Schooling and Parental Death

By

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Loss of a parent is one of the most traumatic events a child can face. If loss of a parent reduces investments in children, it can also have long-lasting implications on efficiency. This study uses parametric and semi-non-parametric matching techniques to estimate how one human capital investment, school enrollment, is affected by a parent's recent death. We analyze data from 600,000 households from Indonesia's National Socioeconomic Survey (SUSENAS) during 1994-96. We find a parent's recent death has a large effect a child's enrollment. We also use this shock to test several theories of intra-household allocation, finding little support for theories of differences between fathers and mothers, between sons and daughters, or their interaction.

Social scientists have studied how families react to an array of bad news ranging from illness and bad harvests to job loss and tax increases. While each of these is somewhat random, one piece of bad news arrives with certainty – the loss of a parent. At the same time, for most people this inevitable tragedy occurs after the child is an adult. In this paper we study how loss of a parent affects school-aged children in Indonesia.

A significant proportion of school-aged children in less industrialized nations have always lost parents to accidents, childbirth, and illness. Unfortunately, in much of the world the scourge of HIV/AIDS has greatly increased death rates of young adults and, thus, increased the importance of understanding how parental loss affects investments in children.

If the world were perfectly efficient, investments in children would be carried out whenever they had a positive present value. Thus, shocks to parental income, for example would not affect investments in children because the family's savings, its borrowing, or formal and informal insurance payments would permit efficient investments. In fact, as the literature reviewed below indicates, investments in children such as education often decline after family income declines and after a family loses a parent.

Indonesia is an important case study as formal insurance and social insurance mechanisms are lacking for the vast majority of the population. Like other research on the effects of family composition and income changes, this study carefully treats the problem of endogeneity; specifically, in Indonesia families that lose a parent were disadvantaged before the loss of the parent. In addition to a standard parametric technique (conditional logit), we address the problems of nonrandom selection with a semi-nonparametric

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technique that matches youth who lose a parent to similar "control" youth who have similar observable characteristics and live in the same detailed neighborhood.

Theoretical Framework

Theories of intergenerational altruism, mutual insurance, and intra-household allocation all make predictions about how a large shock such as loss of a parent affects investments in children's education.

Intergenerational altruism

The model of investments in children's human capital motivated by intergenerational altruism was analyzed in two seminal papers by Becker and Tomes (1979, 1986). We use their models to analyze the simplest case where loss of a parent leads only to lower financial resources, and where schooling is valued solely for its contributions to future income.

In the first paper (Becker and Tomes 1979), the authors showed that with perfect capital markets, investments in children are unaffected by shocks to a family's current income. Intuitively, parents undertake investments with positive present values, and current income does not affect the payoff from the investment. This set of assumptions implies:

> *Hypothesis 1: Enrollment rates among children who lose a parent are unaffected by the loss of a parent. (For all hypotheses, references to "enrollment" refer to school enrollment adjusted for age.)*

Consistent with this framework, Lloyd and Blanc (1996) find that parental death does not affect children's schooling in sub-Saharan Africa.

Imperfect capital markets

In a follow-up paper, Becker and Tomes (1986) revisit this issue in the presence of imperfect capital markets. When families cannot borrow against future higher earnings that children will typically receive, then after a negative income shock investments in children remain unaffected for families with sufficient assets, but investments decline for families with liquidity constraints. Given the weakness of Indonesia's formal credit and insurance markets mentioned above, this theory suggests:

> *Hypothesis 2: Enrollment rates among children who lose a parent are unaffected if initial assets and post-shock income were high, but decline if both were sufficiently low.*

In many industrialized nations, parents purchase life insurance to help smooth the living standard of and investments in their children if a parent dies. While this mechanism is not widely used in Indonesia, informal insurance from neighbors and the extended family can be important factors in maintaining investments in children (Townsend 1995). Informal insurance can be particularly important when capital markets and formal insurance markets are very imperfect.

The ethnographic literature on Indonesia suggests that informal insurance within neighborhoods was often quite important after a family received a negative shock (e.g., Sullivan 1994). For example, the

traditional Javanese funeral traditionally involves monetary gifts to the family of the deceased. Moreover, meals, childcare, and other resources are often provided by long-time neighbors to help maintain children's well-being. Well-working, if informal, insurance markets also provide a rationale for stable enrollment after loss of a parent, as in hypothesis 1.

At the same time, in formal models of insurance and in the ethnographies of Indonesia, less positive outcomes are possible. Mutual insurance is easiest to maintain if one family's relative bad luck one year is likely to be balanced by relative good luck the next; after a poor harvest, for example. A permanent shock such as the death of a prime-age parent makes such reciprocity less likely to occur. Thus, when insurance is maintained by expected future reciprocity, it will not work well for large shocks (Townsend 1994, Sullivan 1994), which suggests that enrollment would decline.

Intra-household allocation

The theoretical picture becomes even more complex when parental time is considered as additional resource. Widows and widowers have less time to care for children than do parents in intact families. If parental time is a complement to education, then we expect loss of a parent might reduce enrollments. For example, when parents must transport children to school, loss of a parent may reduce enrollments even when capital markets work well.

At the same time parents find their time stretched, the value of children's time outside of school may increase. For example, the ethnographic literature on Indonesia stresses the important role that oldest daughters often play in caring for younger siblings. When a parent dies, the remaining parent is particularly likely to find this assistance useful. Thus, we have:

> *Hypothesis 3: In families that lose a parent, enrollment rates decline the most among oldest daughters who have and are old enough to care for younger siblings*.

Importantly, lower education after loss of a parent is not necessarily inefficient if it is due to the higher value parents put on their own and their children's time. This result is reversed if parental time and education are substitutes – for example, if school attendance frees up parental time from childcare responsibilities.

More generally, in a number of studies from a number of less industrialized nations, daughters tend to bear a disproportionate share of bad shocks. For example, investments in sons are more likely to be protected during famines (Dreze and Sen 1989) and after bad harvests (Rose 1999; Cameron and Worsick 2001) than are investments in daughters.

> *Hypothesis 4: In families that lose a parent, enrollment rates decline more among daughters than among sons.*

If parents try to protect sons, then children (both male and female) with many brothers will be at particularly high risk (Garg and Morduch 1998). Intuitively, in cultures where sons are very important, an only son is privileged, while a sister with many brothers, or a brother with man brothers, is less likely to receive extra protection. This between-sibling competition implies:

Hypothesis 5: Among families that lose a parent, enrollment rates decline more if the proportion of brothers is high (controlling for family size).

At the same time, Indonesia has historically had less unequal treatment of daughters than in most of South or East Asia. Moreover, the gaps in education and inheritance that existed in the 1960s and earlier had largely closed by the 1990s (Kevane and Levine 2001). For example, in a 1997 survey almost half of village elders claimed it was traditionally important to favor sons over daughters in education, while only one in seven claimed such favoritism remained current practice (Kevane and Levine 2001.) Thus, hypotheses 4 and 5 and perhaps 3 might be more relevant in nations with stronger traditions of favoring sons.

