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RELATIVES IN RESIDENCE: RELATEDNESS OF HOUSEHOLD MEMBERS DRIVES SCHOOLING DIFFERENTIALS IN MOZAMBIQUE

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Abstract

Children typically receive investments from their fathers, but absent fathers often invest at low levels. In fathers' absence, what types of non-fathers invest heavily in children? This paper investigates educational participation as a reflection of childhood investments on Ibo Island, Mozambique, where only one third of school-aged children live with their biological fathers. Father-present children generally attended school at the highest rates. Stepchildren and father-absent relatives (e.g. grandchildren, nieces) attended school at comparably high rates if any co-residing children were father-present. This may signal high altruism among present fathers toward some non-offspring. Consistent with this result, a fixed-effects model indicates that, within the same household, adult males invested equally in their own children, relatives, and stepchildren. However, prejudicially lower investments were made in children who were unrelated to the household's adult males; this result has strong negative implications for the wellbeing of African children who are fostered by non-relatives.

Keywords

African families; Education; Family structure; Fathers; Fixed effects models

Adults make monetary and time-based investments in children's quality for a variety of reasons, including altruism, old age security (Becker, 1992), and the evolutionary drive to protect their genetic relatives (W. D. Hamilton, 1964). Often, children receive their principal monetary investments from their biological fathers, although the degree to which fathers feel driven to invest may vary meaningfully with their presence in the household. A nonresident father may invest little in his children because he feels reduced altruism toward them (a potential consequence of reduced interactions), he does not expect them to support him in his old age, or he has developed a close relationship with the children of a new partner (Cox, 2007). These drivers explain the frequently observed association between paternal absence from the household and negative outcomes for children in both Western (Anderson, Kaplan, & Lancaster, 1999; Case, Lin, & McLanahan, 1999; Emmott & Mace, 2014) and African (Anderson, Kaplan, Lam, & Lancaster, 1999; Clark & Hamplová, 2013; Ntoimo & Odimegwu, 2014; Thiombiano, LeGrand, & Kobiané, 2013) contexts.

When fathers are absent, others typically do not invest in children at levels high enough to fully mitigate the negative impacts of paternal absence. One framework for understanding

the low investments made by non-fathers in the children with whom they co-reside is family structure theory. According to this theory, role ambiguity in a foster or blended household and the associated feeling that resource allocation is not one's own responsibility (Bledsoe, Ewbank, & Isiugo-Abanihe, 1988; Cherlin & Furstenberg Jr, 1994) can contribute to reduced investments in father-absent children (defined here as children whose fathers do not live in the household). In spite of these structural challenges in father-absent households, researchers have identified scenarios in which alternative father figures, such as adoptive fathers or stepfathers, invest highly enough to close the gap associated with father absence (Gibson, 2009; L. Hamilton, Cheng, & Powell, 2007; Hofferth & Anderson, 2003).

In this paper, I ask whether Mozambican children in all types of father-absent households receive comparable investments, or if relatedness through blood or marriage dictates the level of investment. An adult's willingness to invest in the children with whom he co-resides may be driven by his genetic closeness to that child, in accordance with kin selection theory (Cox, 2007; L. Hamilton et al., 2007; W. D. Hamilton, 1964). Kin selection theorists argue that a biological father (who shares half his genes with a child) feels twice as strongly to invest as does a biological grandfather or uncle, each of whom shares only a quarter of his genes with that child. Moreover, a non-relative (e.g. a stepfather or non-biologically related uncle) will lack this drive to invest altogether. Under kin selection theory, one would expect to see a relatedness-driven hierarchy in childhood investment outcomes, in which the highest investments are made in father-present children, followed by children living with non-paternal relatives, followed by children living with non-relatives. In an investigation of Sub-Saharan African orphans, Case et al.'s (2004) results were largely consistent with this pattern: children were enrolled in school at lower rates when they were more distantly related or unrelated to their household heads.

Within this kin selection framework, special attention must be paid to the role of gender in shaping household members' investment preferences and abilities. On the one hand, maternal and paternal presence might be expected to have similar impacts on the level of investments a child receives. After all, mothers—like fathers—share half their genes with their offspring, so they might feel comparably driven to invest in their children. However, investment behavior is dictated by preferences, earning potential, bargaining power, and spending autonomy, all of which can be associated with one's gender (Akashi-Ronquest, 2009; Gummerson & Schneider, 2013; Lloyd & Blanc, 1996; Lundberg & Pollak, 1996; Luz & Agadjanian, 2015). In contexts in which women make the majority of decisions regarding household investments in children, a father's principal influence on childhood investment levels may be through the impact of his earnings on household-level resources. On the other hand, in contexts in which women have less spending autonomy, a mother of half-siblings may prefer to invest in all of her children equally regardless of paternity, but her ability to actualize that preference may be impeded by her position within the household (Akashi-Ronquest, 2009; Lundberg & Pollak, 1996) or by her new partner's hostility to her children from a previous relationship (Case et al., 1999; Daly & Wilson, 1980, 1988). Under such circumstances, preferential investments will be shown to children whose fathers are present in the household, regardless of the mother's desire to buffer this effect. If mothers have weak household bargaining power, father absence in particular (regardless of mother presence)

will drive the investment trends, and a fostered child may be no worse off than a stepchild who lives with his mother.

