)	(0.0024)	(0.0024)	(0.0025)	(0.0023)	(0.0024)	(0.0024)
Father Died when Child < 18	0.001	0.0206	0.019	-0.0275***	0.0755**	0.0825**	0.0781**	-0.0125
	(0.0151)	(0.0140)	(0.0148)	(0.0041)	(0.0376)	(0.0350)	(0.0367)	(0.0090)
Mother's Education	0.0260***	0.0202***	0.0182***	0.0182***	0.0260***	0.0202***	0.0182***	0.0182***
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Father's Education	0.0260***	0.0188***	0.0170***	0.0170***	0.0260***	0.0188***	0.0170***	0.0170***
	(0.0003)	(0.0002)	(0.0003)	(0.0003)	(0.0003)	(0.0002)	(0.0003)	(0.0003)
Socioeconomic Index for Locality			0.0082***	0.0082***			0.0082***	0.0082***
			(0.0002)	(0.0002)				(0.0002)
Father Died when Child < 18 interacted with:								
Mother's Education	0.0052***	0.0030**	0.0032**		0.0070**	0.0043	0.0052	
	(0.0015)	(0.0014)	(0.0015)		(0.0035)	(0.0032)	(0.0034)	
Father's Education	-0.0073***	-0.0068***	-0.0072***		-0.0138***	-0.0122***	-0.0129***	
	(0.0014)	(0.0013)	(0.0014)		(0.0032)	(0.0030)	(0.0031)	
Mother's Educ*Age of Child when Father Died					-0.0002	-0.0002	-0.0002	
					(0.0003)	(0.0003)	(0.0003)	
Father's Educ*Age of Child when Father Died					0.0006**	0.0005**	0.0005**	
					(0.0003)	(0.0002)	(0.0003)	
Mother's Educ - Father's Educ				0.0056***				0.0100***
				(0.0013)				(0.0029)
(Mother's Educ - Father's Educ)*Age of Child when Father Died								-0.0004*
								(0.0002)
Age of Child when Father Died					-0.0063**	-0.0052*	-0.0050*	
					(0.0029)	(0.0027)	(0.0028)	
Number of School Fixed Effects		851	848	848		851	848	848
Observations	748,496	748,495	646,795	646,795	748,496	748,495	646,795	646,795

Notes: Standard errors appear in parentheses. Significance levels are indicated by one, two, or three stars which represent 10 percent, 5 percent, and 1 percent levels, respectively. All regressions are performed using OLS and include controls for mother's age at the time of the child's birth, father's age at the time of the child's birth, gender, number of siblings, birth order, and dummy variables for each cohort year. The sample is restricted to children that did not lose a mother up to the age of 18. The first three columns include a dummy variable for losing a father, a dummy for losing a father before the age of 18, and interactions between losing a father before 18 with the education level of each parent. The fourth column includes an interaction between the difference in each parent's education with losing a father before age 18, instead of interactions with each parent's education. The right panel includes interactions between losing a father before 18, each parent's education, and the age of the child when the father died before the age of 18.

