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Household Structure and Child Education in Cambodia

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Abstract

We analyze the effects of household structure on education in Cambodia. Consistent evidence documents that residence with both biological parents benefits children's education in Western countries. Elsewhere, the issue is gaining more attention with the growing number of "left-behind children" due to adult migration and, possibly, changes in family behavior, but the extant record is both thinner and more contrasted. Controlling for the presence of grandparents and some household characteristics, we find children residing with both biological parents are more likely to be enrolled in school, in the appropriate grade for their age, and literate than those living with only one parent. The effect sizes appear comparable to those in most Western countries, but the effects shrink or even disappear when grandparents are present. The results for children not residing with either parent are mixed, suggesting negative effects for some children might be blurred by positive selection for some others.

Keywords

Education; Family Demography; Global/International; Household Living Arrangements; Single Parents

In this paper, we analyze the effects of living arrangements on children's educational outcomes in Cambodia. Such effects have been extensively and fairly consistently documented in high-income Nations. With the notable exception of a body of research on the effects of orphanhood and child fosterage (e.g., Bledsoe 1990; Isiugo-Abanihe 1985; Madhavan 2004; Nyamukapa & Gregson 2005; Safman 2003), there had been comparatively little research on the topic in medium- and low-income Nations, at least until recently. A growing interest in the effects of children's living arrangements worldwide follows what may appear to be the emergence of a Second Demographic Transition" in non-Western Nations. Whether or not their recent demographic trends fit the pattern first identified in Europe (van de Kaa 1997), suffices to say that non-marital partnership formation and parental divorce have become more common in some South American and East Asian countries (Esteve et al. 2012; Raymo et al. 2015), where, as a result, the prevalence of children residing with both parents is decreasing. Moreover, work opportunities in urban and peri-urban areas and even abroad attract an increasing number of short-term and "circular" migrants and, among them, parents who temporarily, though durably sometimes, leave children behind (Collinson et al. 2006; Parreñas 2015).

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In the next section, we briefly review this growing literature, with an emphasis on Southeast Asia. We then describe recent demographic trends in Cambodia and the country's educational system. From this review and assessment of the current situation in Cambodia, we derive hypotheses about the direction and size of the effects of not residing with a biological parent, and the possible moderating effects of living in a multi-generational household. The subsequent section describes the data and methods used to test these hypotheses. The penultimate section describes our results. As discussed in the final section, they appear fairly consistent overall with the body of research conducted in high-income Nations, which, as discussed below, has not always been the case in medium- and low-income Nations. However, as some of the previous studies in these settings, we note some "anomalies" with respect to children residing with neither of their biological parents.

Background

Comparative Perspectives on the Effects of Living Arrangements

A central concern of the expansive literature on the effects of growing up with a single biological parent is the endogeneity of parents' living-arrangement decisions: parents who have a child outside of marriage and those who divorce can be expected to differ from those who remain married on many characteristics, some of which may very well affect their child's wellbeing regardless of whether these parents are married or not. Consequently, research on these effects in Western societies has become increasingly sophisticated in accounting for differences between households with children and both of their biological parents and other households in which children live. Nonetheless, the overall conclusion seems to stand that these differences, economic in particular, account for some—maybe half—but not all of the differences in various wellbeing indicators between children living with both of their biological parents and those in other living arrangements (among many reviews of this large literature, see, for instance, McLanahan, Tach & Schneider 2013).

A strain of comparative work across Western societies has also documented institutional effects on how children fare across different living arrangements (Cooke & Baxter 2010). Large international survey programs such as the Trends in International Mathematics and Science Study (TIMSS) or the Programme for International Student Assessment (PISA) have provided opportunities for cross-national research on these effects with respect to child educational performance. These studies have found that the difference between the average educational performance of children living with both of their biological parents and those in other living arrangements is positive in all countries. Within countries, this so-called "educational gradient" tends to increase slightly with age, but its magnitude varies markedly between countries. In multiple studies, gradients were also found to be larger in the U.S.A. than in any other country included in the analyses, and to become almost negligible in countries with the most generous welfare provisions. The magnitude of the gradients, typically adjusted for parental characteristics, is difficult to compare across studies because the parental variables used as control may vary. Using data on TIMSS "population-1" students (centered on 9 year-olds), the unadjusted U.S. gradients were estimated to amount to 20 to 29 points in Math and 17 to 33 points in Sciences (Pong et al. 2003). (In both TIMSS and PISA surveys, achievement scores are "curved" so that a standard deviation

(SD) is close to 100 points). For "population-2 students" (centered on 13 year-olds), researchers reported U.S. unadjusted gradients equivalent to 35 points in Math and 36 points in Sciences again analyzing TIMSS data (Heuveline et al. 2010). Using PISA data on 15 year-old students, unadjusted gradients in the U.S.A. have been estimated to range from 36 to 50 points in reading, 42 to 53 points in Math, and 37 points in Science (Garib et al. 2007; Hampden-Thomson 2013; Marks 2006).