In contrast to the scenario described above, a stepfather or other individual with a strong, familiar relationship with his co-residing children may choose to invest highly in them. After all, an individual's stepchildren, like his biological offspring, are potential providers of old-age support and security against risk (Allen-Arave, Gurven, & Hill, 2008), impact his relationship with his current partner (Anderson, Kaplan, & Lancaster, 1999), and might drive him to feel truly altruistic. African stepfathers and the consequences of maternal remarriage in Africa have only recently begun to receive researchers' specific attention, in stark contrast to the level of attention paid to closely associated themes, such as African child fostering (Bledsoe et al., 1988; Case et al., 2004; Isiugo-Abanihe, 1985) and female-headed households (Kennedy & Haddad, 1994; Luz & Agadjanian, 2015; Onyango, Tucker, & Eisemon, 1994).

Investigations relating to household structure and childhood investments are of particular importance in Africa, where households are often complex, father absence is often the norm, and childhood investments are often low. In Mozambique, for example, fewer than half of adolescents live with their fathers, and 8.9% of percent of adolescents have never attended school (Mozambican National Institute of Statistics, Mozambican Ministry of Health, & ICF International, 2013). In these contexts, much remains unknown regarding how relatedness drives household investment behaviors. Case et al. (2004) made a strong case for kinship-driven investments across Sub-Saharan Africa, but the authors did not investigate whether stepfathers behave like biological fathers or non-relatives when investing. This question holds great relevance because of regional remarital norms. Throughout Sub-Saharan Africa, divorce and widowhood are often followed by remarriage in quick succession (Bongaarts, Frank, & Lesthaeghe, 1984), which, in combination with high rates of pre-marital fertility (Garenne and Zwang, 2006), can lead to high prevalence of child fostering (Grant & Yeatman, 2014) and high rates of half- and stepsibling relationships. Understanding the drivers of investments in African children therefore requires better comprehension of the preferential and prejudicial investment behaviors shown toward offspring, relatives, stepchildren, and other non-relatives.

Among the growing literature investigating divorce, remarriage, and single motherhood in Africa (Chae, 2013; Clark & Hamplová, 2013; Gaydosh, 2015; Ntoimo & Odimegwu, 2014; Thiombiano et al., 2013), two particularly interesting studies have found parental remarriage (i.e. stepfathers) to be associated with comparable or worse outcomes for children (Chae, 2013; Clark & Hamplová, 2013) versus remaining unmarried. However, each of these studies identified methodological challenges that limited the researchers' causal interpretations: findings may have been driven by length of time since divorce (Chae, 2013) or by adverse events that preceded the remarriage (Clark & Hamplová, 2013). Causality regarding the importance of father presence in the home is even more difficult to discern in across-household studies. In such models, results can be biased by omitted household-level variables, such as altruism or differential access to resources. If, for instance, single-mother households or complex, blended households are especially resource-constrained (Case et al., 2004; Ntoimo & Odimegwu, 2014; Thomson, Hanson, & McLanahan, 1994), father absence

may be only a correlate—and not a driver—of low childhood investments. I therefore employed a within-household approach (Case et al., 2004; Hofferth, 2006), which allowed me to separate prejudicial favor toward one's biological children (so-called "parental solicitude") from household-level factors, such as poverty. Further, I selected an outcome variable that reflects present-day, rather than accumulated, investments in children (Case et al., 2004) in order to measure current investment behaviors as opposed to previous hardships.

Much of the literature regarding African fathers and childhood investments identifies mechanisms (e.g. increased maternal spending autonomy, remittances, and continued ties between absent fathers and their offspring) through which father absence can have a neutral or even positive impact on children's outcomes (Clark, Cotton, & Marteleto, 2015; Kennedy & Haddad, 1994; Lu & Treiman, 2011; Luz & Agadjanian, 2015; Madhavan, Richter, Norris, & Hosegood, 2014; Madhavan, Townsend, & Garey, 2008; Onyango et al., 1994; Yabiku, Agadjanian, & Cau, 2012; Yabiku, Agadjanian, & Sevoyan, 2010). Such research enriches the discipline's understanding of the complex intersections between cultural norms, labor migration, and children's wellbeing. That said, the findings are of limited relevance in regions where father absence is, truly, a detrimental household constraint. A multi-country study by DeRose (2014) underscores the degree to which labor migration and other contextually specific forces complicate the relationship between paternal presence and children's wellbeing: the author identified opposing associations, in which living with two biological parents was associated with an educational advantage in some countries but an educational disadvantage in others.

Working with two complete censuses from Mozambique's Ibo Island community, I investigated whether co-residence with certain types of household members (i.e. adult male relatives, stepfather, or other adult male non-relatives) predicted receipt of above-average investments in comparison with other father-absent children, thereby buffering the negative outcomes associated with father absence. I approached this question by determining whether children received lower educational investments (as measured by school enrollment) when they were not biologically related to the household's adults. I then repeated the analyses while accounting for whether children's households were "non-blended" (i.e. either exclusively father-present or exclusively father-absent) or "blended" in order to consider household-level conditions (e.g. altruism, resource constraints) that may have impacted investments and been associated with blended status. Finally, I used household fixed effects to compare outcomes for co-residing children (e.g. stepsiblings, half-siblings, cousins, or unrelated children) within the same household; this approach allowed me to observe preferential and prejudicial behavior while controlling for household-level constraints (Case et al., 2004; Hofferth, 2006).