Table 8: Father Loss Analysis within Subgroups of Students who Lost a Father

Dependent Variable: Pass Matriculation Exam

Father Died when Child < 18 interacted with:	All	Mom Not Remarried	Boys	Girls	Dad Less than HS	Dad At Least HS Grad	Mother Less Educated than Father	Mother Equally or More Educated than Father	2 or Less Siblings	More than 2 Siblings
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Mother's Education	0.0073**	0.0077**	0.0094*	0.0072	0.0146***	0.0007	0.0076	0.007	0.0043	0.0169***
	(0.0037)	(0.0039)	(0.0052)	(0.0052)	(0.0053)	(0.0053)	(0.0107)	(0.0049)	(0.0047)	(0.0062)
Father's Education	-0.0137***	-0.0145***	-0.0133***	-0.0153***	-0.0072	-0.0059	-0.0088	-0.0145***	-0.0146***	-0.0083
	(0.0034)	(0.0035)	(0.0049)	(0.0047)	(0.0057)	(0.0064)	(0.0100)	(0.0048)	(0.0041)	(0.0060)
Mother's Educ*Age of Child when Father Died	-0.0002	-0.0002	-0.0002	-0.0004	-0.0010**	0.0003	-0.0004	0.0000	-0.0001	-0.0007
	(0.0003)	(0.0003)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0008)	(0.0004)	(0.0004)	(0.0005)
Father's Educ*Age of Child when Father Died	0.0006**	0.0007***	0.0006	0.0009**	0.0000	0.0000	0.0002	0.0007*	0.0008***	0.0000
	(0.0003)	(0.0003)	(0.0004)	(0.0004)	(0.0005)	(0.0005)	(0.0007)	(0.0004)	(0.0003)	(0.0005)
Number of School Fixed Effects	749	747	656	675	672	655	604	709	686	650
Observations	49590	48600	23254	26336	25029	24561	15443	34147	29528	20062
Mother's Educ - Father's Educ	0.0112***	0.0118***	0.0117***	0.0123***	0.0112**	0.0024	0.0084	0.0111**	0.0111***	0.0123**
	(0.0031)	(0.0033)	(0.0045)	(0.0043)	(0.0045)	(0.0049)	(0.0099)	(0.0044)	(0.0038)	(0.0054)
(Mother's Educ - Father's Educ)*Age of Child when Father Died	-0.0005**	-0.0005**	-0.0004	-0.0007**	-0.0006*	0.0002	-0.0003	-0.0004	-0.0006**	-0.0003
	(0.0002)	(0.0003)	(0.0004)	(0.0003)	(0.0004)	(0.0004)	(0.0007)	(0.0004)	(0.0003)	(0.0004)
Number of School Fixed Effects	749	747	656	675	672	655	604	709	686	650
Observations	49590	48600	23254	26336	25029	24561	15443	34147	29528	20062

Notes: For every column, the upper and lower panels represent separate regressions. The sample is restricted to individuals who lost a father. Standard errors appear in parentheses. Significance levels are indicated by one, two, or three stars which represent 10 percent, 5 percent, and 1 percent levels, respectively. All regressions are performed using OLS and include controls for mother's age at the time of the child's birth, father's age at the time of the child's birth, gender, number of siblings, birth order, and dummy variables for each cohort year. All specifications also control for socioeconomic status of the locality, a dummy for whether the parent died before age 18, age parent died, education of the mother, and education of the father.

Table 9: The Effect of Parental Education on Child Education According to Parental Divorce Status

	Child Passed Matriculation Exams												
	All	Parents Divorced at Age < 18	Parents Not Divorced at Age < 18	All				Boy	Girl	Mother < 12 Educ	Mother > 12 Educ	Mother More or Equally Educated	Father More Educated
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Mother's Education	0.0265***	0.0288***	0.0261***	0.0262***	0.0236***	0.0185***	0.0185***	0.0191***	0.0179***	0.0052***	0.0158***	0.0202***	0.0184***
	(0.0003)	(0.0008)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0004)	(0.0004)	(0.0008)	(0.0004)	(0.0005)	(0.0007)
Father's Education	0.0248***	0.0232***	0.0250***	0.0251***	0.0220***	0.0166***	0.0166***	0.0182***	0.0148***	0.0163***	0.0168***	0.0139***	0.0175***
	(0.0003)	(0.0008)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0004)	(0.0004)	(0.0006)	(0.0003)	(0.0005)	(0.0006)
(Mother's Educ - Father's Educ)*Parents Divorced at Age < 18				0.0021***	0.0021***	0.0019***	0.0027*	0.0015	0.0022**	0.0055***	0.0026***	0.0027**	-0.0013
				(0.0007)	(0.0008)	(0.0007)	(0.0016)	(0.0011)	(0.0010)	(0.0017)	(0.0008)	(0.0012)	(0.0018)
(Mother's Educ - Father's Educ)*Age of Child when Parents Divorced if under Age 18							-0.0001						
							(0.0001)						
Parents Divorced	-0.0698***		-0.0703***	-0.1208***	-0.1126***	-0.0725***	-0.0729***	-0.0720***	-0.0732***	-0.0611***	-0.0698***	-0.0674***	-0.0881***
	(0.0023)		(0.0023)	(0.0073)	(0.0079)	(0.0073)	(0.0074)	(0.0108)	(0.0099)	(0.0139)	(0.0085)	(0.0088)	(0.0132)
Parents Divorced at Age < 18	-0.0501***			-0.0233***	-0.0261***	-0.0233***	-0.0230***	-0.0198***	-0.0263***	-0.0169*	-0.0262***	-0.0288***	-0.0184**
	(0.0028)			(0.0047)	(0.0050)	(0.0047)	(0.0047)	(0.0069)	(0.0063)	(0.0089)	(0.0054)	(0.0058)	(0.0092)
Age Parents Divorced if Age was < 18				0.0022***	0.0018***	0.0009***	0.0009***	0.0009**	0.0008**	0.0006	0.0007*	0.0008**	0.0012**
				(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0004)	(0.0004)	(0.0005)	(0.0003)	(0.0004)	(0.0005)
Socioeconomic Index for Locality					0.0109***	0.0079***	0.0079***	0.0078***	0.0079***	0.0074***	0.0070***	0.0082***	0.0073***
					(0.0002)	(0.0002)	(0.0002)	(0.0003)	(0.0003)	(0.0004)	(0.0002)	(0.0002)	(0.0003)
Number of School Fixed-Effects						853	853	840	828	824	843	848	833
Observations	677,096	77,783	599,313	677,096	583,528	583,528	583,528	285,029	298,499	186,096	397,432	390,886	192,642

