

RESEARCH ARTICLE

Household structure and child education in Cambodia

Patrick Heuveline* and Savet Hong

California Center for Population Research (CCPR), University of California, Los Angeles (UCLA)

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. The extant record is both thinner and more contrasted, however. 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, possibly resulting from negative effects for some children and positive selection for some others.

Keywords: *education; family demography; global/international; household structure; single parents*

ARTICLE INFO

Received: March 9, 2017
Accepted: April 20, 2017
Published Online: April 26, 2017

***CORRESPONDING AUTHOR**

Patrick Heuveline
California Center for Population
Research (CCPR)
4284 Public Affairs Bldg
University of California, Los
Angeles (UCLA)
Los Angeles, LA 90095
heuveline@soc.ucla.edu

CITATION

Heuveline P and Hong S
(2017).
Household Structure and
Child Education in Cambodia.
*International Journal of
Population Studies*, 3(2): 1-15.
doi: [10.18063/ijps.v3i2.309](https://doi.org/10.18063/ijps.v3i2.309).

Copyright: © 2017 Heuveline P and Hong S. This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), permitting all noncommercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

1. Introduction

In this paper, we analyze the effects of household structure and children's living arrangements on their 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 in sub-Saharan Africa (*e.g.*, Bledsoe, 1990; Isiugo-Abanihe, 1985; Madhavan, 2004; Nyamukapa and Gregson, 2005), there had been comparatively little research on the topic in medium- and low-income Nations, until recently at least. 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), it suffices to say that non-marital partnership formation and parental divorce have become more common in some South American and East Asian countries (Esteve, Lesthaeghe and López-Gay, 2012; Raymo, Hyunjoon, Yu *et al.*, 2015). Substantial numbers of children residing with only one or none of their biological parents have thus emerged in these regions. Moreover, work opportunities in urban and peri-urban areas, or even abroad, attract an increasing number of short-term and "circular" migrants. Among them, some parents temporarily, though durably sometimes, must leave their children behind (Collinson, Tollman, Kahn *et al.*, 2006; Parreñas, 2015). Parents may then leave their children with family members, grand-

parents in particular (Safman, 2003).

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, as well as the 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 did a few previous studies in these settings, we note some "anomalies" with respect to children residing with neither of their biological parents.

1.1 Literature Review

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 those may very well affect their child's wellbeing regardless of whether 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 vs. other types of 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 who do not (among many reviews of this large literature, see, for instance, McLanahan, Tach and Schneider, 2013).

A strain of comparative work across Western societies has also documented institutional effects on how children fare across different living arrangements (Cooke and 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, in all countries, the average educational performance of children who live with both of their biological parents is higher than the average educational performance of those who do not—a typical pattern referred to as the "educational gradient" thereafter. Within countries, this educational gradient tends to increase slightly with age, but its magnitude varies markedly between countries. In multiple studies, gradients were found to be larger in the U.S.A. than in any other country included in the analyses, for instance, 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 that may use different parental characteristics as control variables. Using data on TIMSS "population1" 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, Dronkers and Hampden-Thompson, 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, Yang and Timberlake, 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, Martin Garcia and Dronkers, 2007; Hampden-Thomson, 2013; Marks, 2006).

In a systematic analysis of TIMSS data in non-Western societies, Schiller, Khmelkov and Wang, (2004) find 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. Several country-specific analyses have replicated results from high-income countries regarding the advantage of children living with both parents (*e.g.*, most recently, Chae, 2016). Other studies have obtained mixed results or even produced findings to the contrary. Evidence of a reversed gradient indicates that the cultural context matters with respect to, for instance, whether and to which extent some living arrangements are stigmatized, and which children may be selected into particular living arrangements. Without delving into this country-specific literature (see DeRose, Corcuera Garcia, Salazar *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 residing with only one or no biological parent. In the West, researchers may have paid attention to the differences between non-marital childbearing and divorce, or more rarely, between divorce and widowhood in the West (*e.g.*, Biblarz and Gottainer, 2000). In many low- and medium-income countries, parental mortality remains high (Beegle, De Weerd and Dercon, 2009; Birdthistle, Floyd, Nyagadza *et al.*, 2009; Case and Ardington, 2006; Evans and Miguel, 2007; Gertler, Levine and Ames, 2004) and parental migration is becoming more

prevalent (Kandel and Kao, 2001; Kuhn, 2006; Yao and Treiman, 2011; Nobles, 2011; Townsend, Madhavan, Tollman *et al.*, 2002). These different pathways into single-parent-headed households may produce different effects on the children in these households. 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) reports 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) finds students in single-parent families to outperform their peers in intact families. Strong norms against never-married or divorced parents imply that 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.