The results verified the existence of a strong positive association between father presence and educational enrollment. Children, and especially male children, generally fared best when their fathers were at home and worst when they lived without adult male relatives. These findings are consistent with kin selection theory and the results from Case et al.'s 2004 investigation of orphans, even though—unlike an orphan's deceased father—the majority of Ibo's absent fathers were alive and, in many cases, still living within the

approximately one-square-mile Ibo community, ostensibly capable of providing their offspring with financial support. Interestingly, stepchildren's enrollment was comparable to that of father-present children who lived within the same home, providing no evidence that stepfathers showed parental solicitude toward their own biological children. Taken together, these results have strong negative implications for the wellbeing of children who are fostered by non-relatives.

DATA

Data Collection and Coding

In 2009, the Ibo Foundation, a non-governmental philanthropic organization, conducted a complete census of Ibo Island, located in northern Mozambique's Quirimbas Archipelago. Censuses were conducted in Kimwani or Portuguese by trained enumerators in respondents' homes. Because enumerators returned repeatedly to non-responding households over the course of the data collection efforts, the coverage rate was believed to be 100%, and the response rate was 100%. Each household (defined by sharing of meals) was assigned a unique Household ID, and each resident was assigned a unique Individual ID. Polygynous males (only 3.4% of adult males on Ibo, data not shown) were designated as "present" in multiple households.

Children were linked to the IDs of their parents and/or co-residents in two ways. Firstly, kinship data recorded each household member's relationship to the household head. Secondly, the IDs and locations of each child's biological parent were recorded. In cases of two or more persons bearing no familial relationship to the household head and lacking a parental relationship with one another, it was generally impossible to discern the kinship structure between these co-residing individuals. In the case of temporary absence, classification of a parent's presence in the home might depend on respondents' interpretation of residency; the data collection instrument did not define a period of absence to constitute non-residence.

In 2012, with local enumerators and the support of the Ibo Foundation, I oversaw a second complete census of the population. As in 2009, I believe the coverage rate to be 100%, and the response rate was 100%. Upon completion of data collection, I retrospectively linked individuals' 2012 and 2009 responses. Linking individuals longitudinally was challenging because names and birthdates were reported inconsistently. Because this investigation is cross-sectional in nature, the effect of incomplete linking is believed to be minimal, marginally impacting my ability to cluster standard errors for children observed during both census years and to control for household educational attainment (see "Control Variables" below).

Measures

Children's relationship to the household's adult males—As diagrammed in Figure 1, I grouped children into five mutually exclusive categories based upon their relationship to the adult males with whom they co-resided: "father," "adult male relatives," "stepfather," "adult male non-relatives (no stepfather)," and "no adult males." The hierarchical nature of

this classification scheme means that children who lived with both an adult male relative(s) and a stepfather were placed within the “adult male relatives” category, reflecting my expectation—grounded in kin selection theory—that adult male relatives are likelier than stepfathers to invest highly in co-residing father-absent children. Here and throughout this paper, the terms “related” and “relative” represent biological relatedness; males who were related to children through non-biological routes (e.g. marriage, adoption) have been classified as non-relatives.

Although similar in approach to the classification scheme used by Case et al. (2004), I designated each child’s relationship to any of the household’s adult males—rather than to the household head—to account for the possibility that investment responsibility was spread among multiple adults within a single household. This methodological decision is supported by the fact that within 17.7% of Ibo’s multi-child households, different children relied upon different primary financial supporters (data not shown); therefore, relationship to the household head does not necessarily represent relationship to a child’s primary financial provider.

In accordance with kin selection theory, a child might receive higher investments if he or she lives with, for example, a related uncle (who shares one quarter of the child’s genes) than with an adult male cousin (who shares one eighth of the child’s genes). However, because of a low number of observations in the “adult male relatives” category, I did not divide this group into sub-categories on a relatedness gradient. Instead, these children can be seen as, on average, less related to household adult male(s) than children whose fathers were present; full brothers are an exception who may have biased differences toward zero.

A child whose father has died is likely to receive fewer paternal investments than the child of a labor migrant. Without separating father-absent children by the cause of father absence and because I did not control for mother’s current marital status, I failed to capture the gradient of father-absent children’s hardship. However, preliminary analyses (data not shown) pointed to statistically indistinguishable educational outcomes for father-absent children regardless of father’s status (i.e. living vs. dead) or location (i.e. within vs. outside of the community). Because of a low number of observations in sub-groups, I did not subdivide the father-absent children into categories of absence type. The results therefore provide information about father absence in general but do not describe outcomes associated with specific causes of father absence.

Blended households—As outlined in Figure 2, I define blended households as those meeting both of the following criteria: (a) one or more school-aged child was father-present, and (b) one or more school-aged child was father-absent. “Non-blended” households were either exclusively father-present or exclusively father-absent.