Loss of father vs. mother

In Indonesia, men in the wage-earning sector earn substantially more than do women of similar observable qualifications.[2] Moreover, men are more likely to work in the relatively well-paid formal sector than are women.[3] If liquidity constraints are the main constraint on children's education, these labor market inequalities imply that loss of a father should affect education more than loss of a mother.

Working on the other direction, Indonesian mothers do the bulk of childrearing work. These tasks may be important complements to education; for example, consider the time it takes to help a child get dressed, fed, and transported to school. Moreover, there is evidence mothers tend to invest more of the income they control in children than do fathers (Haddad and Hoddinott 1994, Thomas 1997). Finally, in many parts of Indonesia, social support networks are based on the mother, not the father (Geertz 1963, Manderson 1983). These inequalities in traditional time use patterns, preferences and social support imply that, holding all else constant, loss of a mother should affect education more than loss of a father. The relative importance of maternal loss should be highest for elementary school children, when the time it takes to help a child attend school is highest. These predictions are supported by Ainswoth, et. al. (2000), which measures the impact of adult mortality on enrollment in Northwestern Tanzania.

In short, if paternal loss is more important for children's education than is maternal loss, then there is some support for theories of financial constraints. The converse effect, in contrast, supports any of several theories of mothers' roles in rearing children and building ties to social networks.

Literature Review

Empirical evidence supports the prediction that children's outcomes, including educational achievement, are positively correlated with family resources, such as income, education, assets and time. For example, research on children's outcomes in the US has found that parental income has an important positive effect on educational attainment. (Hill and Duncan 1987 and Haveman and Wolfe 1995 review this literature; *contra* see Mayer 1997). Furthermore, studies in this area have also shown that achievement in school is

[2] Source: 1996 Sakernas. A median regression shows women earn 39 percent lower wages than men of similar age and education. (To be precise, the estimate was 0.39 lower log(wages) for women.)
[3] Source: Susenas

positively linked to parental investments of time (Datcher-Loury 1988; Steelman and Mercy 1980; Leibowitz 1974) and parents' education (Haveman and Wolfe 1994).[4]

Evidence from developing countries also supports the link between parent and child educational attainment (Behrman, Foster, Rosenzweig and Vashishtha 1999; Smith and Cheung 1986). In contrast, in developing nations research on the effect of parental investments of time on children's education has been limited by data availability. Instead, several studies have examined the effect of family size, as an inverse proxy for parents' time and other resources, on educational attainment. The majority of these studies (e.g., Knodel et. al. 1990; Anh et. al. 1998; Knodel and Wongsith 1991) found a negative relationship.

Conversely, the shift from two-parent to single-parent status decreases child outcomes for three related reasons. First, these families experience a substantial reduction in income, in particular if the missing parent is deceased (see McLanahan and Sandefur 1994; Cherlin 1992; and McLanahan 1985). In addition, single parents devote less time to their children than married parents do (Robinson 1980; Hetherington 1981), and have lower educational expectations of their children (Entwisle and Alexander 1996; Astone and McLanahan 1991).

The direct effect of parental absence on children's educational outcomes has also been well documented. A number of studies provide evidence that children in single-parent families have lower grades, poorer school attendance, higher dropout rates and more problems with school authorities. Furthermore, divorce (a less severe shock than loss of a parent) also reduces children's future education (Levine and Painter 2000).

As Levine and Painter (2000) point out, however, family structure may not be the cause of poor educational outcomes, but rather school achievement and family structure may be jointly determined by unobservable family characteristics. Because parents that divorce often have other disadvantages, many estimates of the effects of divorce may overstate the true effects. To overcome this problem, in our study we analyze children of single-parent families where one parent has recently died ("bereaved families").

In doing so, we follow the identification strategy of Corak (1999). He compared outcomes of children from intact, divorced and bereaved families and, like us, assumed parental death is not highly correlated with unobserved disadvantages. In his Canadian sample, Corak finds that children from bereaved and intact families have similar labor market outcomes, such as income, earnings, labor market participation and receipt of unemployment assistance.

Background

With a population just over 200 million, Indonesia is the fourth most populous nation in the world. From 1980 until the economic crisis of 1997, Indonesia experienced very rapid economic growth of over 6% per year. Despite the country's rapid increase in wealth, the average Indonesian remained quite poor. Even before the 1997 financial crisis, almost 10 percent of Indonesians lived beneath the poverty line of about $1 per day.

[4] Haveman and Wolfe (1994) found that the single largest determinant of a child's educational achievement is parental education, but that this correlation falls to zero for a parent who is absent from the home.

Indonesia has made substantial improvements in education over the last 20 years. Due partly to school expansion efforts and a compulsory education law passed in 1984, primary enrollment increased from 79 to 95 percent from 1983 to 1999.[5] While the average 50-year old in Indonesia in 1999 had 5.1 years of schooling, the average 20 year-old had 8.7 years. Nevertheless, even before the financial crisis, compared to other nations in the region and to other nations with similar income per capita, Indonesia had higher infant mortality, lower life expectancy and more child malnutrition.

Unlike many other developing nations in Asia, educational achievement of boys and girls is close to parity through secondary school. In 1999, girls had slightly higher primary school enrollment than boys (95.6 vs. 94.9%, ages 7-12), while boys had slightly higher early secondary school enrollment (79.3 vs. 78.7%, ages 13-15). This enrollment gap widens only a small amount in late secondary school, with boys at 51.5% and girls at 50.8% (ages 16-18).

Despite the fact that education in Indonesia is inexpensive and widely accessible, many families choose not to keep their children in school. Common motives for not enrolling children include (especially for poor families) the cost of uniforms and supplies, difficulties commuting in some areas, and the usefulness of child and youth labor at home, on the family farm, or in employment. This paper examines the effect of a large financial shock, the death of a parent, on a family's decision to keep children enrolled.

Indonesia is an important place to examine the effects of adult mortality on children because, as in many developing countries, access to formal insurance mechanisms is poor. Only 1.8% of households in 1999 paid for any kind of insurance. Furthermore, almost half of Indonesian workers were self-employed in 1999, and few companies offer death benefits. With weak formal insurance systems and low initial income and assets in most families, many Indonesian children are at risk of harm after a decline in family resources.

In spite of the weak formal institutions, several informal institutions may reduce harm to children after the loss of a parent.[6] Most directly useful in the short run is the tradition (at least on Java, where roughly half of Indonesians live) that neighbors and family members who attend a funeral contribute cash and food to the survivors. In the longer term, the Muslim tradition of giving alms to widows and their children at least once a year can be helpful in communities where that tradition functions well. Also important in the longer term is the common custom of fostering out children to relatives in hard times.

Finally, the tradition in much of Indonesia of *gotong royong*, or mutual assistance, serves to assist families in trouble. Mutual assistance such as sharing food, lending small amounts of money, and caring for others' children can be essential for families that have lost a parent. At the same time, the ethnographic literature stresses that all parties expect this mutual assistance to balance out over a period of time. Thus, a family suffering a permanent income decrease, such as follows loss of a prime-age adult, will lose some of its assistance from former exchange partners.

[5] *Education Development in Indonesia: A Country Report,* Ministry of Education and Culture, Jakarta 1996. 1999 figure from Susenas, described below.
[6] See Sullivan 1994, Geertz 1961: 26, 29 and 83; and Jellinek 1991 for ethnographic descriptions of these institutions.