Prior research in the U.S.A. has shown that children living with a single mother may benefit from the additional presence of grand-parents (*e.g.*, DeLeire and Kalil, 2002). Huisman and Smits (2009) obtain similar results in their comparative study of low- and middle-income countries. Reduced when one of the biological parents is absent, a child's enrollment chances appear to increase when living in an extended family, especially one with grandparents. For Thailand, Mahaarcha and Kittisuksathit, (2009) also showed the positive effect of having grandparents, in the household, on school enrollment for adolescents. These results are consistent with the additional resources grand-parents contribute, both economic and social (*i.e.*, Coleman's (1988) inter-generational closure). In Japan, however, Shirahase and 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 households, since such norms imply highly-negative selection into multi-generational households.

1.2 The Cambodian Context

1.2.1 Household Structure and Children's Living Arrangements

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 and 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. 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 and 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. Heuveline and Hong (2016) 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 and 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 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; Heuveline and Hong, 2016). Correspondingly, the dominant living arrangement is nuclear, with a preference for uxori-locality. However, Cambodian households can be quite pragmatic in their living arrangements and young couples routinely depart from the uxori-local norm, for instance, if economic opportunities are available near the groom's parents (Demont and 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), however, clearly exceeds what it would be were married couples to live in this 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 (Heuveline and Hong, 2016), as urban households are more frequently solicited to take in rural relatives who want to pursue work or education opportunities in the city.

1.2.2 Education and Social Welfare

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, reaching 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 enrollment in first grade and grade repetition are both common. National statistics suggest that less than half of the 7th 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). Nevertheless, more than half of the youths in these cohorts still fail to 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. 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 (Heuveline and Hong, 2016).

Unfortunately, the RGC has not made a similar commitment to supporting these schools' operating costs and their teachers' salaries (Ayres, 2000; Brehm, 2016). Public schools' tuition and fees are low, but their students are expected to buy their own textbooks and supplies, as well as to contribute to some of the school's running expenses, such as building maintenance funds, and to "give" to their teachers a small amount of money daily—in effect, a salary supplement. Another common strategy for public-school teachers to augment their salary is to provide additional lessons for a fee, often in public-school classrooms (Brehm, 2016; Nguon, 2012). While 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, in 2014, 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. 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 represent more than a trivial share of what is left 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 up 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, Por, Chean *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 the transition from primary to lower-secondary school as a critical period, thus targeting children in the 6th grade. All 6th graders in any of the primary schools that feed 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 and 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 1/8th 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; Heuveline and Hong, 2016).

1.3 Conceptual Framework and Hypotheses

Based on the framework developed in Heuveline, Yang and Timberlake, (2010) to study international differences in the effects of children's living arrangements on their educational outcomes, we conceptualize living arrangements as operating through the "quality" and "quantity" of parenting available to children. Even though the involvement of the non-residential parent(s) may vary, living with only one or no biological parent is expected to reduce the quantity of parenting. Single parents' own parenting might be affected, as research documents the "time deficit" they experience when parenting alone (Hill, Yeung and Duncan, 2001; Bianchi, Robinson and Milkie, 2006). The additional stress associated with single parenting and poor communication between parents living apart might also affect the quality of parenting. Accordingly, and as repeatedly reported across diverse contexts in the literature reviewed above, we expect children residing with both biological parents to have better educational outcomes than children who do not, even after controlling for observed differences in household resources (Hypothesis 1).

However, this conceptual framework also emphasizes that parents draw the resources their children need from a larger environment that includes not just the labor market but also governmental programs that may be in place to support families with children. Following Pong, Dronkers and Hampden-Thompson (2003), we expect that family policies that equalize resources between different types of families reduce the educational gradient. Moreover, public funding for education may reduce the impact that differences in resources have on educational outcomes. As discussed in the previous section, at the time 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. This would lead us to hypothesize that the educational gradient in Cambodia should be larger than average in Western societies (Hypothesis 2a).