Education (outcome) variable—In each census wave, children’s current educational participation status (“enrolled” in school or “not enrolled”) was recorded, as was their highest level of educational attainment. In this study context, current school enrollment poses two clear advantages in comparison with alternative outcome variables (e.g. grade for age). First, it represents current investment behavior (Case et al., 2004), regardless of prior

household characteristics that influenced late school entry or slow progress between grades. In a community where children often progress slowly through school, withdrawal from and subsequent re-enrollment in school is common. On Ibo, approximately 20% of 10–14-year-olds who were not enrolled in school in 2009 were enrolled in 2012 (data not shown), demonstrating that prior non-enrollment need not preclude a child from future school participation. Second, this measure is presumably less noisy than grade-for-age measures, which can be impacted by inaccurate identification of a child's grade or age.

I define “school-aged” as 6–15 years of age. Ibo offers education through the 10th grade, after which individuals who continue their studies must move to the mainland. This type of move does not impact 15-year-olds, who are too young to have completed 10th grade. One hundred children of unknown ages (data not shown) were dropped from analysis because it was unclear whether they were school-aged. If this biased the dataset toward children from more stable households, the results may understate the true association between household structure and educational outcomes.

Control variables—Formal education was largely unavailable to the Ibo population prior to the 1970s, so educational attainment of the household head was constrained by age (i.e. heads of tri-generational households generally had zero years of educational attainment, despite there being educated individuals among the household's younger adults). Because I expect that the educational attainment of a parent, who is not necessarily the household head, can influence educational investments in a child, I controlled for the highest educational attainment value for each child's live-at-home parent or household head. Adults' educational attainment data were collected only in 2009, so 2012 values were based upon 2009 data for linked household members. In models controlling for educational attainment of the live-at-home parent or household head, I replaced missing values with zeroes and used a dummy indicator for missingness (678 missing values, Table 1).

In 2009 and 2012, asset ownership data were collected relating to ownership of 13 assets, goats, and poultry (data not shown). I created a value-based asset index for each household reflecting the estimated values of each asset type in 2012 USD. For households with unknown asset information, I imputed the mean rate of ownership for that asset (78 missing values, Table 1).

PLAN OF ANALYSIS

In this paper, I used three approaches to evaluate the relationship between educational participation, father presence, and other household compositional characteristics. First, logistic regression models on pooled data from both census years (2009 and 2012) estimated differences in children's educational enrollment as a function of five mutually exclusive categories defined by father/male presence (“father present,” “adult male relatives,” “stepfather,” “adult male non-relatives,” and “no adult males,” Figure 1) and their interaction with maternal presence.

Second, I modeled enrollment as a function of father/male presence and whether the child lived in a blended household (Figure 2). A logistic regression model compared educational

enrollment within nine mutually exclusive household composition categories (for children in non-blended households, each of the five relationship categories from Model 1; for children in blended households, four of the five relationship categories from Model 1; there was no category for “blended, no adult male relatives” because blended households, by definition, contained adult males). The model serves to identify whether children who lived in blended households received low-level investments, regardless of their father presence status. If so, household-level constraints in blended households—and not preferential investments in one’s biological children—may have led to the poor outcomes for father-absent children. The model also serves to identify whether children who lived in non-blended, exclusively father-absent households received lower investments than did children in blended households, despite having the same father absence status. If so, poor outcomes may have been driven by household-level conditions in non-blended, father-absent households (e.g. resource constraints, low altruism).

Finally, a fixed effects model provides an alternative approach for determining whether intra-household preferential investments in one’s own relatives were responsible for low investments in father-absent children. This model compared educational participation rates for school-aged children within the same household—perhaps step siblings, half siblings, cousins, or unrelated individuals—to the household’s adult males (Figure 1). By investigating within-household outcomes, the fixed effects model controlled for unobservable household-level characteristics that may have been omitted from the models above. Children from both blended and non-blended households were included in the fixed effects analysis.

RESULTS

Educational Enrollment

Approximately 79% of school-aged children were enrolled in school (Table 1). School tuition on Ibo costs approximately \$10 USD per child per year (comparable in value to approximately seven kilograms of fish, 100 bread rolls, or 20 hours of salaried work at one of the community’s well-paying employers), so the direct costs of school enrollment likely played a role in educational investment decisions. The indirect costs of education (e.g. a child’s reduced availability to assist with housework or sibling care) are also likely to have contributed to households’ investment decisions (Chae, 2013; Lloyd & Blanc, 1996), especially regarding children who were fostered with the intention of providing domestic support to non-relatives (Isiugo-Abanihe, 1985).

Familial Support for Children

Ibo is a largely matrilineal community, where children typically live with their mothers and/or their mothers’ kin after parental separation. Unlike in some matrilineal localities, in which the responsibility for children falls on maternal uncles or grandfathers (Medeiros, 1990 as cited in Charnley, 2000), resident fathers on Ibo are principally responsible for supporting and investing in their offspring. In fact, 99% of father-present children identified their fathers as their primary financial supporters (2012 values, data not shown). Only 7% of school-aged children received their primary financial support from individuals who lived

outside of the household (Table 1, 2012 values), providing little indication that absent maternal relatives or absent fathers had a major impact on monetary childhood investments. Data do not exist to describe the other types of childhood investments (e.g. time-based investments) made by absent fathers.