Data

We analyze Indonesia's National Socio-Economic Survey, known by its Indonesian acronym Susenas. The Susenas is an annually repeated cross section of approximately 200,000 households. We examine three years of Susenas surveys, from 1994 to 1996, and therefore have a sample of over six hundred thousand households.

Susenas surveys the head of the household on the general welfare of each household member, in areas such as school enrollment, health, and mortality. For household members over age 4, Susenas has information on current school attendance, the highest school level ever attended, and the highest grade ever attended. School levels range from primary school to senior high school and above.

The Susenas sample was selected to be representative for each of Indonesia's roughly 300 districts. The 36,000 enumeration areas surveyed are drawn from the nation's 176,582 enumeration areas (Surbakti 1997: 23). The Indonesian Bureau of Statistics mapped enumeration areas so that there is a clear boundary and between 200 and 300 households and other buildings (Surbakti 1997: 29). Although Indonesian cities are often more complexly laid out than are American cities, one can think of enumeration areas as similar to a US city block.

Our bereaved sample (3,273 observations) includes respondents aged 6 through 20, who are children of the household head and spouse, and who live in households where either the head or spouse died within the year prior to the survey.[7]

Our control group (14,318 observations) consists of respondents aged 6 through 20, who live in households where their parent is the household head, and which is in the same neighborhood as a child who lost a parent. By comparing households in roughly the same block, our geographic controls capture many dimensions of the household, such as exposure to contagious diseases or distance to a health clinic or school. Moreover, in Indonesia, as in the rest of the world, geographic segregation based on income, education, ethnicity, and other factors has important effects on investments in children.

The Susenas dataset provides cross-sectional data on enrollments, yet we would like to be able to examine how changes in the number of surviving parents affects changes in enrollment. To calculate the change in enrollment, we select a population that was near the age-appropriate grade level. This population is likely to have been enrolled in the previous year. For example, if a 15 year old's educational attainment was the fourth grade, we do not consider her for the sample at risk for dropping out of high school last year. Specifically, we divided bereaved and control observations in overlapping 4-year age groups, and conditioned on the attainment of an age adjusted education level, as Table 1 details. The age-appropriate school level for each 4-year age group was determined by a nation-wide analysis that shows approximately 95% of students currently enrolled in each grade level are in the designated four-year age group (see Appendix 1).

[7] Susenas links children with their biological mother if she lives in the same household, which allows us to exclude stepmother cases from the controls. Susenas also gives each member's relationship to the household head, who is usually male, but does not distinguish between children and stepchildren. We are therefore unable to exclude many stepfather cases. Furthermore, because information linking children to their father is only available for children and stepchildren of the household head, other children are excluded from this study.

Table 1: Educational Conditioning of Bereaved and Control Groups

		Total Sample Observations		
Age Group	Conditioned On:	Bereaved	Control	Total
6-9	Started first grade	765	3497	4262
7-10	Started second grade	800	3568	4368
8-11	Started third grade	769	3059	3828
9-12	Started fourth grade	834	3225	4059
10-13	Started fifth grade	802	2928	3730
11-14	Started sixth grade	829	2686	3515
12-15	Started seventh grade	587	1820	2407
13-16	Started eighth grade	565	1617	2182
14-17	Started ninth grade	501	1307	1808
15-18	Started tenth grade	381	760	1141
16-19	Started eleventh grade	384	699	1083
17-20	Started twelfth grade	326	524	850

Note: Bereaved households lost a parent in the previous year. Controls were two-parent households in the same neighborhood and with a child of the same age and schooling level as a bereaved household.

By selecting control children that are the same age, have the same education level and are in the same neighborhood as bereaved children, we are comparing two groups that are similar with respect to many household characteristics. As Table 2 shows, bereaved and control households have similar quality housing (with the exception of slightly better wall construction for controls).

Because bereaved households generally have older households heads and spouses, however, family composition varies slightly between bereaved and control households. On average, bereaved families have 0.08 fewer children than control families (gap significant at the 5 percent level). Furthermore, household head and spouse education levels vary between the two household types. This gap is, again, because bereaved heads and spouses are older than controls, and older Indonesians generally have had less education.

Table 2: Descriptive Statistics, Household-Level Variables

	Control		Bereaved		Difference			All Households	
Household Characteristics	Mean	SE	Mean	SE	Diff	SE	Pr>|t|	Mean	SE
Floor size (m^2)	68.314	1.186	70.978	2.345	2.664	2.050	0.194	65.169	0.083
Wall quality high	0.831	0.009	0.804	0.013	-0.027	0.013	0.032	0.776	0.001
Roof quality high	0.540	0.017	0.528	0.016	-0.012	0.011	0.307	0.545	0.001
Floor quality high	0.622	0.013	0.605	0.015	-0.017	0.013	0.194	0.572	0.001
Electricity	0.678	0.014	0.666	0.015	-0.013	0.012	0.291	0.667	0.001
Private water source	0.551	0.014	0.529	0.016	-0.022	0.014	0.122	0.480	0.001
Easy-access water source	0.482	0.015	0.466	0.016	-0.017	0.015	0.268	0.453	0.001
Toilet	0.372	0.015	0.359	0.016	-0.013	0.014	0.331	0.349	0.001
Note: Appendix 2 provides variable definitions.									
Household Composition	Mean	SE	Mean	SE	Diff	SE	Pr>|t|	Mean	SE
Household size	5.505	0.033	4.488	0.057	-1.016	0.057	0.000	4.285	0.003
# children of household head*	2.649	0.023	2.572	0.042	-0.077	0.042	0.066	2.822	0.004
# daughters of household head*	1.262	0.016	1.268	0.035	-0.083	0.034	0.015	1.347	0.003
# sons of household head*	1.387	0.017	1.303	0.032	0.006	0.036	0.871	1.475	0.003
**Includes only households where household (hh) head has children*									
Household head and spouse									
Primary head is female	0.001	0.000	0.674	0.015	0.673	0.015	0.000	0.127	0.001
Age of female head or spouse (FH)*	37.379	0.122	41.335	0.225	3.956	0.234	0.000	39.790	0.022
Age of male head or spouse (MH)*	42.835	0.140	47.898	0.283	5.064	0.302	0.000	43.572	0.023
School years, FH 20-39	6.015	0.106	5.287	0.146	0.728	0.142	0.000	6.270	0.008
School years, FH 40-59	5.754	0.131	4.769	0.145	0.985	0.167	0.000	4.200	0.011
School years, FH 60+	3.235	0.944	3.812	0.765	-0.577	1.215	0.635	1.783	0.015
School years, MH 20-39	6.811	0.109	6.191	0.206	0.620	0.214	0.004	7.401	0.010
School years, MH 40-59	7.194	0.133	6.602	0.149	0.592	0.137	0.000	6.185	0.011
School years, MH 60+	5.148	0.355	4.895	0.320	0.254	0.465	0.586	3.580	0.016

*Note: Here the female head (FH) is the household head in cases where the reported head is female, and the spouse of the household head if the reported head is male. The reverse holds for data on the male head (MH).