Another important aspect of the larger context in which households operate, albeit difficult to measure precisely, is the cultural environment which affects, in particular, the extent to which less traditional households are stigmatized or supported by their communities. Results reviewed above from Malaysia, Indonesia, or Thailand showed smaller than expected differences in outcomes that might be linked to the relatively large share of non-stigmatized widows among the single parents with children. Similarly for Cambodia, one may alternatively hypothesize that the educational gradient should be smaller than average in Western societies (Hypothesis 2b).

The most direct form of communal support is arguably multi-family household formation, allowing for different families to share a substantial amount of resources and time, and for parenting to be provided by adult co-residents other than the biological parents. As documented in Safman (2003) for Thailand, and equally valid for Cambodia, grand-parents are parents' preferred "social" parents in the event they cannot take care of their children themselves. As reviewed above, studies have generally found that children not living with one or both of their biological parents fare better in multi-generational households (with at least one grand-parent present). Results to the contrary have been attributed to a strong negative selection into such households when these represent a strong deviation from the norm. As a great deal of tolerance and pragmatism with respect to living arrangements has been reported in Cambodia, we expect that more favorable educational outcomes for children living in multi-generational households than for those of children living in other household structures (Hypothesis 3).

2 Data and Methods

This paper utilizes survey data from the Mekong Integrated Population-Registration Areas of Cambodia (MIPRAoC) project. The MIPRAoC project grew out of The Mekong Island Population Laboratory (MIPopLab, 2000–2006; ICPSR36601-v1). Both projects include occasional, topical, "rider" social-science surveys built on a longitudinal health and demographic surveillance system (HDSS). The analyses presented in this paper are based on the baseline survey (2008) of the MIPRAoC HDSS. We first describe this survey, then describe the variables constructed from these data and our

analytical strategy.

2.1 Study Population

The target population of the baseline survey consisted of residents from six new Population-Registration Areas (PRA), in addition to all residents from the original MIPopLab site.

All seven PRA are located along the Mekong River, which flows through Eastern Cambodia and the capital city, Phnom Penh. To be enumerated as a resident, a seasonal migrant needs to have spent less than three months away from the household in the preceding six months and a circular migrant, such as a child attending school, needs to have spent less than 4 nights a week away. 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 (Heuveline and Hong, 2016).

The combined population—at initial registration in the six new PRA and after demographic update in the original MIPopLab site—was close to 60,000. Due to the recent establishment 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. The response rate was 96.3% in this PRA and 99.1% elsewhere (averaging 98.4%). The seemingly high response rate is in fact typical of social surveys conducted in the country (e.g., National Institute of Statistics, 2015).

Overall, the MIPRAoC is representative of the Mekong River Valley households in Cambodia and follows the national trends. Unlike existing nationally representative surveys, the MIPRAoC is designed to be a longitudinal data collection project, where the ongoing data collection will enable researchers to examine the long-term impact of household compositions. This paper examines the initial census of the seven PRA, which contained 14,989 children under the age of 18 across 7,205 households.

2.2 Analytical Strategy

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 siblings from the same household, we use Hierarchical Linear Models (HLM) with each child's characteristics as level-1 independent variables and (possibly shared) household characteristics as level-2 independent variables. Among these variables are the parental characteristics described below. Because parental characteristics are only available when the parent co-resides with her child, models with parental characteristics are estimated on two sub-samples: a sub-sample of children co-residing with their mother (with or without their father) and a sub-sample of children co-residing with their father (with or without their mother).

2.3 Measurements

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, parental information (on survival, current residence, or timing of death), marital status, literacy, education, and occupation.

2.3.1 Outcomes

For dependent variables, we consider three measures of academic achievements reported by the head of the household or another adult household resident: 1) literacy (self-reported 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.

2.3.2 Individual-Level Covariates

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](#)).

2.3.3 Household-Level Covariates

Table 1. Child, parents and household characteristics, descriptive statistics

Variables	All children		Ages 6 to 17		Ages 6 to 14 ^a		Range
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
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

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 (Table 1).

The second level-2 variable is categorical and describes household structure. 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 category 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 (Heuveline and Hong, 2016).

Level-2 covariates also included parental characteristics. 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 parents. We created five employment sectors, namely farming (including fishing, hunting, forestry, and plantation), 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, etc.). We created four categories for property: ownership, renting in exchange of payment, free usage (e.g., lending by kin), or being a laborer.