Household Composition

Most school-aged children (63%, Table 1) did not live with their fathers. A father's absence can be the result of marriage-related absence (i.e. non-marital childbearing and union dissolution), migration, death, or child fostering (Gaydosch, 2015). On Ibo Island and across Africa, the informality of marital unions and data limitations regarding ages during life events make it difficult to distinguish children born out-of-wedlock from children whose parents divorced (Chae, 2013; Clark & Hamplová, 2013). Despite these data limitations, I rejected labor migration as a major driver of paternal absence on Ibo. If I define plausible paternal labor migrants as fathers who lived outside of the Ibo community and were their children's primary financial supporters, only 1.8% of school-aged children had fathers who were plausibly labor migrants (Table 1, 2012 values). The true rate of labor migration may have been higher if remittances were a subordinate form of financial support or lower if some "labor migrants" were actually divorced fathers who continued to support their children financially. Contrary to the high frequency of financial investments by non-resident fathers in southern Mozambique (Yabiku et al., 2012) and neighboring South Africa (Clark et al., 2015; DeRose et al., 2014; Madhavan et al., 2014; Madhavan et al., 2008), fewer than 10% of Ibo's father-absent children depended on their fathers as their primary source of financial support (calculated from Table 1, 2012 values).

In neighboring Tanzania, Gaydosch (2015) identified complex associations between maternal and paternal absence, determining, for example, that children born to single-mothers faced a higher risk of subsequent maternal absence than children born into two-parent households. On Ibo Island, mother absence was common among school-aged children (41%, Table 1), though less common than father absence. The proportion of school-aged children living with neither parent (35%, Table 2) was higher than the Mozambican national average for children of similar ages (24%, ages 5–17, author's calculation, based upon Mozambican National Institute of Statistics et al., 2013).

Model 1: Father Presence and School Enrollment

Model 1 tested the impact of adult male presence on educational enrollment. Using logistic regression and pooling data from both census years, the model compared children within mutually exclusive relatedness categories (Figure 1) to those whose fathers were present. Next, this model was run separately for boys and girls to determine whether the effect of father presence varied by gender. To determine whether mother presence impacted children's outcomes, I ran a version of the model with a dummy variable for mother presence and an interaction term between mother presence and the relationship categories; I did not run this model separately for boys and girls because of low frequency of observations within some categories (Table 2).

The models incorporated a year dummy, age dummies (6–7 years, 8–10 years, and 11–13 years), sex dummy (not included in the single-sex iterations of the models), and household-level controls (number of household members, youth dependency ratio, education of the household head or at-home parent, a dummy for household education missingness, and asset ownership value). Standard errors were clustered at the individual level to account for autocorrelation between an individual's outcomes in the two census waves. Eight children of unknown educational enrollment status (Table 1) were excluded from analysis, as were an additional ten children with an ambiguous relationship to the household's adult males (Table 2).

$$\text{LOGIT}(\text{enrolled}_{it}) = \alpha + \beta_1 \text{relatives}_{it} + \beta_2 \text{step_father}_{it} + \dots + \delta_1 \text{age6, 7}_{it} + \delta_2 \text{age8, 9, 10}_{it} + \dots + \varepsilon_{it}$$

(1)

Demonstrating the high rates of fostering on Ibo, father-absent children most commonly lived without their mothers or any adult male relatives, but with at least one unrelated adult male, such as a brother-in-law, a non-biologically related uncle, or a male to whom the child was unrelated by blood or marriage (26%, calculated from Table 2 [337 of the 1297 father-absent children]). This household composition type was especially common for female children (32% of father-absent girls vs. 20% of father-absent boys, calculated from Table 2). Non-nuclear households and stepfamilies were also common: 19% of father-absent children lived without their mothers, but with at least one adult male relative; 15% lived with their mother and a stepfather (calculated from Table 2).

Father-present children attended school at higher rates (85% enrollment, Table 3) than did children who lived with an adult male relative (78%), a stepfather (75%), an adult male non-relative (73%), or no adult males (74%). Controlling for variables such as father-present children's wealthier, better-educated households (Table 3), Model 1 confirmed the significance of the educational enrollment differences. Living with adult male relatives (father or otherwise) was associated with an educational advantage for children. There was no significant difference in enrollment rates between children who lived with their fathers and those who lived with non-paternal adult male relatives ($p=.078$, Table 4), but living without any adult male relatives was associated with lower school enrollment ($p=.009$ for stepfathers, $p<.001$ for other types of unrelated adult males, and $p=.031$ for no adult males). Results varied somewhat with child's gender. Boys, for example, fared particularly poorly when living with their stepfathers (Table 4).

When mother presence was included in the model, the enrollment disadvantage for children who lived with their stepfathers was no longer significant ($p=.201$, Table 4). Consistent with the other iterations of the model, however, children who lived with unrelated adult males or in a household with no adult males were enrolled in school at below-average rates ($p=.028$ and $p=.046$, respectively). Mother presence was not associated with improved outcomes for these children ($p=.437$ and $p=.304$, respectively).