Consumption patterns vary between the household that did and did not suffer the loss of a parent the previous year. Bereaved and control households are not significantly different in the share, or per capita rupiah value spent monthly on food and non-food consumption (Table 3). They do vary, however, in the distribution of non-food spending. Bereaved households spend an average of 12.1% more of their total monthly expenditures on health and ceremony expenses than control households do. These higher expenditures are expected in families that lost an adult and hosted a funeral. Both the bereaved and control households we have selected spend on average 4.6% less per month per capita than the average Indonesian household.

Table 3: Monthly Household Consumption of Bereaved, Control and All Households

	Control		Bereaved		Difference			All Households	
Per Capita Monthly HH Consumption	Mean	SE	Mean	SE	Diff	SE	Pr>|t|	Mean	SE
Food	28,291	808	28,060	649	-231	518	0.656	30,804	36.0
Alcohol & tobacco	2,986	69	1,917	103	-1,069	110	0.000	3,368	8.0
Alcohol & tobacco, adult pc	5,825	129	3,531	204	-2,295	211	0.000	5,139	11.1
Health and ceremonies	3,140	218	8,829	1,595	5,689	1603	0.000	3,623	60.5
Other non-food	22,590	2,091	19,746	1,130	-2,843	1536	0.064	22,226	107.7
All non-food	28,715	2,198	30,492	2,099	1,777	2254	0.430	29,217	126.9
Total	57,006	2,933	58,553	2,472	1,546	2554	0.545	60,020	144.0
HH Consumption Shares	Mean	SE	Mean	SE	Diff	SE	Pr>|t|	Mean	SE
Food	0.588	0.004	0.585	0.005	-0.004	0.004	0.363	0.595	0.000
Tobacco and alchohol	0.066	0.001	0.040	0.002	-0.026	0.002	0.000	0.065	0.000
Health and ceremonies	0.183	0.006	0.304	0.017	0.121	0.017	0.000	0.179	0.001
Other non-food	0.163	0.006	0.071	0.015	-0.092	0.015	0.000	0.161	0.001
All non-food	0.412	0.004	0.415	0.005	0.004	0.004	0.363	0.356	0.000
					Total				
# observations (hh)	9,135		1,754		10,889			612,418	

Note: Household food consumption data is given for the week prior to the survey date, and non-food consumption is given for the prior year. Both sets of data were first converted to monthly consumption and then adjusted for household members who died in the last year, by adding $1/24^{th}$ to the household size in per capita calculations. Pr>|t| presents the value of the t-test that the difference in means between the control and bereaved households is statistically significant.

Methodology

Our first set of results compares enrollment means of students in the bereaved and control samples, divided into 12 overlapping age groups. The gap in enrollment between these two groups is due both to parental death and to any household characteristics that differ between families that live in the same neighborhood but are at high and low risk of parental death.

Regression adjustments

To control for variables that jointly determine enrollment and parental well-being, we ran logistic regressions for each age group with a fixed effect for each enumeration area. These fixed-effect (conditional) logit equations predict how enrollment changes after a recent parental death. For each age group, we estimate the probability of enrollment by enumeration area

To perform this analysis we took advantage of the fact that the Susenas data were collected by sampling approximately 16 households within an enumeration area, where an enumeration area is a contiguous set of houses corresponding to roughly a city block. In the discussion below we refer to youth from the same

enumeration area as being from the same neighborhood; given the rural setting for the majority of our sample, it would be equally accurate to refer to them as youth from the same village.

By controlling for neighborhood fixed effects, this model accounts for all factors that are constant within an enumeration area. These factors include neighborhood influences on children, common labor market, distance to a health clinic and school, and many other factors that influence all children in a village or neighborhood.

The equation we estimate is:

$$\text{Prob}(E_{ij} = 1 | E_{lj}=1, E_{kj}=0) = \Lambda(\boldsymbol{\beta}'\mathbf{x}_{ij}) = \exp(\boldsymbol{\beta}'\mathbf{x}_{ij}) / (\textstyle\sum_{m=i} \exp(\boldsymbol{\beta}'\mathbf{x}_{mj}))$$

where E = enrollment

$i = 1, \ldots,$ I children in specified four-year age-group, with age-appropriate schooling, k, j ϶ I and $k \neq j$, { There is some mislabeling here. The explanation for l is missing.xx}

$j = 1, \ldots,$ J enumeration areas,

$\boldsymbol{\beta}'\mathbf{x}_{ij} = \beta^{p}_{ij} + \beta^{1}_{ij}x^{1}_{ij} + \ldots + \beta^{n}_{ij}x^{n}_{ij}$,

β^{p}_{ij} = coefficient on parent died dummy,

$\mathbf{x} = x_1 \ldots x_n$ = household and individual characteristics that affect enrollment,

and

$\Lambda(\cdot)$ denotes the conditional logistic cumulative distribution function, whose form is given above.

The coefficient on the parent died dummy variable, β^{p}_{ij}, gives the magnitude and significance of the effect of a recent parent death on enrollment of child i in neighborhood j. Furthermore, using the parametric approach allows us to control for household characteristics that may be correlated with death and enrollment, such as parent's age, household size, household construction, access to electricity and plumbing, and many others.

The conditional logit procedure only uses information from neighborhoods both a bereaved and control observation is present and where their enrollment outcomes differed.

Propensity score matching within a neighborhood

Our final set of results uses a propensity score matching estimator. Unlike fully parametric estimation techniques, this approach does not impose strong restrictions on functional forms. These restrictions are an important limitation on conditional logits, because our sample of children varies widely in key characteristics, even after conditioning for age and education level. The assumption of a logistic function

requires a single estimated effect to be calculated from a data set of children who differ widely in individual characteristics, and these characteristics may have different effects depending on their values.

The ideal experiment compares the outcome when two identical individuals are exposed to the same treatment. The propensity score matching method is an approximation of this experiment. Instead of comparing each treated individual to an exact untreated counterpart, the matching method finds the closest match within a highly comparable subsample of controls.

Here, the "closest" individual is defined as the one living in the same neighborhood who is most similar to the bereaved observation in the set of characteristics that are significant in determining who loses a parent. Heckman, Ickimura and Todd (1997) stress the importance of the distribution of the probability coming from the same support. To further test the strength of within-neighborhood matching, we compared these results to those obtained by matching within the entire sample. While both sets of results support the same conclusions, the full-sample matching results are less consistent (see Appendix 3).

This propensity score is found by running conditional logits, similar to the ones described above, to estimate the probability of a parent dying in the previous year. We matched each child who had a parent die in the previous year with a child from a two-parent family, who had the closest propensity score among neighbors who were in the same four-year age group, had completed the same level of education. Research using the matching method has shown that matching on the propensity score may be more powerful and accurate than standard regression techniques, particularly when controlling for region fixed effects (Rosenbaum and Rubin 1983; Dehejia and Wahba 1998).

Potential Biases

While the methodologies we used are designed to minimize bias, unobserved characteristics remain that can bias the results. In addition, data gaps may distort our results. For several reasons most of these biases reduce the estimated magnitude of the effect of parental death on child enrollment. Thus, the true effect of losing a parent is probably larger than our estimates.