3. Results

3.1 School Enrollment

We first consider school enrollment 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

Table 2. Summary of hierarchical regression analysis for variables predicting school enrollment for all children ages 6 to 17 ($n = 14,016$), those residing with their mother ($n = 13,776$) and those residing with their father ($n = 12,315$)

Predictor	All children (Ages 6 to 17)			Children residing with their mother			Children residing with their father		
	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.

† $p < 0.1$. * $p < 0.05$. ** $p < 0.01$.

(difference significant at the 10% level only). A more surprising result is the odds ratio for children residing with neither of their biological parents (odds ratios of 0.78 relative to children co-residing with both biological parents, and not significantly different from one). This might be due to the fact that some children reside away from the parental home precisely to attend a somewhat distant school. Consistent with this scenario, we find that children who live in a household structure other than nuclear or multi-generational have much higher odds to be in school (+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 enrollment compared to nuclear households, but only by 21% (non-significant difference).

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 enrollment 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, the odds ratio of school enrollment for children residing without their biological father is slightly reduced compared to children residing with their biological father—from 0.66 to 0.60, difference still significant at the 10% level only. For children residing with their biological father, the odds ratio of school enrollment for children residing without relative to children residing with their biological mother is even lower (0.56, but the difference is not significant due to the small number of children not living with their mother). The estimated odds ratios corresponding to household structures other than nuclear or multi-generational remain largely unchanged by the addition of parental characteristics in the model (from 1.69 for all children to 1.59 for children living with their mother and 1.71 for children living with their father). 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 paid laborers, rather than land owners or tenants. Also notable across models is the absence of significant gender differences in school attendance.

3.2 Grade for Age

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 both biological parents to those co-residing with only one biological parent and to those not residing with their parents; then we compared children residing with both parents to children residing with their biological mother and children residing with their biological father. In **Table 3**, we observe similar differences by parental co-residency as we do for school enrollment. 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

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 ($n = 7,863$)

Predictor	All Children (Ages 6 to 17)		Children Residing With Their Mother		Children Residing With Their Father	
	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.

below on average). However, we again find that these effects might be counter-balanced by residing in a non-nuclear household structure. Living in a multi-generational household raises the expected grade by 0.16 and the expected increase is even higher—0.25 of a grade—when living in another type of non-nuclear household structure (*i.e.*, Other households type). Combining the estimated effects of parental absence and of living in a non-nuclear household, children residing with only one parent in these household structures 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 estimates are very similar to those of 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), albeit significant only at the 10% level due to the small number of children not living with their mother. As in the school-attendance models, the effects of household structures are attenuated by the inclusion of parental characteristics. The coefficients for multi-generational household structures hardly change though, while the coefficients for other household structures are reduced in half. (Again, coefficients in the model with co-resident fathers are only significant at the 10% level). 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 than 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 models, children whose parents are engaged in crafts or civil service fare better than those whose parents are employed in the agricultural sector. As in those models, children whose fathers are paid laborers also fare worse, but we no longer observe the same disadvantage for children whose mothers are paid laborers.

Another notable difference with the school-attendance models is that we now 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.

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 ($n = 12,308$)

Predictor	All children(Ages 6 to 17)			Children residing with their mother			Children residing with their father		
	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.

3.3 Literacy

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 enrollment. In these models, however, the effects of living arrangements and household structure are generally smaller than in the previous two sets of models and none of them are significant. For the model including all children, for instance, 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 significantly different from one. This may either indicate no effect or a combination of negative effects for some children and positive effects for some other children. While we typically expect negative selection for not residing with any parent, some positive selection is possible as well. For instance, parents may send those children that are doing better in school, to stay with relatives in order to facilitate their further studies.

Controlling for parental characteristics, we find again that parental literacy and employment in either crafts or civil service are the parental characteristics most associated with higher odds of literacy. We again find gender differences in favor of girls, whose odds of literacy are 20% to 27% higher than those of boys across models. Also of note, the age pattern 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.