In a systematic analysis of TIMSS data in non-Western societies, Schiller et al. (2004) found that educational gradients are related to a country's Gross Domestic Product, with the poorest countries exhibiting the smallest effects of living arrangements on children's education. If several country-specific analyses have replicated results from high-income countries regarding some advantage of living in an intact family (e.g., most recently, Chae 2016), some have also introduced nuances or even produced contrary findings. For instance, some studies found children residing with both biological parents to be out-performed by those residing with only one or none of their parents, suggesting a role for cultural norms that might shape the selection of children into particular living arrangements. Without delving into this country-specific literature (see DeRose et al. 2014 for a comprehensive review), we should note two issues that have received more attention in non-Western than in Western countries. The first one concerns the different effects associated with the different pathways into not residing with both biological parents. There has been some work on the differences between non-marital childbearing and divorce, or between divorce and widowhood in the West (e.g., Biblarz & Gottainer 2000), but there is more emphasis on these differences in countries where parental mortality continues to be one of the main pathway into single-parent-headed households (Beegle, De Weerdt & Dercon 2010; Birdthistle et al. 2009; Case & Ardington 2006; Evans & Miguel 2007; Gertler et al. 2004;) or in those where adult migration separates parents from their children (Kandel & Kao 2001; Kuhn 2006; Yao & Treiman 2011; Nobles 2011; Townsend et al. 2002). A recent article argues for negative selection among children with a deceased parent, but positive selection for the children left behind by their migrant parents in India (Das 2016). For Southeast Asia, Pong (2006) reported that in Malaysia's collectivist culture divorce and separation have a negative effect on children's education, but widowhood does not. In Indonesia and Thailand, Park (2007) found students in single-parent families to outperform their peers in intact families, which he links indirectly to the persistently strong norms against never-married or divorced parents. He argues that due to these strong norms a higher proportion of single parents are widows who may receive more social and institutional support than single parents elsewhere. In Vietnam, however, Loenzien (2016) reports lower enrollment and attainment levels for children of lone mothers, regardless of whether they are never married, divorced, separated or widowed.

Also having received some attention in the West (e.g., DeLeire & Kalil 2002) but being more central in other societies is the issue of multi-generational households and their potentially moderating role. Huisman & Smits (2009) found that the absence of one of the biological parents decreases a child's enrollment chances, but that living in an extended family, especially an extended family with grandparents, operates in the other direction. For Thailand, Mahaarcha & Kittisuksathit (2009) also showed the positive effect of having grandparents in the household on adolescent's school enrollment. These results are

consistent with the additional resources grand-parents contribute, both economic and social (inter-generational closure, Coleman 1988). In Japan, however, Shirahase & Raymo (2014) found children of single mothers to fare worse in multi-generational than in single-parent households. The authors tie these results to strong norms favoring nuclear living arrangements, since such norms imply highly-negative selection into multi-generational households.

Parenting and Living Arrangements in Cambodia

There is a strong norm against pre-marital childbearing in Cambodia. Anecdotally, data collectors on a fertility study in the late 1990s were found to skip fertility histories for never-married women for fear of offending study participants. In Phnom Penh at least—as in Bangkok (Esara 2012), Manila (Xenos & Kabamalan 2007) and probably other capital cities in Southeast Asia—pre-marital cohabitation is beginning to appear and may result in pre-marital conceptions and even births. Lacking national data on mothers' marital status at birth, however, it is impossible to know whether the phenomenon is limited to the capital city or even to its few highly "globalized" neighborhoods, where Westerners and Cambodian youths interact (Hoefinger 2013).

Trends in divorce are easier to track in survey data. If marriage stability among recent cohorts is markedly lower than among earlier ones, divorce remains rare. Among the late 1990s cohorts, only 6% had ended in divorce within 5 years of marriage (Heuveline & Poch 2006). Even though adult mortality has declined from the dramatically high levels of the late 1970s, parental death likely remains the most common reason for a child not to live with both biological parents. [Authors] report that parental mortality actually accounts for nearly half of children (46.2%) residing with only one of their biological parents.

Another increasingly common reason for parental absence appears to be work-related parental mobility. The majority of Cambodian households remains engaged in farming, and rice farming in particular. Towards the end of the dry season when the demands of agricultural work slow down considerably, farmers have commonly sought temporary work in the cities—men in construction, for instance, and women in street-food vending. With the relative decline of farming revenues relative to other sectors, such temporary migration has only become more frequent or more permanent (National Committee for Population and Development 2009). In particular, the rapid development of a garment industry (Chea & Sok 2001; Ear 2011) has fueled the migration of young female workers to the outskirts of the capital city (Derks 2008). At the outset, garment factories were recruiting almost exclusively among never-married women intending to save up some money before marriage. Over time, however, with wages substantially higher than the income that farming may generate, it has become more common for women to return to the factories after marriage.

A widely recognized normative sequence of living arrangements begins with newlyweds residing with the brides' parents, but only temporarily until they build up the desired resources to eventually settle their own independent household nearby (Ebihara 1968; [Authors]). Correspondingly, the dominant living arrangement is nuclear, with a preference for uxorilocality. However, Cambodian households can be quite pragmatic in their living arrangements and young couples routinely depart from the uxorilocal norm, for instance, if

economic opportunities are available near the groom's parents (Demont & Heuveline 2008). The prevalence of multigenerational households (in which, as will be shown below, nearly a quarter of all rural children under 18 years of age live) clearly exceeds what it would be were married couples in this living arrangement only for a few years after marriage. Another indication of this pragmatism is that nuclear households are less common in urban areas than in rural areas ([Authors]), as urban households are more frequently solicited to take in rural relatives who want to pursue work or education opportunities in the city.