Notes: The sample is restricted to individuals who did not lose a parent and did not have parents that divorced. Significance levels are indicated by one, two, or three stars which represent 10 percent, 5 percent, and 1 percent levels, respectively. All regressions are performed using OLS and include controls for mother's year of birth, mother's age at the time of the child's birth, father's age at the time of the child's birth, gender, number of siblings, birth order, and dummy variables for each cohort year.

Table 10: The Effect of Parental Education on Child Education According to Family Size

	Child Passed Matriculation Exams											
	Number of Siblings <=2	Number of Siblings>2	All				Boys	Girls	Mom Less than HS	Mom At Least HS Grad	Mother Equally or More Educated than Father	Mother Less Educated than Father
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Mother's Education	0.0238***	0.0311***	0.0179***	0.0160***	0.0121***	0.0087***	0.0106***	0.0068***	-0.0022	0.0060***	0.0083***	0.0125***
	(0.0004)	(0.0006)	(0.0008)	(0.0008)	(0.0008)	(0.0008)	(0.0012)	(0.0011)	(0.0022)	(0.0010)	(0.0013)	(0.0017)
Father's Education	0.0250***	0.0259***	0.0232***	0.0198***	0.0194***	0.0147***	0.0169***	0.0124***	0.0226***	0.0118***	0.0154***	0.0103***
	(0.0004)	(0.0006)	(0.0007)	(0.0008)	(0.0008)	(0.0007)	(0.0011)	(0.0010)	(0.0017)	(0.0009)	(0.0014)	(0.0015)
Number of Siblings	0.1106***	-0.0370***	-0.0705***	-0.0655***	-0.0635***	-0.0574***	-0.0524***	-0.0630***	-0.0227***	-0.0679***	-0.0498***	-0.0733***
	(0.0102)	(0.0051)	(0.0039)	(0.0042)	(0.0042)	(0.0040)	(0.0058)	(0.0055)	(0.0076)	(0.0063)	(0.0051)	(0.0065)
Number of Siblings Squared	-0.0366***	0.0005	-0.0030***	-0.0030***	-0.0030***	-0.0015***	-0.0011***	-0.0019***	-0.0006	-0.0032***	-0.0018***	-0.0010**
	(0.0036)	(0.0005)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0005)
Mother's Educ*Number of Siblings			0.0038***	0.0036***	0.0036***	0.0033***	0.0027***	0.0038***	0.0029***	0.0035***	0.0044***	0.0015**
			(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0005)	(0.0004)	(0.0007)	(0.0005)	(0.0005)	(0.0007)
Father's Educ*Number of Siblings			0.0010***	0.0013***	0.0013***	0.0010***	0.0009*	0.0012***	-0.0019***	0.0023***	-0.0007	0.0033***
			(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0005)	(0.0004)	(0.0006)	(0.0004)	(0.0006)	(0.0006)
Socioeconomic Index for Locality				0.0106***	0.0097***	0.0073***	0.0073***	0.0073***	0.0067***	0.0066***	0.0078***	0.0064***
				(0.0002)	(0.0002)	(0.0002)	(0.0003)	(0.0003)	(0.0004)	(0.0003)	(0.0003)	(0.0004)
Log Total Family Income 1988-1989					0.0219***	0.0164***	0.0164***	0.0165***	0.0147***	0.0146***	0.0168***	0.0156***