Model 2: Blended/Non-Blended Households and School Enrollment

Model 2 serves to identify whether children in father-absent households attended school at lower rates because their households were fundamentally different from other households (e.g. less altruistic, poorer). Here, I modeled children's school enrollment as a function of relationship to the household's adult males (Figure 1) and whether the household was blended or non-blended (Figure 2). I incorporated the individual- and household-level controls from Model 1 and clustered the standard errors at the individual level. Eight children of unknown educational enrollment status (Table 1) were excluded from analysis, as were an additional ten children with an ambiguous relationship to the household's adult males (Table 2).

$$\begin{aligned} \text{LOGIT}(\text{enrolled}_{it}) = & \alpha + \beta_1 \text{not. blended. relative}_{it} \\ & + \beta_2 \text{not. blended. stepfather}_{it} \\ & + \dots + \delta_1 \text{age6, 7}_{it} + \delta_2 \text{age8, 9, 10}_{it} + \dots + \varepsilon_{it} \end{aligned} \quad (2)$$

Within households, father presence was often heterogeneous: 22% of school-aged children lived in households classified as “blended” (Table 3, Figure 2). Father-present children attended school at high rates whether their households were non-blended (i.e. exclusively father-present, 83% enrollment, Table 3) or blended (84%). The model confirmed that a household's blended status had no impact on the school enrollment of father-present children ($p=.893$, Table 5), suggesting that blended households were not uniquely resource-constrained. In fact, blended households tended to have above-average asset wealth and household educational attainment (Table 3).

In blended households, children attended school at similar rates whether they lived with their fathers (84% enrollment, Table 3), adult male relatives (84%), or stepfathers (86%). In contrast, living with adult male non-relatives in a blended household was associated with very low rates of school enrollment (72%, Table 3; $p=.011$ in Wald post-estimates to test whether “father, blended” equaled “adult male non-relative, blended,” Table 5). This result suggests that educational disadvantages were driven by lack of relationship to the household's adult males—not by resource scarcities within complex, blended households.

Unlike children who lived in blended households, children who lived in exclusively father-absent (i.e. non-blended, father-absent) households were at a distinct disadvantage. For those who lived with their stepfathers, for example, school enrollment was only 71% in non-blended households, compared to 86% in blended households (Table 3). The model confirmed the significance of these differences, even after controlling for the below-average asset wealth and household educational attainment in exclusively father-absent homes (Table 3): children who lived with their stepfathers in non-blended households were significantly worse-off than father-present children ($p=.005$, Table 5), but children who lived with their stepfathers in blended households were not ($p=.901$). These data provide evidence that, in addition to the discriminatory relationship-based investments identified above, enrollment differentials were also driven, to some degree, by low investments in children who lived in exclusively father-absent homes.

Model 3: Father Presence and School Enrollment (Co-Resident Fixed Effects)

Finally, a fixed effects model explicitly investigated preferential relationship-based investments by performing analyses within each household. Model 3 determined differences in school enrollment status for co-residing children (e.g. stepsiblings, half-siblings, cousins, or unrelated children) who had differing classifications of relationship to the household's adult males. It is worth noting that in this model, father-absent children were likely—but not necessarily—older than housemates who resided with their fathers; there is no definitive relationship between age and father presence in the case of non-sibling residents (e.g. cousins). Because logistic fixed effects models drop groups that are invariant in the outcome variable, results of such a model would pertain only to school-aged children who lived in households in which some—but not all—children attended school. In order to include all school-aged children in the model, I instead performed OLS fixed effects. With OLS fixed effects models, the coefficient β measures the difference in probability of school enrollment between children in the same household.

Model 3 compared outcomes for children within four categories of relationship to the household's adult males (Figure 1, with no category for “no adult males” because this characteristic was invariant within the household). Due to low numbers of observations within some categories (Table 2), I did not run the fixed effects models separately by gender, nor did I introduce an interaction term for maternal presence. Dummy variables controlled for age and sex. No year dummies or household-level controls were included because analysis was fixed within a given household in a single year. Eight children of unknown educational enrollment status (Table 1) were excluded from the model, as were an additional ten children with an ambiguous relationship to adult household males (Table 2).

$$\begin{aligned} \text{enrolled}_{iht} - \overline{\text{enrolled}}_{ht} \\ = \alpha + \beta_1(\text{relatives}_{iht} - \overline{\text{relatives}}_{ht}) + \beta_2(\text{stepfather}_{iht} - \overline{\text{stepfather}}_{ht}) + \cdots + \delta_1(\text{age6}_{iht} - \overline{\text{age6}}_{ht}) + \cdots + \varepsilon_{it} \end{aligned} \quad (3)$$

More than 30% of multi-child households had two educational enrollment statuses (i.e. one or more school-aged child who was enrolled in school and one or more school-aged child who was not enrolled, data not shown), pointing to the high frequency with which households made unequal educational investments in children. Consistent with the analysis of blended and non-blended households described above (Table 5), the household fixed effects model suggested that, within the household, substantial favoritism was shown according to relationship to adult males (Table 6). School enrollment for “other non-related adult male(s)” children was 19 percentage points lower than for co-residing father-present children ($p < .001$, Table 6). On the other hand, children who lived with a stepfather or with adult male relatives were at no discernable disadvantage in comparison with their father-present co-residents. These results provide strong evidence that intra-household favoritism was shown to children who lived with fathers, stepfathers, or adult male relatives in comparison with co-residing children who lived with unrelated adult males.