4. Discussion

Our analyses of the effects of residing with only one or no biological parent on children's school enrollment, 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, but this difference is not significant. 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, and 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 and 3) in a model without parental characteristics, and barely changed (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 and 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 living with only one parent due to the death of the other parent reduces the educational gradient. In fact, none of the coefficients for parental survival are significant and if anything the odds of being in school and literate are lower for children not living with their father when the father is deceased. While educational gradients have been found to be smaller in poor Nations than in rich ones, our results are more consistent with the hypothesis that the relative lack of welfare support at the time of the survey contributed to produce relatively large educational gradients in this low-income Nation. 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, grade-for-age, and literacy (parents employed in non-agricultural sectors and when farming, not as paid laborers). 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 improves children's educational outcomes. 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 may also be 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 household structure would clearly be needed to make causal claims about the effect of parental absence in Cambodia. The cross-sectional distribution of household structures in Cambodia may seem more similar to the same distribution in the U.S.A. than expected. The nuclear household structure dominates in Cambodia too. The main difference 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.

Acknowledgments

The authors benefited from facilities and resources provided by the California Center for Population Research at UCLA (CCPR), which receives core support from the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD). The authors also acknowledge direct support from NICHD through a 2007–2014 research grant to the first author. This research grant has provided major support to the Mekong Integrated Population-Registration Areas of Cambodia (MIPRAoC) project, which provided the data analyzed in this paper. MIPRAoC integrates the activities and extant data of The Mekong Island Population Laboratory (MIPopLab), which received major support from NICHD through a 2002–2005 research grant to the first author. The transition from MIPopLab to MIPRAoC was supported by a 2005 seed grant to Alan Kolata and the first author from the Population Research Center, NORC and the University of Chicago, through its NICHD infrastructure grant. Additional support has been provided by a 2014–2015 seed grant to Adriana Lleras-Muney, Manisha Shah and the first author from the CCPR, a 2015–2016 pilot project award to the first author from the University of Southern California/University of California-Los Angeles Biodemography Center, which receives core support from the National Institute on Aging (NIA), and a 2017 fellowship to the first author from the Center for Khmer Studies.

In addition to the above institutions and individuals, the first author gratefully acknowledges advising from Colm O'Muircheartaigh for the design of MIPRAoC. From 2005 to 2014, Poch Bunnak has served as the MIPRAoC project manager. Since 2007, Samuel J. Clark oversees the database management of the project, with the assistance of Jeffrey Eaton and Benjamin Clark. Dwight Davis also contributed to the coding and cleaning of the data files.

While they remain solely responsible for the content of this paper, the authors also wish to thank Wei-Jun Jean Yeung, Hyunjoon Park, Shannon Cavanagh, Rachel Goldberg, and the participants of the UCLA Sociology Family Working Group for suggestions made on an earlier version of this paper.

Authors' Contribution

Patrick Heuveline designed the study, supervised the analyses and drafted the first draft of the manuscript. Savet Hong prepared the data and conducted the analyses. The authors jointly revised the manuscript.

Conflict of Interest

The authors report no conflict of interest.

Ethics Approval

Ethics approval for the MIPRAoC Project has been obtained by the Internal Review Board of the University of California, Los Angeles (IRB#11-002684) and from the National Ethics Committee for Health Research of the Ministry of Health, Royal Government of Cambodia (#83NECHR). Consent was obtained from all human subjects in the study.

Grant Numbers and Funding Information

Research grant R01HD054618 (Heuveline, P.I.) from the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD); California Center for Population Research, UCLA infrastructure grant R24HD041022 (Pebbley, P.I.) from NICHD; University of Southern California/University of California-Los Angeles Biodemography Center infrastructure grant P30AG017265 (Seeman and Crimmins, P.I.) from the National Institute on Aging (NIA);

Senior Fellowship from the Center for Khmer Studies.