					(0.0005)	(0.0005)	(0.0007)	(0.0006)	(0.0008)	(0.0005)	(0.0006)	(0.0007)
Sample Restriction												
Number of School Fixed-Effects						848	834	816	812	831	837	819
Observations	330,128	192,307	522,435	451,272	451,272	451,272	222,463	228,809	143,766	307,506	299,553	151,719
Mother's Education	0.0238***	0.0311***	0.0243***	0.0222***	0.0183***	0.0141***	0.0152***	0.0130***	-0.0004	0.0145***	0.0102***	0.0210***
	(0.0004)	(0.0006)	(0.0007)	(0.0008)	(0.0008)	(0.0007)	(0.0010)	(0.0010)	(0.0017)	(0.0008)	(0.0013)	(0.0016)
Father's Education	0.0250***	0.0259***	0.0277***	0.0242***	0.0238***	0.0186***	0.0201***	0.0171***	0.0234***	0.0149***	0.0216***	0.0126***
	(0.0004)	(0.0006)	(0.0007)	(0.0008)	(0.0008)	(0.0007)	(0.0010)	(0.0010)	(0.0016)	(0.0008)	(0.0013)	(0.0015)
Number of Siblings	0.1106***	-0.0370***	-0.0030*	0.0014	0.0035*	0.0016	-0.0033	0.0060**	-0.0124***	0.0134***	-0.0004	-0.0078**
	(0.0102)	(0.0051)	(0.0018)	(0.0019)	(0.0019)	(0.0018)	(0.0026)	(0.0024)	(0.0031)	(0.0024)	(0.0024)	(0.0032)
Number of Siblings Squared	-0.0366***	0.0005	-0.0044***	-0.0044***	-0.0044***	-0.0029***	-0.0021***	-0.0036***	-0.0006	-0.0040***	-0.0029***	-0.0025***
	(0.0036)	(0.0005)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)
(Mother's Educ - Father's Educ)*Number of Siblings			0.0010***	0.0008**	0.0008**	0.0008***	0.0006	0.0010**	0.0022***	-0.0008**	0.0035***	-0.0022***
			(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0004)	(0.0004)	(0.0005)	(0.0004)	(0.0005)	(0.0006)
Socioeconomic Index for Locality				0.0107***	0.0098***	0.0074***	0.0074***	0.0074***	0.0067***	0.0067***	0.0078***	0.0066***
				(0.0002)	(0.0002)	(0.0002)	(0.0003)	(0.0003)	(0.0004)	(0.0003)	(0.0003)	(0.0004)
Log Total Family Income 1988-1989					0.0219***	0.0164***	0.0164***	0.0164***	0.0146***	0.0148***	0.0168***	0.0156***
					(0.0005)	(0.0005)	(0.0007)	(0.0006)	(0.0008)	(0.0005)	(0.0006)	(0.0007)
Number of School Fixed-Effects						848	834	816	812	831	837	819
Observations	330,128	192,307	522,435	451,272	451,272	451,272	222,463	228,809	143,766	307,506	299,553	151,719

Notes: For every column, the upper and lower panels represent separate regressions. The sample is restricted to individuals who did not lose a parent and did not have divorced parents. Significance levels are indicated by one, two, or three stars which represent 10 percent, 5 percent, and 1 percent levels, respectively. All regressions are performed using OLS and include controls for mother's age at the time of the child's birth, father's age at the time of the child's birth, gender, number of siblings, birth order, and dummy variables for each cohort year.