First, because Susenas only allows us to link household heads with their children, we are not able to capture the effect of a shock on children whose parents are not the head of the household in which they live. For example, children sent to live with relatives or other families after a parent's death cannot be included in the bereaved group. These children may be at greater risk of dropping out of school, and therefore omitting them reduces our estimates.

Second, Susenas only surveys children living in households. This means that our data does not include street children or children living in institutions such as orphanages. These transitions are probably more likely after a parent dies, and missing them will probably cause us to underestimate the impact of parental death on children's welfare.

Third, consider the extreme case of a family with a father who (1) manages all of the family's property; and (2) does not act as an altruist in determining consumption and education spending for each member of the family. In this situation, it is possible for the self-interested father to allocate more to his personal consumption than he produces (summing the value of labor market plus self-employment earnings plus home production). In this extreme case, if the mother makes decisions with more focus on the interests of

the child, the death of the father can actually increase children's welfare. First, she will now have control over the family's asset income. If the father controlled the wife's earnings, then even in families with no property income, children can benefit because the mother will now have control over her own earnings and home production. Because household resources are being reallocated toward children in this special case, the financial shock due to a parent's death may be underestimated.

Working in the other direction, if the survey is taken during a transitory period after the death of a parent, we may over-estimate the gap in enrollment due to this shock. A child and the family may be busy with funeral, they may be preparing to move, or they may just have moved and not yet have re-enrolled in school.

Results

We first present a comparison of means, then the traditional regression estimate, and finally the matching estimates.

Basic Results

Our first set of results simply compares average enrollment of bereaved children and their neighbors of the same age and sex by age and education group. These results show that the dropout rate for children who have recently lost a parent is significantly higher in all age groups than it is for their peers in two-parent households (Table 4). The results also suggest that older children's enrollment is more affected by a parent's death. The only exception is if a student has just completed a school level. For example, the difference in enrollment drops from 6.8 percent for students who have started, and in many cases finished, the last year of primary school, to 5.7 percent for students who have begun the first year of junior high school. The gap drops again from 9.5 percent for students who are in their last year of junior high school, to 7.3 percent for those who have started senior high school.

Table 4: Difference in Enrollment Rates Between Bereaved and Control Age-Groups

Normative	CONTROLS			BEREAVED			DIFFERENCE			Relative
Grade	Obs	Mean	SE	Obs	Mean	SE	Diff	SE	Pr>|t|	Dropout
1	3497	0.996	0.001	765	0.979	0.007	-0.017	0.007	0.015	5.18
2	3568	0.991	0.002	800	0.969	0.008	-0.022	0.008	0.010	3.37
3	3059	0.983	0.003	769	0.965	0.008	-0.018	0.009	0.046	2.08
4	3225	0.975	0.004	834	0.942	0.010	-0.033	0.011	0.002	2.30
5	2928	0.934	0.008	802	0.884	0.015	-0.050	0.014	0.000	1.76
6	2686	0.879	0.012	829	0.811	0.017	-0.068	0.017	0.000	1.57
7	1820	0.971	0.005	587	0.914	0.017	-0.057	0.018	0.001	2.93
8	1617	0.938	0.008	565	0.856	0.020	-0.082	0.021	0.000	2.31
9	1307	0.904	0.013	501	0.809	0.022	-0.095	0.024	0.000	2.00
10	760	0.937	0.011	381	0.865	0.024	-0.073	0.023	0.002	2.16
11	699	0.858	0.016	384	0.754	0.029	-0.103	0.031	0.001	1.73
12	524	0.642	0.029	326	0.534	0.037	-0.108	0.042	0.011	1.30

Notes: Both control and bereaved children were within the normal range for completed schooling given their age. Control children live in the same enumeration area and are the same age and sex as a bereaved child. Pr>|t| presents the probability that the t-statistic rejects equality for the mean enrollment rate of bereaved and control children.

While the gap in enrollment increases as students advance within each school level, overall enrollment declines as children get older. The relative dropout rate (% bereaved dropouts/%control dropouts), therefore, actually declines within each major school level and jumps at the start of new school level. This result implies that bereaved students have a lower risk of being pulled out of school in response to a parent's death as they are nearing completion of a school level. The hazard increases at the beginning of a school level, possibly because the returns to a year of education are higher if by completing that year the student also completes a new school level. Table 4 shows that the relative dropout rate falls in 5^{th} and 6^{th} grade, as primary school is ending, and jumps at the beginning of 7^{th} grade (junior high school). Similarly, the relative dropout rate falls as students advance in junior high school, and jumps again at the beginning of 10^{th} grade (senior high school). Finally, the relative dropout rate is highest after starting first grade, possibly because it is easier for parents to restart their children in school, rather than withdrawing them and reenrolling them after they have completed several years of schooling.

Enrollment comparisons using conditional logits control for household characteristics, such as wealth, which may be inversely correlated to parental death and independently have an impact on school enrollment. Controlling for these factors reduces the impact of parental death on enrollment relative to the difference in means results, although the pattern of risk is similar (Table 5). Students who are completing a level of schooling (that is, primary school or junior high school) have a lower risk of dropping out relative to their peers, than students who have started the next level of schooling. Differences in enrollment after age and education group 9 are insignificant in the conditional logit results.

The results of Table 4 are also expressed as the Relative Dropout, which is in the last column. Bereaved families are over 5 times more likely to fail to enroll a child entering first grade than a similar child in a control (2-parent) family. A child in the last grade of high school who loses a parent is 1.2 times as likely

to fail to enroll compared with a control child. Averaging over all grades a bereaved child is 2.4 times as likely to stop school as a control child.

Table 5: Conditional Logit Result Summary

Normative	Retained Obervations			Parent Died				Relative
Grade	Control	Bereaved	Total	Coefficient	Std E	Pr>|z|	dP/dx	Dropout
1	136	30	166	-3.443	1.241	0.006	-0.022	4.42
2	267	56	323	-1.342	0.445	0.003	-0.017	2.32
3	345	72	417	-1.282	0.387	0.001	-0.026	2.26
4	487	113	600	-0.672	0.270	0.013	-0.021	1.65
5	653	177	830	-0.384	0.208	0.064	-0.027	1.35
6	848	267	1115	-0.403	0.168	0.017	-0.049	1.35
7	274	83	357	-0.952	0.283	0.001	-0.042	1.91
8	385	133	518	-0.899	0.242	0.000	-0.069	1.82
9	424	155	579	-0.706	0.218	0.001	-0.076	1.62
10	154	71	225	0.161	0.383	0.675	0.013	0.85
11	299	125	424	-0.264	0.259	0.308	-0.038	1.22
12	296	139	435	-0.300	0.246	0.223	-0.072	1.18

Notes: Additional control variables are listed Appendix 2.
Relative dropout rate is bereaved dropout /control dropout percent. Sample sizes are smaller than in other analyses because only enumeration areas with bereaved and control children whose dropout status differed are retained in this analysis.

The matching approach removes the functional form restrictions imposed by the conditional logit results. Comparing bereaved children with controls with the closest propensity score, however, yields similar results to the parametric approach (Table 6): The hazard again decreases with age through sixth grade, increases after children start junior high, and declines again until senior high school.