References

- Ayres DM (2000). Tradition, modernity, and the development of education in Cambodia. *Comparative Education Review*, 44(4): 440–462. <http://doi.org/10.1086/447629>.
- Beegle K, De Weerd J and Dercon S (2009). Orphanhood and human capital destruction: Is there persistence into adulthood? *Demography*, 47(1): 163–180. <http://doi.org/10.1353/dem.0.0094>
- Bianchi SM, Robinson JP and Milkie MA (2006). *Changing Rhythms of American Family Life*. New York: Russell Sage.
- Biblarz TJ and Gottainer G (2000). Family structure and children's success: A comparison of widowed and divorced single-mother families. *Journal of Marriage and the Family*, 62(2): 533–548. <http://doi.org/10.1111/j.1741-3737.2000.00533.x>.
- Birdthistle I, Floyd S, Nyagadza A, *et al.* (2009). Is education the link between orphanhood and HIV/HSV-2 risk among female adolescents in urban Zimbabwe? *Social Science and Medicine*, 68(10): 1810–1818. <http://doi.org/10.1016/j.socscimed.2009.02.035>
- Bledsoe C (1990). The social management of fertility: Child fosterage among the Mende of Sierra Leone. In Handwerker WP (editors). *Births and power: Social change and the politics of reproduction* (pp. 81–101). Boulder, CO: Westview Press.
- Brehm WC (2016). The contemporary landscape of education in Cambodia. In Brickell K and Springer S (editors). *The handbook of contemporary Cambodia* (pp.271–282) Abingdon, United Kingdom, and New York: Routledge.
- Case A and Ardington C (2006). The impact of parental death on school outcomes: Longitudinal evidence from South Africa. *Demography*, 43(3): 401–420. <http://doi.org/10.1353/dem.2006.0022>.
- Chae S (2016). Parental divorce and children's schooling in rural Malawi. *Demography*, 53(6): 1743–1770. <http://doi.org/10.1007/s13254-016-0521-7>
- Chea H and Sok H (2001). The Cambodian garment industry. *Cambodia Development Review*, 5(3): 1–8.
- Coleman J (1988). Social capital in the creation of human capital. *American Journal of Sociology*, 95: S95–S120. <http://doi.org/10.1086/228943>.
- Collinson MA, Tollman SM, Kahn K, *et al.* (2006). Highly prevalent circular migration: Households, mobility and economic status in rural South Africa. In Tienda M, Findley SE, Tollman SM, *et al.* (editors.). *Africa on the move: African migration and urbanisation in comparative perspective* (pp. 194–216). Johannesburg, South Africa: University of the Witwatersrand Press.
- Cooke LP and Baxter J (2010). “Families” in international context: Comparing institutional effects across Western societies. *Journal of Marriage and Family*, 72(3): 516–536. <http://doi.org/10.1111/j.1741-3737.2010.00716.x>.
- Das D (2016). “Enrollment, educational expenditures and work among one-parent children in India.” *Marriage and Family Review*, 52(1–2): 196–215. <http://doi.org/10.1080/01494929.2015.1073652>.
- DeLeire T and Kalil A (2002). Good things come in 3's: Multigenerational coresidence and adolescent adjustment. *Demography*, 39(2): 393–413. <http://doi.org/10.1353/dem.2002.0016>.
- Demont F and Heuveline P (2008). Diversity and change in Cambodian households, 1998–2006. *Journal of Population Research*, 25(3): 287–313. <http://doi.org/10.1007/BF03033892>.
- Derks A (2008). *Khmer women on the move: Exploring work and life in urban Cambodia*. Honolulu: University of Hawaii Press.
- DeRose L, Corcuera Garcia P, Salazar A, *et al.* (2014). Household structure and school attendance in 67 Countries: Why children with absent fathers do better in some places. Paper presented at the 2014 meetings of the Population Association of America, May 1–3, Boston, MA.
- Ear S (2011). Growth in the Rice and Garment Sectors. In Hughes C and Un K (editors) *Cambodia's economic transformation* (pp.70–93). Copenhagen, Denmark: Nordic Institute of Asian Studies.
- Ebihara M (1968). *Svay : A Khmer village in Cambodia*, doctoral thesis. New York: Columbia University Press.
- Esara P (2012). Moral scrutiny, marriage inequality: Cohabitation in Bangkok, Thailand. *The Asia Pacific Journal of Anthropology*, 13(3): 211–227. <http://doi.org/10.1080/14442213.2012.680486>.
- Esteve A, Lesthaeghe R and López-Gay A (2012). The Latin American cohabitation boom, 1970–2007. *Population and Development Review*, 38(1): 55–81. <http://doi.org/10.1111/j.1728-4457.2012.00472.x>.
- Evans D K and Miguel E (2007). Orphans and schooling in Africa: A longitudinal analysis. *Demography*, 44(1): 35–57. <http://doi.org/10.1353/dem.2007.0002>.