Table 11: The Allocation of Parental Time with Children and Family Size

	Works Full-Time	Works Full or Part-Time	Time with Kids	Works Full-Time	Works Full or Part-Time	Time with Kids
	(1)	(2)	(3)	(4)	(5)	(6)
Age	0.042***	0.053***	-5.004	0.042***	0.053***	-5.071
	(0.011)	(0.011)	(4.176)	(0.011)	(0.011)	(4.178)
Age Squared	-0.001***	-0.001***	0.064	-0.001***	-0.001***	0.064
	(0.000)	(0.000)	(0.050)	(0.000)	(0.000)	(0.050)
Number of Kids	-0.058***	-0.050***	-7.513	-0.026	-0.120**	-10.362
	(0.015)	(0.014)	(5.501)	(0.054)	(0.051)	(19.895)
Female	-0.883***	-0.822***	-47.542	-0.858***	-0.615***	-6.676
	(0.133)	(0.126)	(48.644)	(0.217)	(0.204)	(79.492)
Female*Number of Kids	-0.004	-0.022	22.532***	-0.013	-0.120*	4.098
	(0.019)	(0.018)	(6.955)	(0.075)	(0.071)	(27.590)
Education	0.004	0.012*	5.650**	0.011	-0.004	4.962
	(0.007)	(0.007)	(2.523)	(0.014)	(0.013)	(5.009)
Female*Education	0.033***	0.049***	9.143***	0.031	0.028	5.125
	(0.009)	(0.009)	(3.473)	(0.019)	(0.018)	(6.874)
Education*Number of Kids				-0.003	0.007	0.285
				(0.005)	(0.005)	(1.829)
Female*Education*Number of Kids				0.001	0.010	1.868
				(0.007)	(0.007)	(2.615)
Fixed-Effects for Age of Youngest Child	Yes	Yes	Yes	Yes	Yes	Yes
Fixed-Effects for Day of the Week	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,131	1,131	1,131	1,131	1,131	1,131
Mean of the Dependent Variable	0.567	0.714	123.27			

Notes: Sample includes all married adults below the age of 60 from the Israel Time Budget Survey 1991/1992. Standard errors appear in parentheses. Significance levels are indicated by one, two, or three stars which represent 10 percent, 5 percent, and 1 percent levels, respectively. Time with children includes the following categories: "Taking care of babies/children (physical care)", "Helping children with homework/studies", "Reading to children", "Playing with the children", "Watching TV with the children," "Other (including conversations with children)", "Driving (walking) related to childcare."

Table 12: The Effect of Parental Education on Mother's Labor Force Participation According to Family Size