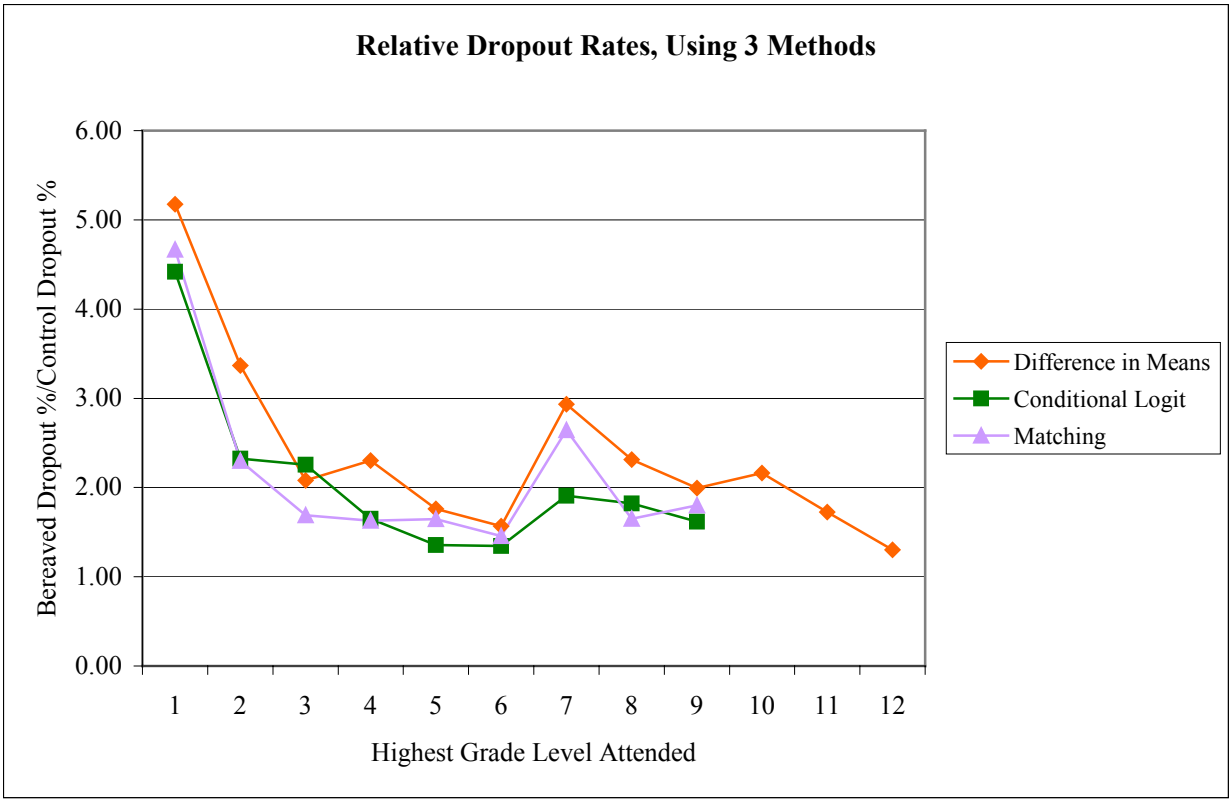
Table 6: Matching Technique Results

Normative Grade	Both Enrld	Only Control Enrld	Only Bereaved Enrld	Neither Enrld	Total Pairs	Cntl Enr %	Bereaved Enr %	Diff	Odds Ratio	Relative Dropout**	Pr>|t|
1	728	14	3	0	745	0.996	0.981	-0.015	0.214	4.667	0.007
2	754	23	10	0	787	0.987	0.971	-0.017	0.435	2.300	0.022
3	707	27	16	0	750	0.979	0.964	-0.015	0.593	1.688	0.089
4	741	41	24	3	809	0.967	0.946	-0.021	0.585	1.630	0.039
5	653	68	35	16	772	0.934	0.891	-0.043	0.515	1.647	0.003
6	590	99	56	38	783	0.880	0.825	-0.055	0.566	1.457	0.002
7	499	35	12	2	548	0.974	0.932	-0.042	0.343	2.643.	0.001
8	426	50	26	11	513	0.928	0.881	-0.047	0.520	1.649	0.011
9	325	67	31	14	437	0.897	0.815	-0.082	0.463	1.800	0.001
10	250	22	24	11	307	0.886	0.893	0.007	1.091	0.943	0.797
11	199	46	31	16	292	0.839	0.788	-0.051	0.674	1.319	0.112
12	79	54	42	50	225	0.591	0.538	-0.053	0.778	1.130	0.255
Sum*	5951	546	310	161	6968						
Wtd avg						0.836	0.812	-0.030	0.419	1.740	

*Note: The total number of distinct observations included above is 6756 (2879 bereaved children and 3877 controls). This number is smaller than the sum of the control and bereaved observations above (13936 = 6968 x 2)given because certain observations appear in more than one overlapping age-group, and a control can be matched to more than one bereaved child.

**Note: Relative dropout = bereaved dropout percent /control dropout percent.

When we compare the relative dropout rates calculated using the three approaches, we again see that the pattern of the effect is similar in all three cases, although the magnitude of the effect is generally smaller when household characteristics have not been controlled for (see Chart 1). That the standard statisitical analysis (conditional logit, Table 4) and matching estimates (Table 5) are similar in pattern and magnitude increases our confidence in these results.



Imperfect capital markets

The results in Tables 4 through 6 reject hypothesis 1, based on the assumption of perfect capital markets, that enrollment is unaffected by parental loss. To further test the relationship between liquidity constraint and the effect of a parent's death, we ran our conditional logit model again, this time including an interaction with parent death and an index of advantage,

To create the index of advantage, we estimated consumption as a function of surviving parent education, average neighborhood consumption, family composition and household construction quality. The predicted value from this equation is a sensible measure of a family's permanent income. In a situation where borrowing is often difficult, high estimated consumption also correlates with high current assets. On average, we expect families with a high index of advantage (that is, predicted consumption) to be less likely to face liquidity constraints after a negative income shock.

As the results in Table 7 show, high-asset families do not experience a lower effect of parental death. The interaction term is small and not statistically significant. Thus, there is no evidence that children in households pre-existing advantages suffer smaller enrollment declines after losing a parent.

Table 7: The effect of the interaction between high assets and parental loss on school enrollment
Conditional logit estimates

Dependent Variable		Enrollment dummy	
Number of obs	8,830	LR chi2(42)	1,825
		Prob > chi2	0.00
Pseudo R2	0.361	Log likelihood	-1,618

Independent Variables	**Coef**	**Std Err**	**z**	**P>|z|**
Parent died	-1.420	0.251	-5.660	0.000
Advantage index	4.138	0.629	6.570	0.000
Parent died * advantage	0.220	0.280	0.780	0.433
# Siblings	-0.061	0.049	-1.250	0.212
Son	0.005	0.137	0.030	0.973
Oldest son	-0.297	0.124	-2.390	0.017
Oldest daughter	-0.384	0.125	-3.070	0.002

Other controls include number of siblings, mother and fathers' ages, house characteristics, child age/education group dummies and these dummies interacted with parent died dummy.