Education and Social Welfare in Cambodia

The Royal Government of Cambodia's (RGC) official target is for all children to receive nine years of basic education from the first-grade enrollment age of 6 years to age 15 years (Ayres 2000). School enrollment among 6-to-14 year-olds has been gradually increasing to reach 88.5% for girls and 86.9% for boys in 2014, up from 84.5% and 83.9% respectively in 2009 (National Institute of Statistics 2015). As public education in Cambodia follows a 6 + 3 + 3 model (6 years of primary education, 3 years of lower- and 3 years of upper-secondary education), the 9-year target corresponds in theory to lower-secondary school completion. In reality though, late enrolment in first grade and grade repetition are both common and national statistics suggest that less than half of the 7^{th} graders are of the expected age of 12 years or younger (Ministry of Education, Youth, and Sports, 1997). The proportion of 18-to-24 year-olds who have actually completed lower-secondary school has increased from 27.3% for females and 37.3% for males in 2009 to 41.1% for females and 43.0% for males in 2014 (National Institute of Statistics 2015)—thus still less than half of the youths in these cohorts meet the official basic-education target.

The RGC has been aggressively attacking one of the barriers to universal school attendance —distance from the closest school in rural areas. In the past, parents might have been particularly reluctant to send young girls far away from their home village, but gender differences in attendance have declined as the RGC is moving closer to its stated goal of one primary school per village and one lower-secondary school per commune—an administrative unit typically consisting of 5 to 15 villages, depending on their size ([Authors]).

Unfortunately, the RGC has not made a similar commitment to supporting these schools' operating costs and their teachers' salaries (Ayres 2000; Brehm 2016). If public schools' tuition and fees are low, their students are not only expected to buy their own textbooks and supplies, but also to contribute to some of the school's running expenses, such as building maintenance funds, and to bring daily "gifts" to their teachers—in effect, a salary supplement. Another common strategy for public-school teachers to augment their salary is to provide private lessons (Brehm 2016; Nguon 2012). If less than 2% of primary school and lower-secondary school students were attending a private school, 13.6% of primary school students and 46.9% of lower-secondary school students were taking private lessons in 2014 (National Institute of Statistics 2015). Overall, the estimated annual educational costs were $78.5 per primary school student, $152 per lower-secondary school student and $303.5 per upper-secondary school student in 2014. This compares to an average income per capita just under $1,000 per year, of which, on average again, $700 is spent on food and housing plus

utilities alone. In terms of national averages, educational expenses may appear modest, but for many households with school-age children, they do not represent a trivial share of their income after paying for basic necessities. In 2014, less than 5% of parents cited distance from school as a reason for a 6-to-17 year-old not to attend school, but 11.0% cited being too poor, another 29.1% the need for the child to contribute to the household income and yet another 6.3% the need to contribute to the household chores (National Institute of Statistics 2015).

Until recently, the RGC only provided welfare payments to specific groups, most notably its retired civil servants and veterans of the armed forces and the national police. A large number of un-coordinated, donor-funded initiatives, projects and activities have sprung to provide additional support, but these are often limited in geographical scope and duration (International Labor Office 2012). Two of the best coordinated social protection programs concern health and education. Introduced in 2000, Health Equity Funds (HEF) have been funded through the RGC Ministry of Health by international donors and NGO, which select HEF beneficiaries and compensate their healthcare providers for lost fee revenues. They have spread widely since, though still substantially shy of the RGC's target of nationwide coverage by 2013 (Flores et al. 2013). Following a similar model, international donors and NGO began financing scholarships for poor children in 2003. Working with the RGC Ministry of Education, the scholarship program came to identify as a critical period the transition from primary to lower-secondary school, thus targeting children in the 6^{th} grade. All 6^{th} graders in any of the primary schools feeding lower-secondary schools selected by the Ministry of Education automatically apply to these scholarships. The program was found to have a significant impact on enrollment, but there was no evidence that it also affected academic achievement (Filmer & Schady 2009). Moreover, the program remains relatively small, with less than 15% of students receiving a scholarship to one of the selected schools, which themselves only represent about $1/8^{th}$ of the lower-secondary schools in the country.

The RGC has recently taken steps towards an integrated social protection system. In 2007, the RGC gradually implemented an official poverty targeting system known as the IDPoor, with households identified as poor (IDPoor 1) or extremely poor (IDPoor 2) receiving an IDPoor Card. By 2012, almost all rural areas were covered. In 2011, the RGC also created a National Social Protection Strategy (NSPS) for 2011–15, and in 2013, pilot programs started to be implemented in order to experiment with the design and delivery mechanisms for safety nets. Despite the availability of this targeting mechanism, limited fiscal revenues seriously constrain the extent of social protection that national institutions and government agencies can provide. In 2013, the World Bank estimated that the coverage of safety nets remained at only 2% of the poorest quintile of the population (World Bank 2014). A high share of the population thus continues to face serious vulnerabilities that may induce a temporary inability to face education and health expenditures. To cope, most households continue to rely primarily on their extended kin network (Kim 2011; [Authors]).

Hypotheses

Our conceptual model of children outcomes in general and educational ones in particular centers on parental time and resources as main determinants of these outcomes.