	Mother Working Full-Time Throughout 1988-1989											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Mother's Education	0.0370***	0.0287***	0.0374***	0.0362***	0.0355***	0.0357***	0.0376***	0.0379***	0.0365***	0.0448***	0.0441***	0.0399***
	(0.0009)	(0.0033)	(0.0034)	(0.0035)	(0.0034)	(0.0036)	(0.0035)	(0.0035)	(0.0036)	(0.0036)	(0.0036)	(0.0036)
Father's Education	-0.0002	0.0070**	0.0014	0.0037	0.0032	0.0046	-0.0007	0.0004	0.0003	-0.0071**	-0.0056	-0.0036
	(0.0009)	(0.0033)	(0.0034)	(0.0035)	(0.0033)	(0.0035)	(0.0034)	(0.0035)	(0.0035)	(0.0035)	(0.0036)	(0.0035)
Number of Siblings	-0.0477***	0.0204**	0.0180**	-0.0237***	-0.0432***	-0.0452***	-0.0234***	-0.0318***	-0.0505***	-0.0610***	-0.0690***	-0.0688***
	(0.0022)	(0.0087)	(0.0087)	(0.0089)	(0.0085)	(0.0089)	(0.0090)	(0.0092)	(0.0088)	(0.0088)	(0.0087)	(0.0096)
Number of Siblings Squared	-0.0009***	-0.0058***	-0.0051***	-0.0027*	-0.0013	-0.0007	-0.0042***	-0.0042***	-0.0019	-0.0006	0.0013	0.0009
	(0.0004)	(0.0014)	(0.0014)	(0.0015)	(0.0013)	(0.0015)	(0.0015)	(0.0015)	(0.0014)	(0.0015)	(0.0014)	(0.0016)
(Mother's Educ - Father's Educ)*Number of Siblings	-0.0001	0.0014	-0.0007	0.0013	0.0005	0.0006	-0.0001	0.0016	0.0003	-0.0031**	-0.0014	-0.0014
	(0.0004)	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0015)	(0.0014)
Year of Birth Sample Restriction	None	1988	1987	1986	1985	1984	1983	1982	1981	1980	1979	1978
Number of School Fixed-Effects	835	433	441	442	434	429	411	388	363	353	350	629
Observations	377,322	26,634	26,704	27,166	27,545	26,821	27,336	26,343	25,533	25,221	24,131	23,602
	Mother Working Full Time Throughout 1988-1990											
Mother's Education	0.0344***	0.0263***	0.0352***	0.0336***	0.0355***	0.0326***	0.0327***	0.0334***	0.0339***	0.0406***	0.0423***	0.0382***
	(0.0009)	(0.0033)	(0.0034)	(0.0035)	(0.0034)	(0.0035)	(0.0035)	(0.0035)	(0.0036)	(0.0036)	(0.0036)	(0.0036)
Father's Education	-0.0011	0.0059*	0.0001	0.0019	-0.0016	0.0042	0.0014	0.0008	-0.0005	-0.0066*	-0.0068*	-0.0046
	(0.0009)	(0.0032)	(0.0033)	(0.0034)	(0.0033)	(0.0035)	(0.0034)	(0.0035)	(0.0035)	(0.0035)	(0.0036)	(0.0035)
Number of Siblings	-0.0527***	0.0102	0.0046	-0.0313***	-0.0460***	-0.0484***	-0.0317***	-0.0458***	-0.0525***	-0.0712***	-0.0719***	-0.0716***
	(0.0022)	(0.0085)	(0.0085)	(0.0088)	(0.0084)	(0.0088)	(0.0090)	(0.0091)	(0.0088)	(0.0088)	(0.0087)	(0.0096)
Number of Siblings Squared	-0.0003	-0.0047***	-0.0034**	-0.0019	-0.0008	-0.0002	-0.0035**	-0.0023	-0.0016	0.001	0.0017	0.0012
	(0.0004)	(0.0014)	(0.0014)	(0.0015)	(0.0013)	(0.0015)	(0.0015)	(0.0015)	(0.0014)	(0.0015)	(0.0014)	(0.0016)
(Mother's Educ - Father's Educ)*Number of Siblings	0	0.0014	-0.0008	0.0012	-0.0003	0.0012	0.001	0.0022	0.0007	-0.0027*	-0.0015	-0.0017
	(0.0004)	(0.0013)	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0015)	(0.0014)
Year of Birth Sample Restriction	None	1988	1987	1986	1985	1984	1983	1982	1981	1980	1979	1978
Number of School Fixed-Effects	835	433	441	442	434	429	411	388	363	353	350	629
Observations	377,322	26,634	26,704	27,166	27,545	26,821	27,336	26,343	25,533	25,221	24,131	23,602

Notes: For every column, the upper and lower panels represent separate regressions. The mean of the dependent variable in the upper panel of column 1 is 0.4853. The sample is restricted to individuals who did not lose a parent and did not have divorced parents. Significance levels are indicated by one, two, or three stars which represent 10 percent, 5 percent, and 1 percent levels, respectively. All regressions are performed using OLS and include controls for mother's year of birth, mother's age at the time of the child's birth, father's age at the time of the child's birth, gender, number of siblings, birth order, and dummy variables for each cohort year.