- Filmer D and Schady N (2009). School enrollment, selection and test scores. Washington, D.C.: World Bank.
- Flores G, Por I, Chean RM, *et al.* (2013). Financial protection of patients through compensation of providers: The impact of Health Equity Funds in Cambodia. *Journal of Health Economics*, 32(6): 1180–1193. <http://doi.org/10.1016/j.jhealeco.2013.09.012>.
- Garib G, Martin Garcia T and Dronkers J (2007). Are the effects of different family forms on children's educational performance related to the demographic characteristics and family policies of modern societies? In Moerbeek H, Niehof A and van Ophem J (editors). *Changing families and their lifestyles* (pp.27–50). Wageningen, The Netherlands: Wageningen Academic.
- Gertler P, Levine DI and Ames M (2004). Schooling and parental death. *The Review of Economics and Statistics*, 86(1): 211–225. <http://doi.org/10.1162/003465304323023769>.
- Hampden-Thompson G (2013). Family policy, family structure, and children's educational achievement. *Social Science Research*, 42(3): 804–817. <http://doi.org/10.1016/j.ssresearch.2013.01.005>.
- Heuveline P and Hong S (2016). One-parent families in contemporary Cambodia. *Marriage & Family Review*, 52(1–2): 216–242. <http://doi:10.1080/01494929.2015.1076553>.
- Heuveline P and Poch B (2006). Do marriages forget their past? Marital stability in post-Khmer-Rouge Cambodia. *Demography*, 43(1): 99–125. <http://doi.org/10.1353/dem.2006.0005>.
- Heuveline P, Yang H and Timberlake JM (2010). It takes a village (or perhaps a Nation): Family structures, State policies and children's educational achievement. *Journal of Marriage and Family*, 72(5): 1362–1376. <http://doi.org/10.1111/j.0022-2445.2004.00088.x>.
- Hill M, Yeung W and Duncan G (2001). Childhood family structure and young adult behaviors. *Journal of Population Economics*, 14: 271–279. <http://doi.org/10.1007/s001480000>.
- Hoefinger H (2013). Sex, love and money in Cambodia: Professional girlfriends and transactional relationships. Abington, United Kingdom and New York: Routledge.
- Huisman J and Smits J (2009). Effects of household-and district-level factors on primary school enrollment in 30 developing countries. *World Development*, 37(1): 179–193. <http://doi.org/10.1177/2158244015609666>.
- International Labour Office (2012). Cambodia: Social protection expenditure and performance review. Geneva, Switzerland: International Labour Office.
- Inter-university Consortium for Political and Social Research [distributor]. 2017. The Mekong Island Population Laboratory (MIPopLab), A Demographic Surveillance System in Rural Cambodia (2000-06). ICPSR36601-v1. Ann Arbor, MI: ICPSR, 2017-04-13. <http://doi.org/10.3886/ICPSR36601.v1>
- Isiugo-Abanihe UC (1985). Child fosterage in West Africa. *Population and Development Review*, 11(1): 53–74.
- Kandel W and Kao G (2001). The impact of temporary labor migration on Mexican students' educational aspirations and performance. *International Migration Review*, 35(4): 1205–1231. <http://doi.org/10.1111/j.1747-7379.2001.tb00058.x>.
- Kim S (2011). Reciprocity: Informal patterns of social interaction in a Cambodian Village. In J. Marston (Ed.) *Anthropology and community in Cambodia: Reflections on the work of May Ebihara* (pp.153–69). Victoria, Australia: Monash Asia Institute.
- Kuhn R (2006). The effects of fathers' and siblings' migration on children's pace of schooling in rural Bangladesh. *Asian Population Studies*, 2(1): 69–92. <http://doi.org/10.1080/17441730600700572>.
- Lloyd CB and Blanc AK (1996). Children's schooling in sub-Saharan Africa: The role of fathers, mothers, and others. *Population and Development Review*, 22(2): 265–298.
- Loenzien M de (2016). Lone motherhood and its educational outcomes for children in Vietnam. *Marriage and Family Review*, 52(1–2): 162–195. <http://doi.org/10.1080/01494929.2015.1136859>.
- Madhavan S (2004). Fosterage patterns in the age of AIDS: Continuity and change. *Social Science & Medicine*, 58(7): 1443–1454. [http://doi.org/10.1016/S0277-9536\(03\)00341-1](http://doi.org/10.1016/S0277-9536(03)00341-1).
- Mahaarcha W and Kittisuksathit S (2009). Impact of family structure, parental migration, and parental divorce on an adolescent's educational enrollment: Evidence from a longitudinal study in Kanchanaburi province, Thailand. *Journal of Population and Social Studies*, 18(1): 1–22.
- Marks GN (2006). Family size, family type and student achievement: Cross-national differences and the role of socioeconomic background and schools. *Journal of Comparative Family Studies*, 31(1): 1–24.
- McLanahan S, Tach L and Schneider D (2013). The causal effects of father absence. *Annual Review of Sociology*, 39: 399–427.
- Ministry of Education, Youth and Sports. 1997. Education statistics, 1996–1997. Phnom Penh, Cambodia: RGOC, UNESCO, and

UNDP.