Intra-household allocation

Theories of intra-household allocation suggest that daughters (hypothesis 4), especially eldest daughters (hypothesis 3), will be particularly disadvantaged after the loss of a parent . Moreover, if sons are favored, then losing a parent is more costly to children when they have many brothers than if they have many sisters (hypothesis 5).

While it is not true that daughters are more likely to drop out than are sons (Table 8, Specification A, providing no support for hypothesis 4), it is true that eldest daughters who have younger siblings are more likely to drop out than are sons (Specification B, providing support for hypothesis 3). This result is consistent with the hypothesis that the eldest daughter steps in to perform childcare and housework after parent dies. After seeing these results we realized they might hold largely after loss of a mother, as a daughter's labor may be a better substitute for her mother's work than for her father's. In results not shown, the effect on oldest daughters was not statistically significantly larger if her mother died than if her father died.

Finally, the proportion of siblings who are brothers has no effect on the increased rate of dropping out by children who lose a parent (Specification D, contradicting hypothesis 5). These results were similar when we added interactions separately for each grade level (results available on request).

Table 8: Intrahousehold Results, Part 1
Conditional Logit Coefficients, Dependent Variable = Enrollment

	Specification A			Specification B			Specification C			Specification D		
	dP/dx	Std. Er	P>|z|	dP/dx	Std. Er	P>|z|	dP/dx	Std. Er	P>|z|	dP/dx	Std. Er	P>|z|
Parent died (prtd)	0.105	0.662	0.031	0.108	0.663	0.025	0.074	0.697	0.144	0.071	0.698	0.163
Daughter	-0.007	0.088	0.287	-0.006	0.111	0.482	-0.008	0.112	0.358	-0.007	0.112	0.406
Daughter*prtd	0.005	0.178	0.682	0.024	0.223	0.139	0.025	0.224	0.122	0.025	0.225	0.124
Oldest daughter				-0.002	0.134	0.856	0.002	0.135	0.879	0.000	0.139	0.991
Oldest daughter*prtd				-0.039	0.267	0.046	-0.043	0.270	0.028	-0.046	0.277	0.023
Siblings							-0.011	0.053	0.006	-0.011	0.053	0.005
Siblings*prtd							0.013	0.073	0.018	0.012	0.075	0.033
Brothers										0.004	0.123	0.625
Brothers*prtd										0.014	0.252	0.464
Oldest	-0.038	0.090	0.000	-0.036	0.096	0.000	-0.042	0.103	0.000	-0.041	0.104	0.000

Other controls include mother and fathers' ages, house characteristics, child age/education group dummies and these dummies interacted with parent died dummy.

Loss of a mother vs. a father

If fathers' higher average earnings play a larger role in children's education than do mothers' traditional larger role in child rearing and tying to social networks, then we expect the loss of a father to have a larger effect on children's education than the loss of a mother (hypothesis 6). In fact, when we ran a pooled conditional logit with age and education dummies, there is no statistically significant difference in the effect of maternal and paternal mortality (Table 8, Specification E). When we re-ran the analysis interacting paternal loss with each grade, was the reverse of that proposed above: paternal loss mattered slightly more for elementary school continuation than for higher grades (results available on request). Finally, maternal and paternal loss did not appear to have a larger effect on own-sex children (Specification F).

Table 8: Intrahousehold Results, Part 2
Conditional Logit Coefficients, Dependent Variable = Enrollment

	Specification E			Specification F				
	dP/dx	Std. Er	P>|z|	dP/dx	Std. Er	P>|z|	Mean	Std D
Parent died	0.072	0.698	0.156	0.070	0.699	0.169	0.186	0.389
Daughter	-0.007	0.112	0.401	-0.007	0.113	0.408	0.485	0.500
Daughter* Parent died	0.026	0.225	0.120	0.032	0.252	0.078	0.091	0.287
Oldest daughter	0.000	0.139	0.989	0.000	0.139	0.999	0.181	0.385
Oldest daughter* Parent died[1]	-0.046	0.277	0.023	-0.047	0.277	0.021	0.032	0.175
Siblings	-0.011	0.053	0.005	-0.011	0.053	0.005	2.962	1.330
Siblings* Parent died	0.012	0.075	0.032	0.012	0.075	0.032	0.552	1.295
Brothers	0.004	0.123	0.621	0.004	0.123	0.619	0.456	0.397
Brothers* Parent died	0.013	0.252	0.470	0.014	0.252	0.461	0.084	0.244
Mother died	-0.008	0.185	0.577	0.002	0.243	0.911	0.060	0.238
Daughter*mother died				-0.020	0.335	0.404	0.030	0.172
Oldest	-0.041	0.104	0.000	-0.041	0.104	0.000	0.378	0.485

Other controls include mother and fathers' ages, house characteristics, child age/education group dummies and these dummies interacted with parent died dummy.
[1]Specification F was also run with Oldest daughter * mother died replacing Oldest daughter * parent died. The coefficient in this case was not significant.

Conclusions

The basic result of this paper is that a recent parent's death reduces children's enrollment in Indonesia. This effect is highest for youth at the transitions between primary and junior secondary and between junior secondary and secondary. Our results are more convincing than past findings for two reasons. First, we use both parametric and semi-nonparametric methods. Second, we have a much larger sample size than most prior research on this topic

Our findings have important implications for children of bereaved families in developing countries. In Indonesia in 1999, about 2.2 million children under the age of fifteen were living with a widowed parent.[8] Our results indicate that children in such families have roughly 50 percent higher rates of school leaving than do their classmates. Given the high returns to education in Indonesia, even at primary levels, and the high percentage of families living at or below the poverty level, this loss in schooling could substantially reduce the future living standard of these children.

While our research shows a substantial short-term impact of a parent's death on enrollment, additional work is needed to identify the long-term effects. For example, a parent's death may lead to a child's temporary exit from school due to a change in residence or short-term work requirements until the household's income stream is stabilized. Depending on the length of time away from school and the probability of reenrollment, the long-term effect on a child's schooling could vary dramatically. While determining the magnitude of this effect is not within the scope of this study, it is an important issue for future research.

[8] Susenas, 1999

Additionally, improved data would be useful to better capture the direct effect of parental loss on enrollment. Because our data set is not a true panel, it does not include information on children's enrollment status prior to their parent's death. While we used several methods to infer the enrollment status of children before their parent's death, the variation in the age at which children start school in Indonesia makes it impossible to be fully confident in our assumptions.