Accordingly, and as found repeatedly across diverse contexts, we expect that, after controlling for observed differences in household resources, children residing with both biological parents will have better educational outcomes than children who do not (Hypothesis 1). As widows represent a larger share of single parents with children than in Western societies, one may reasonably hypothesize that, as reported in Malaysia, Indonesia and Thailand, these differences would be smaller than typically found in those societies (Hypothesis 2a). As discussed in the previous section, however, when the data used in this study were collected, Cambodia still very much lacked the type of welfare support that might be available in Western or East Asian societies. As cross-national studies have shown that these safety nets can substantially moderate children educational differences across living arrangements, one might alternatively hypothesize that the educational gradient in Cambodia should be comparatively large (Hypothesis 2b). Finally, pragmatism with respect to living arrangements in Cambodia does not suggest that there should be strongly negative selection into multi-generational households as observed in Japan for instance. We thus expect that, similarly to what has been documented by some studies in the U.S.A. but also in Thailand, the education of children residing with a single parent would benefit from living in a multi-generational household (Hypothesis 3).

Data and Methods

In order to examine the living arrangement of children in Cambodia, this paper utilizes survey data from the Mekong Integrated Population-Registration Areas of Cambodia (MIPRAoC) project. We first describe this survey, then describe the variables constructed from these data for our analyses.

The Mekong Integrated Population-Registration Areas of Cambodia Project

The analyses presented in this paper are based on the baseline survey (2008) and the first update (2010) of the MIPRAoC health and demographic surveillance system (HDSS). The MIPRAoC project grew out of The Mekong Island Population Laboratory (MIPopLab, 2000–06; ICPSR36601-v1). Both projects include occasional, topical, “rider” social-science surveys built on a longitudinal HDSS. At the time of initial registration into the MIPopLab/MIPRAoC HDSS (benchmark census or subsequent in-migration), each household head provides for each resident household member their name (later replaced by a unique identifier), gender, birth date, relationship to the head, and parental information (on survival, current residence, or timing of death). To be enumerated as a resident, a seasonal migrant needs to have spent less than three months away from the household in the past six months and a circular migrant, such as a child attending school, to spend less than 4 nights a week away. Complete marriage and birth histories were also collected from all women between the ages of 15 and 74 ([Authors]). The MIPRAoC data originate from the original MIPopLab site and six new Population-Registration Areas (PRA), all seven located along the Mekong River, which flows through Eastern Cambodia and the capital city, Phnom Penh. The project was only designed to provide representative data for the population of the contiguous districts along the Mekong River, where 20% of the rural households in the country resided at the time of the 1998 General Population Census (National Institute of Statistics, 1999). However, comparisons between nationally-representative and MIPopLab or

MIPRAoC data have repeatedly shown little differences in marital, reproductive or household composition levels and trends ([Authors]).

The combined population at the initial registration in the six new PRA and demographic update in the original MIPopLab site was close to 60,000. Due to the recent implantation of several garment factories, the population of one of the PRA, located at the outskirts of the Phnom Penh, was much larger at the time of the baseline survey (Round 1, 2008) than in the sampling frame from the 1998 General Population Census. Only a third of this PRA was retained in the biennial demographic updates and rider survey. Consequently, the size of the population followed in the demographic updates has dropped to slightly above 50,000. Updates on residency, marital status, education and occupation were conducted in 2010, 2012, 2014 and 2016, but only data from first of these updates available at the outset of our analyses. This biennial update includes demographic records on all individuals' relationship to the household head, allowing for tracking of children's living arrangements over time.

Variables Construction

As we are concerned with the academic achievements of children, the analytic sample has been restricted to school age children (ages 6 to 17 years). Because the sample might thus include several children from the same household, we use Hierarchical Linear Models (HLM) with child characteristics as level-1 independent variables and household characteristics as level-2 independent variables. For dependent variables, we consider three measures of academic achievements reported by the head of the household or another adult household resident: 1) literacy (ability to read and write in any language), 2) school attendance (attending any formal educational institution), and 3) child's grade level relative to the expected grade for age at the time of the baseline survey. Level-1 independent variables include age groups, gender and parental survival. We use the age groups 6 to 8, 9 to 11, 12 to 14 and 15 to 17 years, corresponding to the first and second half of primary school, lower secondary and upper secondary school respectively. The proportion of MIPRAoC children (17 years and under) who are of school age (6 years and over) is 68%, and among those a majority (87%) indeed attended school, but only 73% were literate (see Table 1).

With regard to household composition, MIPRAoC captures the relationship of individuals to household heads as well as some information on their biological parents. This enables us to construct two sets of household variables. First, an indicator of the number of co-resident biological parents is created. Over 80% of children in the study lived with both biological parents. As children age, the cumulative risk of parental mortality or separation increases, and so does the prevalence of children residing with only one biological parent. However, the prevalence of co-residence with only one parent remains relatively low at 13% for children aged 6 to 17 years.

The second level-2 variable is categorical and describes living arrangements. The first category is *nuclear*: households consisting only of (single or two) parents and (biological, step or adopted/foster) children. The second category is *multigenerational* and includes households with at least one grandparent in addition to parents and children. The residual category includes all households with other members, such as extended family members or

non-relatives, and four-generational households. This residual includes only accounts for 15% of all the households in the sample, whereas the nuclear households are the most common, as they are at the national level, followed by three-generational households ([Authors]).