DISCUSSION

There is great, and growing, interest in understanding how household compositions—and the associated topics of single motherhood, remarriage, and fostering—impact childhood outcomes in Africa. In a Mozambican community where children commonly live without their fathers, I identified strong associations between children's school participation and their relationship to adult males in the household. These outcomes were driven by preferential investments in one's own relatives and, to some degree, by the uniquely negative circumstance of living in a "non-blended" household in which no children's fathers were present.

Children's school enrollment was particularly high among children who lived with their biological fathers, whereas children who lived with stepfathers, other types of adult male non-relatives, or no adult males fared substantially worse (Tables 3 and 4). The magnitude and direction of results are largely consistent with kin selection theory, in which a child raised by his biological father is shown more altruism than a child raised by more distant relatives or non-relatives. A mother's presence in the home did not buffer the low educational investments made in father-absent children (Table 4), suggesting the probable existence of barriers that impacted women's ability to actualize their presumed investment preferences. Although outside the scope of this investigation, consideration of children's relationship to the non-mother adult females with whom they reside remains an important area for future study.

Unpacking the educational disadvantage for father-absent children, the association between educational enrollment and a child's relationship to adult male household members varied meaningfully with whether the household was non-blended (i.e. exclusively father-absent or exclusively father-present, Figure 2) or blended. In short, father-absent children were typically better off if they lived in blended households. Two types of father-absent children (those in the "adult male relatives" and "stepfather" categories, Figure 1) attended school at higher rates when they lived in blended households than in non-blended, exclusively father-absent households (Tables 3 and 5). Together with the results of the fixed effects model—which identified no educational disadvantage for these types of father-absent children in comparison with their co-residing father-present peers (Table 6)—prejudicial investments in one's own offspring ("parental solicitude") do not appear to be responsible for these children's somewhat low overall educational enrollment (Tables 3 and 4).

In Western societies, stepparents' parental solicitude has long been an area of interdisciplinary academic study (Case et al., 1999; Daly & Wilson, 1980; Hofferth, 2006), allowing researchers to isolate stepfathers' discriminative investment behaviors—or the lack thereof—from other confounding factors. In African contexts, however, less is known about how stepfathers invest in their stepchildren, despite the continent's high rates of divorce, remarriage, and pre-marital fertility and, therefore, the strong relevance of the topic. This study's identification of neutral within-household outcomes for stepchildren lies somewhat counter to other evidence that maternal remarriage may contribute to reduced investments over time for African children (Chae, 2013; Clark & Hamplová, 2013). However, previous researchers' ability to interpret the drivers of negative outcomes may have been confounded

by length of time since divorce (Chae, 2013) and by adverse events that preceded the remarriage (Clark & Hamplová, 2013). My analyses, in contrast, indicated that current investments in step- and biological children were comparable within the household.

Because I identified negative associations between educational enrollment and stepfathers at the community (Tables 3 and 4), but not the household (Table 6), level, it is possible that the differences were driven by uncontrolled-for conditions within step-households in the across-household models. However, a different interpretation of this finding—and one consistent with the results of the blended/non-blended analysis (Table 5)—points to a limitation of within-household studies. Fixed effects models control for household-level conditions, but they cannot detect selection into different household types. Therefore, a fixed effect model cannot detect if men who live with both step- and biological children invest highly in both types of children, whereas stepfathers who live only with stepchildren make low investments (Anderson, 2000; Hofferth, 2006). In other words, I found no evidence that stepfathers showed parental solicitude to their own offspring; rather, it appears that stepfathers who lived without any of their own biological children showed step-parental non-solicitude to their stepchildren. The same trend holds for non-paternal relatives: father-absent children who lived with adult male relatives attended school at rates comparable to co-residing, father-present children in blended households (Table 6), but they fared poorly in non-blended households (Table 5). These results suggest that resident fathers invested at relatively uniform, high levels in their children, stepchildren, and other co-residing children to whom they were related, whereas other males showed less altruism to the children with whom they lived.

Although the data provided no evidence that within-household prejudicial investments drove low investments in some types of father-absent children (i.e. children who lived with adult male relatives or stepfathers), prejudicially low investments were made in the “adult male non-relative” group of children—those who bore no biological or step-relationship to the household’s adult males (Figure 1). Children who lived with non-relatives were substantially less likely than other co-residing children to be enrolled in school (Table 6), and, providing further evidence that discriminatory investments drove this trend, these non-relative children were enrolled in school at comparably low rates whether they lived in blended or non-blended households (Figure 2, Tables 3 and 5). Therefore, father-present (or grandfather-present, uncle-present, stepfather-present, etc.) children did not fare better because they lived in uniquely wealthy or altruistic households. Rather, they received high investments because of the relationship they bore to the adult male(s) with whom they lived. Related males and stepfathers presumably advocated on these children’s behalf when school enrollment decisions were made.