Appendix 1: Percentage of Students in Each Grade, by Age

Grade:	Primary School						Junior High			Senior High		
	1	2	3	4	5	6	7	8	9	10	11	12
Age												
5	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6	**26%**	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7	**51%**	**18%**	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8	**14%**	**47%**	**15%**	1%	0%	0%	0%	0%	0%	0%	0%	0%
9	**3%**	**24%**	**44%**	**14%**	1%	0%	0%	0%	0%	0%	0%	0%
10	1%	**6%**	**29%**	**45%**	**15%**	1%	0%	0%	0%	0%	0%	0%
11	1%	1%	**7%**	**26%**	**41%**	**14%**	1%	0%	0%	0%	0%	0%
12	1%	1%	3%	**9%**	**30%**	**47%**	**18%**	2%	0%	0%	0%	0%
13	0%	0%	1%	3%	**9%**	**27%**	**45%**	**18%**	2%	0%	0%	0%
14	0%	0%	0%	1%	3%	**8%**	**25%**	**44%**	**18%**	2%	0%	0%
15	0%	0%	0%	0%	1%	2%	**7%**	**25%**	**46%**	**19%**	2%	0%
16	0%	0%	0%	0%	0%	1%	2%	**7%**	**24%**	**49%**	**23%**	3%
17	0%	0%	0%	0%	0%	0%	1%	2%	**7%**	**22%**	**47%**	**23%**
18	0%	0%	0%	0%	0%	0%	0%	1%	2%	**6%**	**20%**	**42%**
19	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	**5%**	**21%**
20	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	**7%**
21	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
22	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Bold percentages are students are considered age-appropriate for that grade

Sum in bold	94%	95%	94%	95%	95%	95%	96%	95%	95%	95%	95%	94%

Appendix 2: Control Variables Used in Conditional Logit Regressions

No. of siblings, self included
1 if male
1 if oldest son
1 if oldest daughter
Mother's age
Father's age
Household size
Log(floor size)
Wall quality high = 1 if walls made from strong material (brick or wood).
Roof quality high = 1 if roof made from strong material (concrete, wood or tile)
Floor quality high = 1 if floors made from strong material (marble, ceramic or brick)
Electricity = 1 if household has access to electricity
Private water source = 1 if private water source
Easy access water source = 1 if household has protected and nearby water source
Toilet = 1 if household has a toilet

Appendix 3: Comparison of Matching Within the Entire Sample and Within Enumeration Area

Table A3.1 Matching with the Entire Sample

Normative Grade	Both Enrld	Only Control Enrld	Only Be-reaved Enrld	Neither Enrld	Total Pairs	Cntl Enr %	Be-reaved Enr %	Diff	Odds Ratio	Rel Dropout**	Pr>|t|
1	750	14	1	0	765	0.999	0.982	-0.017	0.071	14.000	0.001
2	761	24	15	0	800	0.981	0.970	-0.011	0.625	1.600	0.145
3	732	29	8	0	769	0.990	0.962	-0.027	0.276	3.625	0.001
4	753	42	34	5	834	0.953	0.944	-0.010	0.810	1.205	0.376
5	663	79	52	8	802	0.925	0.892	-0.034	0.658	1.450	0.020
6	579	130	101	19	829	0.855	0.820	-0.035	0.777	1.242	0.053
7	532	43	11	1	587	0.980	0.925	-0.055	0.256	3.667	0.000
8	409	57	87	12	565	0.825	0.878	0.053	1.526	0.697	0.012
9	324	69	82	26	501	0.784	0.810	0.026	1.188	0.880	0.307
10	304	43	31	3	381	0.911	0.879	-0.031	0.721	1.353	0.157
11	233	76	57	18	384	0.805	0.755	-0.049	0.750	1.253	0.098
12	81	55	92	98	326	0.417	0.531	0.113	1.673	0.805	0.004
Sum *	6121	661	571	190	7543						
Wtd avg						0.592	0.582	-0.010	0.435	2.516	

*Note: The total number of distinct observations included above is 6611 (3273 bereaved children and 3338 controls). This number is smaller than the sum of the control and bereaved observations above (15086 = 7543 x 2) because certain observations appear in more than one overlapping age-group, and a control can be matched to more than one bereaved.
What is Rel DO**? Dropout? Do not use * for footnotes to tables.

Table A3.2 Summary Statistics, Household Characteristics

	Best in Match in Entire Sample		Best Match in Enumeration Area		Difference		
Household Characteristics	Mean	SE	Mean	SE	Diff	SE	Pr>|t|
Floor size (m2)	69.804	0.584	69.349	0.618	-0.455	0.850	0.593
wall construction	0.774	0.005	0.838	0.005	0.063	0.007	0.000
roof construction	0.425	0.006	0.468	0.006	0.043	0.009	0.000
floor construction	0.522	0.006	0.587	0.006	0.065	0.008	0.000
Electricity	0.631	0.006	0.665	0.006	0.034	0.008	0.000
Private water	0.483	0.006	0.543	0.006	0.060	0.009	0.000
Water source	0.475	0.006	0.486	0.006	0.011	0.009	0.217
Toilet	0.363	0.006	0.397	0.006	0.034	0.008	0.000
Household Composition							
Household size	5.287	0.017	5.593	0.020	0.306	0.026	0.000
# children of hh head	2.832	0.015	2.888	0.016	0.056	0.022	0.010
# daughters of hh head	1.360	0.012	1.358	0.013	0.058	0.018	0.002
# sons of hh head	1.472	0.012	1.530	0.014	-0.001	0.017	0.935
Household head and spouse							
Primary head is female	0.001	0.000	0.000	0.000	-0.001	0.000	0.035
Age of female head (FH)	41.951	0.087	39.773	0.088	-2.178	0.124	0.000
Age of male head (MH)	48.027	0.103	45.379	0.103	-2.648	0.146	0.000
School years, FH 20-39	5.904	0.069	5.939	0.061	-0.035	0.092	0.704
School years, FH 40-59	4.881	0.057	5.793	0.072	-0.912	0.092	0.000
School years, FH 60+	3.983	0.495	4.429	0.755	-0.445	0.902	0.622
School years, MH 20-39	6.659	0.104	6.878	0.092	-0.218	0.139	0.115
School years, MH 40-59	6.470	0.060	7.264	0.063	-0.794	0.087	0.000
School years, MH 60+	4.675	0.115	5.513	0.188	-0.838	0.220	0.000

Table A3.3 Summary Statistics, Household Consumption

	Best Match in Sample		Best match in Enumeration Area		Entire sample – Enumeration area		
Per Capita Consumption	Mean	SE	Mean	SE	Diff	SE	Pr>|t|
Food	29,360	1,084	29,109	814	-251	849	0.768
Alcohol & tobacco	3,192	207	2,963	95	-229	214	0.286
Alcohol & tobacco, adult pc	5,620	312	5,604	183	-16	324	0.961
Health and ceremonies	3,192	269	3,609	327	417	351	0.234
Other non-food	25,896	2,461	25,600	2,346	-297	1,906	0.876
All non-food	32,280	2,603	32,171	2,458	-108	2,093	0.959
Total	61,640	3,429	61,281	3,132	-359	2,632	0.892
Household Consumption Shares							
Food	0.568	0.007	0.569	0.006	0.001	0.005	0.808
Tobacco and alcohol	0.064	0.003	0.062	0.002	-0.002	0.002	0.382
Health and ceremonies	0.197	0.013	0.198	0.011	0.001	0.013	0.963
Other non-food	0.172	0.013	0.172	0.011	0.000	0.011	0.984
All non-food	0.432	0.007	0.431	0.006	-0.001	0.005	0.808
# observations (hh)	7,543		6,203		13,746		

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