With respect to the determinants of child literacy, we first use a dichotomous variable for each parent's own literacy. In the MIPRAoC data, 65% of co-residing fathers and 63% of co-residing mothers of school aged children are literate (see Table 1). Several additional socio-economic variables were considered to capture some of the differences among the households children live in. The first one is the type of employment of all previously or currently employed individuals. We created five employment sectors from farming (including fishing, hunting, forestry and plantation) to crafts, industry, civil service, and white-collar or service jobs. All individuals employed in farming or crafts were also asked whether they owned the land or resources needed for their activity (e.g., boat for fishing, loom for weaving). We created four categories for property ownership, renting in exchange of payment, free usage (e.g., lending by kin), or being a laborer.

Results

We first consider school enrolment among 6- to 17-year olds. As shown in Table 2, we find the odds of being enrolled in school to be 34% lower for children residing with only one biological parent compared to children residing with both. A more surprising result is the odds ratio is a little higher for children residing with neither of their biological parents than for those residing with just one of them (odds ratios of 0.78 and 0.66 respectively relative to children co-residing with both biological parents, Table 2). This might be due to the fact that some children reside away from the parental home precisely to attend a somewhat distant school. If, controlling for living arrangements, children not residing with a biological parent thus exhibit lower odds of being enrolled in school, those who live in a family other than nuclear or multi-generational have much higher odds (+69%, Table 2). Living in a multi-generational household—a more common arrangement for children who live with only one parent rather than with both—also increases the odds of school enrolment by 21% compared to nuclear households. Living arrangements thus appear to have a strong moderating effect on the impact of separation from one or both biological parents on school enrolment.

To further control for parental characteristics (literacy, occupation, land/craft-tool ownership), we limited the next analyses to children residing with at least one parent. Table 2 also presents estimates of the odds of school enrolment controlling for maternal characteristics for children residing with their biological mother, with or without a co-resident biological father and similar estimates controlling for paternal characteristics for children residing with their biological father, with or without a co-resident biological mother. Controlling for maternal characteristics further reduces the odds ratio of school enrolment between children residing with or without a biological father, but only slightly: the odds ratio decreases to 0.60 down from 0.66. For children residing with their biological father, the odds ratio of school enrolment decreases further to 0.56 when they do not co-reside with their biological mother compared to when they do. The positive estimates of the effects of living arrangements other than nuclear or multi-generational remain largely

unchanged by the addition of parental characteristics in the model, whereas the estimates for the effects of living in a multigenerational household are reduced and lose significance. Among the parental characteristics accounted for in these models, literacy and non-farming occupations have strong positive association with children's school attendance. Children whose parents are employed in farming are less likely to be in school, especially if their parents are laborers, rather than land owners or tenants. The positive effect of living in a multi-generational household estimated in the previous model is thus partially due to selection, as literate parents employed in an economic sector other than agriculture are more likely to live in such households ([Authors]). Also notable across models is the absence of significant gender differences in school attendance.

For children who were attending school, we next examined whether they were at the expected grade for their age. With our dependent variable—the difference between the actual and the expected highest grade completed by the child's age—being now continuous rather than dichotomous, we followed the same strategy as for school attendance. Namely, we first compared children co-residing with two parents, only one parent or none, then we compared children residing with their mother and children residing with their father with those residing with both. In Table 3, we observe similar differences by parental co-residency as we do for school enrolment. Children residing with only one parent are on average 0.23 grade below those residing with both parents at the same age, and those not residing with any parent a little lower still (0.28 grade below on average). Before controlling for parental characteristics, we again find strong moderating effect for other than nuclear living arrangements. Living in a multi-generational household raises the expected grade by 0.16 while in other living arrangements the expected increase is 0.25 grade. Combining the estimated effects of parental absence and of living in a non-nuclear household, children residing with only one parent in these living arrangements are expected to be very nearly in the same grade on average as children residing with both parents in a nuclear household. Once we control for the characteristics of the resident parent for children living with at least one of their parents, we see the same pattern as with school attendance. For children residing with their biological mother, the effects seem to be very similar to those estimated in the previous model (0.24-grade difference between those who also reside with their father and those who do not). For children residing with a biological father, the difference is much more substantial, more than half a grade (0.53-grade difference between those who also reside with their mother and those who do not). As in the school-attendance models, the effects of living arrangements are attenuated by the inclusion of parental characteristics, but less so. The coefficients for other living arrangements are reduced in half but remain significant (at $p<.05$ in the model with co-resident mothers, $p<.1$ in the model with co-resident fathers). Adding the characteristics of the resident parent, we now find that children residing with only one of their parent in a multi-generational household are in lower grade on average that those residing with both parents in a nuclear-family household, especially if the absent parent is the mother.

The literacy of the co-resident parent has equally strong positive effects on the child's grade-for-age in the models with mother present and in those with father present. We also observe strong positive effects of the resident parent's occupation. As with school attendance, children whose parents are engaged in crafts or civil service fare better that those whose

parents are employed in the agricultural sector, but this advantage no longer applies to those whose parents are employed in the industrial sector or even hold a white-collar job. Contrary to the comparable school-attendance models, children whose parents are renting their land or the resources needed for their crafts are at a further disadvantage compared to owners of land or such resources. As in those models, children whose fathers are laborers also fare worse, but we do not observe the same disadvantage for children whose mothers are laborers.

Another notable difference with the school-attendance models is that we find a gender difference in grade for age, with girls being about a quarter of a grade above same-age boys across the three models. Overall, we also confirm how common grade repetition is in Cambodia, with 9 to 11 year-olds being on average one year below their expected grade compared to 6 to 8 year-olds, and 12 to 14 year-olds being an additional year below their expected grade. In other words, the average child only moves up two grades every three years.