- National Committee for Population and Development (2009). *Migration and development in Cambodia*. Phnom Penh, Cambodia: The Office of the Council of Ministers and United Nations Population Fund.
- National Institute of Statistics (1999). *General population census of Cambodia 1998: Final census results*. Phnom Penh, Cambodia: Ministry of Planning.
- Nguon S. 2012. Parental involvement and students' achievement in Cambodia: Focusing on parental resourcing of public schooling. *International Journal of Educational Research*, 53: 213–24. <http://doi.org/10.1016/j.ijer.2012.03.011>.
- Nobles J (2011). Parenting from abroad: Migration, nonresident father involvement, and children's education in Mexico. *Journal of Marriage and Family*, 73(4), 729-746. <http://doi.org/10.1111/j.1741-3737.2011.00842.x>.
- Nyamukapa C and Gregson S (2005). Extended family's and women's roles in safeguarding orphans' education in AIDS-afflicted rural Zimbabwe. *Social Science and Medicine*, 60(10): 2155–2167. <http://doi.org/10.1016/j.socscimed.2004.10.005>
- Park H (2007). Single parenthood and children's reading performance in Asia. *Journal of Marriage and Family*, 69(3): 863–877. <http://doi.org/10.1111/j.1741-3737.2007.00410.x>.
- Parreñas RS (2005). *Children of global migration: Transnational families and gendered woes*. Stanford: Stanford University Press.
- Pong SL (1996). School participation of children from single-mother families in Malaysia. *Comparative Education Review*, 40(3): 231–249. <http://doi.org/10.1086/447383>.
- Pong SL, Dronkers J and Hampden-Thompson G (2003). Family policies and children's school achievement in single-versus two-parent families. *Journal of Marriage and Family*, 65(4): 681–699. <http://doi.org/10.1111/j.1741-3737.2003.00681.x>.
- Planning MO (2015). *Cambodia socio-economic survey 2014*. Phnom Penh, Cambodia: Ministry of Planning.
- Raymo JM, Hyunjoon P, Yu X, *et al.* (2015). Marriage and family in East Asia: Continuity and change. *Annual Review of Sociology*, 41: 471–492. <http://doi.org/10.1146/annurev-soc-073014-112428>.
- Safman RM (2003). Assessing the impact of orphanhood on Thai children affected by AIDS and their caregivers. *AIDS Care*, 16(1): 11–19. <http://doi.org/10.1080/09540120310001633930>.
- Schiller KS, Khmelkov VT and Wang XQ (2004). Economic development and the effects of family characteristics on mathematics achievement. *Journal of Marriage and Family*, 64(3): 730–742. <http://doi.org/10.1111/j.1741-3737.2002.00730.x>.
- Shirahase S and Raymo JM (2014). Living arrangements and poverty among single mothers in Japan. *Social Forces*, 93(2): 545–569. <http://doi.org/10.1093/sf/sou077>.
- Smith-Hefner NJ (1999). *Khmer Americans: Identity and moral education in a diasporic community*. Berkeley: University of California Press.
- Townsend N, Madhavan S, Tollman S, *et al.* (2002). Children's residence patterns and educational attainment in rural South Africa, 1997. *Population Studies*, 56(2) : 215–225. <http://doi.org/10.1080/00324720215925>.
- van de Kaa DJ (1987). Europe's second demographic transition. *Population Bulletin* 42(1): 1–59. Washington, D.C.: Population Reference Bureau.
- World Bank (2014). *Where have all the poor gone? Cambodia poverty assessment 2013*. Washington, D.C.: World Bank.
- Xenos P and Kabamalan MM (2007). Emerging forms of union formation in the Philippines. *Asian Population Studies*, 3(3): 263–286. <http://doi.org/10.1080/17441730701746417>.
- Yao L and Treiman DJ (2011). Migration, remittances and educational stratification among blacks in apartheid and post-apartheid South Africa. *Social Forces*, 89(4), 1119–1143. <http://doi.org/10.1093/sf/89.4.1119>.