Last, we consider the educational proficiency of all children between the ages of 6 and 17 years as assessed by their literacy. Unfortunately, literacy is only reported as a dummy variable and our models are thus similar to those for school enrolment. In these models, however, the effects of living arrangements are generally smaller than in the previous two sets of models and none of them are significant. For the model including all children, the odds of literacy for children co-residing with only one of their biological parents is 20% lower than for those co-residing with both (Table 4). More surprisingly in this model, children who reside with neither of their parents have the better odds of being literate than those residing with both, even though again the odds ratio is not significant. We typically expect negative selection into residing with neither parent, but there might be some positive selection as well, such as if parents send the children who are doing better in school to stay with relatives in order to facilitate their further studies.

Controlling for parental characteristics, we find again that an absent mother reduces the odds of literacy twice more than an absent father (0.54 versus 0.76, Table 4). As in the grade-for-age models, parental literacy and employment in either crafts or civil service are the parental characteristics most associated with higher odds literacy, whereas a father employed as a laborer in agriculture is associated with lower odds. We again find gender differences in favor of girls, whose odds of literacy are about 25% higher than those of boys across models. Also of note, the age gradient only flattens after age 11 (between the age groups 12 to 14 & 15 to 17), indicating a protracted process of becoming literate. The odds of being literate among 9 to 11 year-olds are only one sixth of the odds among 12 to 17 year-olds.

Discussion

Our analyses of the effects of not residing with a biological parent, or not residing with either biological parent, on children’s school enrolment, grade-for-age and literacy reveal some similarities with the effects that have been well documented in high-income Nations. Consistent with our Hypothesis 1, we find the odds of being in school for children residing with their biological mother but not with their biological father to be 40% lower than for

those residing with both biological parents, and when they are in school the former are enrolled in a lower grade on average. Their odds of being literate are also 24% lower than their peers residing with both parents. Compared with children residing with both parents, the observed disadvantage of residing with only one parent appears to be up to twice larger across these indicators when the absent parent is the child's mother rather than the child's father—a finding consistent with earlier research (e.g., Llyod & Blanc 1996). Relatedly, we find school enrollment increases when mothers are literate and employed in a sector other than farming, which might correlate with a greater influence on familial decisions.

With respect to Hypotheses 2a & 2b, we estimated differences in grade-for-age between Cambodian children residing with only one versus both of their parents amounting to 0.13 of a SD (0.23 over 1.75, Tables 1 & 3) in a model without parental characteristics, and barely changes (0.14 of a SD, 0.24 over 1.75) when some maternal characteristics are added. The literacy gradient is comparatively larger, amounting to roughly half of a SD (0.23 over .44, Tables 1 & 4) before and nearly two thirds of a SD (0.27 over .44) after maternal characteristics are introduced. By this metric, differences in Cambodia appear to be within the range of those found in a number of high-income Nations as reviewed in our Background section. Contrary to what has been suggested elsewhere in Southeast Asia (Malaysia, Indonesia and Thailand), we do not find that a relatively high proportion of widows among parents that do not live with their children's other parent produces a smaller educational gradient. In fact, all three outcomes are worse for children not living with their father when the father is deceased (even though the differences are not significant). Our results are more consistent with the hypothesis that the relative lack of welfare support at the time tends to produce relatively large educational gradients. In this respect, the future impact of the RGC's steps towards a more comprehensive and integrated social protection system will deserve further analysis.

As indicated in the background section, educational expenses may account in some households for a sizable portion of the household's disposable income left after purchasing basic necessities. Although we are limited in our ability to assess household's financial situation, we find that socio-economic indicators are positively associated with children's school attendance and grade-for-age. This likely explains in part the evidence we find in support of Hypothesis 3 that, consistent with results in the U.S.A., living in a multi-generational households substantially moderate the potentially negative effects of residing with no or only one parent. Anecdotal evidence suggests that parents may move into a multi-generational living arrangement to increase their own mobility and ability to respond to more remote work opportunities. On some measures, we even found that children not residing with either parent fared better than those residing with both parents, which we also attributed to the opportunistic placement of children away from home to facilitate their school attendance.

A better understanding of the selection mechanisms into the various types of living arrangements would clearly be needed to make causal claims about the effect of parental absence in Cambodia. The cross-sectional distribution of living arrangements in Cambodia may seem more similar to the same distribution in the U.S.A. than expected. Nuclear living arrangements dominate in Cambodia too. The main difference there is a high level of

flexibility and fluidity, for children as well as for adults. Whereas in the West, except in rare circumstances, parents' identical treatment of siblings seems to be the norm, many Cambodian parents readily admit to providing differently to children that they perceive as having different abilities and personalities from birth (Smith-Heffner 1999). In Cambodia, accounting for the endogeneity of children's living arrangements would thus require controlling not just for parents' characteristics, as is common in studies in the West, but for children's characteristics as well—a point that had also emerged from the earlier literature of child fosterage. Not yet available at the time of this writing, additional data from subsequent MIPRAoC rounds will allow longitudinal analyses to account for some of the effects of child characteristics and, in particular, for the strategic placement of certain children away from the parental household.

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Table 1:

Child, Parents and Household Characteristics, Descriptive Statistics

	All Children		Ages 6 to 17		Ages 6 to 14[a]		
Variables	***M***	***SD***	***M***	***SD***	***M***	***SD***	**Range**
Female child	.49	.50	.49	.50	.50	.50	0 – 1
Under age 6	.32	.47	--	--	--	--	0 – 1
Ages 6 to 8	.16	.37	.24	.43	.26	.44	0 – 1
Ages 9 to 11	.16	.37	.24	.42	.34	.47	0 – 1
Ages 12 to 14	.18	.38	.26	.44	.40	.49	0 – 1
Ages 15 to 17	.18	.38	.26	.44	--	--	0 – 1
Child attending school	--	--	.87	.33	1.00	.00	0 – 1
Actual minus expected grade	--	--	--	--	−0.98	1.75	−8 – 12
Child literacy	--	--	.73	.44	--	--	0 – 1
Nuclear household	.61	.49	.63	.48	.63	.48	0 – 1
Multigenerational household	.23	.42	.22	.41	.22	.41	0 – 1
Two co-resident parents	.84	.37	.81	.39	.82	.38	0 – 1
Only one co-resident parent	.11	.31	.13	.33	.12	.32	0 – 1
Co-resident mother: Literate	.64	.48	.63	.48	.65	.48	0 – 1
Employed in farming, hunting or fishing	.38	.49	.40	.49	.40	.49	0 – 1
Employed in crafts	.11	.32	.12	.32	.13	.33	0 – 1
Employed in industry	.04	.19	.03	.17	.03	.17	0 – 1
Employed in service sector	.18	.38	.18	.38	.18	.39	0 – 1
Employed in civil service	.02	.13	.02	.13	.02	.14	0 – 1
Co-resident mother employed in farming, hunting or fishing, or in crafts and who is: Owner	.36	.48	.38	.49	.39	.49	0 – 1
User for free	.02	.13	.02	.12	.02	.12	0 – 1
User for fee/rent	.06	.23	.06	.23	.06	.24	0 – 1
Paid laborer	.06	.24	.06	.24	.06	.24	0 – 1
Co-resident father: Literate	.69	.46	.66	.47	.69	.46	0 – 1
Employed in farming, hunting or fishing	.45	.50	.45	.50	.45	.50	0 – 1
Employed in crafts	.03	.18	.03	.16	.03	.18	0 – 1
Employed in industry	.05	.21	.04	.19	.04	.19	0 – 1
Employed in services	.21	.10	.18	.39	.19	.39	0 – 1
Employed in civil service	.09	.29	.09	.29	.10	.30	0 – 1
Co-resident father employed in farming, hunting, fishing, or in crafts and who is: Owner	.38	.48	.38	.49	.39	.49	0 – 1
User for free	.02	.13	.01	.11	.01	.11	0 – 1
User for fee/rent	.07	.25	.07	.25	.07	.25	0 – 1
Paid laborer	.03	.16	.02	.14	.02	.14	0 – 1
N	22,032		15,010		9,491		

Source: Authors' calculations

Note:

[a] School-Attending children only

Table 2:

Summary of Hierarchical Regression Analysis for Variables Predicting School Enrolment for All Children Ages 6 to 17 (n=14,016), Those Residing With Their Mother (n=13,776) and Those Residing With Their Father (n=12,315)

	All Children (Ages 6 to 17)			Children Residing With Their Mother			Children Residing With Their Father		
Predictor	***β***	***SE***	***OR***	***β***	***SE***	***OR***	***β***	***SE***	***OR***
Female child	0.06	0.08	1.07	0.07	0.08	1.07	0.14	0.09	1.16
Ages 9 to 11	3.02**	0.13	20.49**	3.01**	0.14	20.21**	3.16**	0.15	23.53**
Ages 12 to 14	3.65**	0.15	38.46**	3.63**	0.15	37.86**	3.82**	0.17	45.49**
Ages 15 to 17	3.16**	0.14	23.51**	3.11**	0.14	22.53**	3.34**	0.16	28.21**
Deceased mother	0.49	0.32	1.64	-	-	-	−0.30	0.81	0.74
Deceased father	−0.08	0.23	0.93	−0.37	0.29	0.69	-	-	-
Multi-generational household	0.19	0.14	1.21	0.04	0.15	1.04	0.12	0.15	1.13
Other households	0.53**	0.15	1.69**	0.47*	0.16	1.59*	0.54*	0.19	1.71*
No co-resident parent	−0.24	0.22	0.78	-	-	-	-	-	-
Only 1 co-resident parent	−0.41†	0.20	0.66†	−0.52†	0.24	0.60†	−0.58	0.71	0.56
Parent is: Literate				1.47**	0.11	4.37**	1.55**	0.14	4.73**
Employed in crafts				1.31**	0.20	3.71**	1.25**	0.37	3.49**
Employed in industry				0.97	0.57	2.63	1.00	0.51	2.73
Employed in services				1.03†	0.51	2.80†	0.75	0.46	2.11
Employed in civil service				2.67**	0.76	14.45**	1.46*	0.49	4.29*
Sector unknown				0.87	0.52	2.38	−0.06	0.53	0.94
Parent is: User for free				−0.01	0.40	0.99	0.01	0.45	1.01
User for fee/rent				0.17	0.23	1.19	0.19	0.22	1.20
Paid laborer				−0.79**	0.20	0.46**	−0.67†	0.33	0.51†
Ownership unknown				−0.76	0.51	0.47	−0.36	0.46	0.70
Hh. level variance (ψ)		6.16			5.44			5.94	
Intra-class correlation (ρ)		0.65			0.62			0.64	
Model fit *(−2LL)*		4,515.62			3,987.02			3,557.42	

Source: Authors' calculations.

Note: The parental characteristics are those of the child's mother in Column 2 and of the child's father in Column 3. All models also include a non-significant interaction term between household types and parental survival. The reference categories are male child, ages 6 to 8, living in a nuclear household with both biological parents, parent is not literate, employed in farming, hunting, fishing or in crafts and is the owner of the land/crafts equipment. Ownership is only assessed for parents employed in farming, hunting, fishing or in crafts.

† p<0.1.

* p<0.05.

** p<0.01.

Table 3:

Summary of Hierarchical Regression Analysis for Variables Predicting Actual Minus Expected Grade for Age for All Children Aged 6 to 14 (n=9,399), Those Residing With Their Mother (n=8,705) and Those Residing With Their Father (n=7,863)

	All Children (Ages 6 to 17)		Children Residing With Their Mother		Children Residing With Their Father	
Predictor	***B***	***SE(B)***	***B***	***SE(B)***	***B***	***SE(B)***
Female child	0.23**	0.03	0.23**	0.03	0.25**	0.03
Ages 9 to 11	−1.01**	0.03	−1.00**	0.03	−0.98**	0.03
Ages 12 to 14	−1.92**	0.03	−1.88**	0.03	−1.86**	0.03
Deceased mother	0.27†	0.12	--	--	0.28	0.29
Deceased father	0.02	0.08	−0.07	0.10	--	--
Multi-generational household	0.16**	0.05	0.13*	0.05	0.12†	0.05
Other households	0.25**	0.05	0.13*	0.05	0.12†	0.05
No co-resident parent	−0.28**	0.08	--	--	--	--
Only one co-resident parent	−0.23**	0.07	−0.24*	0.08	−0.53†	0.26
Parent is: Literate			0.73**	0.04	0.70**	0.05
Employed in crafts			0.72**	0.05	0.44**	0.09
Employed in industry			−0.10	0.19	0.00	0.17
Employed in services			0.11	0.17	0.09	0.15
Employed in civil service			0.83**	0.21	0.57**	0.16
Sector unknown			−0.05	0.18	−0.18	0.18
Parent is: User for free			−0.00	0.14	0.03	0.15
User for fee/rent			−0.23*	0.07	−0.15†	0.07
Paid laborer			−0.02	0.07	−0.39**	0.12
Ownership unknown			0.38†	0.17	0.33†	0.15
Hh level variance (ψ)	0.94		0.73		0.74	
Intra-class correlation (ρ)	0.45		0.40		0.40	
Model fit *(−2LL)*	16,289.57		14,678.69		13,238.50	

Source: Authors' calculations.

Note: See footnote to Table 2.

Table 4.

Summary of Hierarchical Regression Analysis for Variables Predicting Literacy for All Children Ages 6 to 17 (n=14,008), Those Residing With Their Mother (n=13,778) and Those Residing With Their Father (n=12,308)

	All Children (Ages 6 to 17)			Children Residing With Their Mother			Children Residing With Their Father		
Predictor	***β***	***SE***	***OR***	***β***	***SE***	***OR***	***β***	***SE***	***OR***
Female child	0.18*	0.07	1.20*	0.21*	0.07	1.24*	0.24*	0.08	1.27*
Ages 9 to 11	3.41**	0.11	30.32**	3.46**	0.12	31.72**	3.60**	0.13	36.44**
Ages 12 to 14	5.19**	0.14	179.37**	5.29**	0.16	198.34**	5.49**	0.17	242.29**
Ages 15 to 17	5.17**	0.15	176.34**	5.27**	0.16	194.29**	5.55**	0.18	256.82**
Deceased mother	0.42	0.27	1.52	-	-	-	−0.36	0.72	0.70
Deceased father	0.14	0.19	1.14	−0.19	0.24	0.82	-	-	-
Multi-generational household	0.15	0.12	1.16	0.09	0.12	1.09	0.12	0.13	1.13
Other households	0.15	0.12	1.17	−0.03	0.13	0.98	0.02	0.14	1.02
No co-resident parent	0.07	0.18	1.07	-	-	-	-	-	-
Only one co-resident parent	−0.23	0.17	0.80	−0.27	0.20	0.76	−0.61	0.64	0.54
Parent is: Literate				1.83**	0.10	6.26**	1.85**	0.13	6.39**
Employed in crafts				1.13**	0.15	3.11**	1.04**	0.27	2.84**
Employed in industry				0.07	0.47	1.07	0.60	0.44	1.82
Employed in services				0.34	0.42	1.41	0.14	0.40	1.16
Employed in civil service				1.61*	0.55	5.02*	0.83†	0.42	2.30†
Sector unknown				0.23	0.43	1.26	0.03	0.47	1.03
Parent is: User for free				0.43	0.34	1.54	0.08	0.39	1.08
User for fee/rent				0.10	0.18	1.10	0.28	0.18	1.32
Paid laborer				0.14	0.18	1.15	−0.48	0.29	0.62
Ownership unknown				−0.05	0.42	0.95	0.24	0.40	1.27
Hh level variance (ψ)		5.12			4.44			5.00	
Intra-class correlation (ρ)		0.61			0.57			0.60	
Model fit *(−2LL)*		6,103.84			5,330.64			4,774.47	

Source: Authors' calculations.

Note: See footnote to Table 2.