Aside from prejudicial investments and low altruism in exclusively father-absent homes, there do exist other explanations for the relationship between relatedness and school enrollment, relating mainly to the endogeneity of variables. For example, financial hardship could have simultaneously led to father absence and low educational investments if father migration or mortality rates were higher among the poor. In this case, father absence would be a reflection—rather than a cause—of the household-level conditions associated with low enrollment. Likewise, the events preceding “crisis fostering,” such as parental death or

divorce, may be quite different from those preceding a household's decision to pursue "alliance and apprenticeship" fostering, in which children are fostered in order to learn a trade and/or provide domestic support to nonrelatives (Isiugo-Abanihe, 1985). In such an apprenticeship fostering scenario, what appears to have been a household's prejudicial treatment of an unrelated child may actually reflect a prior decision by the children's relatives to withdraw the child from school and place him or her in the service of others. Without data regarding the drivers of Ibo's high fostering rates, I was limited in my ability to draw causal interpretations from household composition to investments. However, the results of this investigation provide meaningful information about the outcomes associated with being raised by non-relatives, whatever the reason.

This study confirms the importance of household composition in dictating educational investments in school-aged children. The results also highlight the serious vulnerability of children who reside without adult male relatives. As economic development continues to proceed across Africa, returns to education are likely to increase, and educational investments have the strong potential to improve children's future earning power and standards of living. Beyond the negative educational outcomes experienced by African orphans who were fostered by distant or non-relatives (Case et al., 2004), I identified similarly negative outcomes among a set of father-absent children whose fathers typically continued to reside within the same small community. Household members' preferential investments that favor their own relatives and stepchildren—and disfavor the non-relatives with whom they live—may contribute to an educational underclass of African children.

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Figure 1. Dichotomous classification of school-aged children into mutually exclusive categories reflecting relationship to the household's adult males. "relatives" are biologically related to children.

Figure 2. Dichotomous classification of households into mutually exclusive “blended” or “non-blended” household categories. this classification scheme pertains to households that contain one or more school-aged child.

Table 1Descriptive Statistics for School-Aged Children ($N = 2047$)

Variables	<i>M</i>	<i>SD</i>	<i>Range</i>	<i>Obs</i>
Household education (years) ^a	4.51	3.27	0 – 13	1369
Asset wealth (2012 USD, thousands)	0.79	0.93	0 – 4.52	1969
Enrolled in school	.79	.41	0 – 1	2039
Mother absent	.41	.49	0 – 1	2047
Mother deceased	.04	.19	0 – 1	2047
Mother lives on Ibo	.16	.36	0 – 1	2047
Mother living, not on Ibo ^b	.21	.41	0 – 1	2047
Father absent	.63	.48	0 – 1	2047
Father deceased	.08	.26	0 – 1	2047
Father lives on Ibo	.28	.45	0 – 1	2047
Father living, not on Ibo ^b	.28	.45	0 – 1	2047
Primary financial provider: ^c				
Father	.40	.49	0 – 1	1159
Father absent, living	.05	.23	0 – 1	1159
Father absent, living, not on Ibo	.02	.13	0 – 1	1159
Mother	.12	.33	0 – 1	1159
Grandparent	.11	.31	0 – 1	1159
Primary financial provider absent ^c	.07	.26	0 – 1	1159

Note: 2009 and 2012 data are pooled.

^aEducation reflects years of attainment by household head or parent who lives in the household (whichever is highest).

^bIncludes parental “location unknown” values.

^cThese data were collected only in 2012.

Table 2

Household Structure for School-Aged Children ($N = 2047$)

	Children of both sexes				Male children		Female children	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Child lives with...								
Both parents	643	31.4	315	31.5	328	31.3		
Father, no mother	107	5.2	67	6.7	40	3.8		
Mother, no father, and...	572	27.9	304	30.4	268	25.6		
adult male relative(s)	187	9.1	113	11.3	74	7.1		
non-related adult males	240	11.7	121	12.1	119	11.4		
stepfather	190	9.3	94	9.4	96	9.2		
no stepfather	50	2.4	27	2.7	23	2.2		
no adult males	144	7.0	70	7.0	74	7.1		
adult males of unknown relationship ^a	1	0.1	0	0.0	1	0.1		
No mother, no father, and...	725	35.4	314	31.4	411	39.3		
adult male relative(s)	244	11.9	119	11.9	125	11.9		
non-related adult males	347	17.0	128	12.8	219	20.9		
stepfather	10	0.5	5	0.5	5	0.5		
no stepfather	337	16.5	123	12.3	214	20.4		
no adult males	125	6.1	64	6.4	61	5.8		
adult males of unknown relationship ^a	9	0.4	3	0.3	6	0.6		
Total ^b	2047		1000		1047			

Note: 2009 and 2012 data are pooled.

^aSome adult males were ambiguously related to children, such as when stepbrothers could not be distinguished from half-brothers in the dataset.

Table 3

Characteristics of School-Aged Children by Father Presence ($N = 2037^a$)

Variables	Father			Adult male relative(s)			Stepfather			Other non-related adult male(s)			No adult males		
	<i>M</i>	<i>SD</i>	<i>Obs</i>	<i>M</i>	<i>SD</i>	<i>Obs</i>	<i>M</i>	<i>SD</i>	<i>Obs</i>	<i>M</i>	<i>SD</i>	<i>Obs</i>	<i>M</i>	<i>SD</i>	<i>Obs</i>
All households															
Enrolled in school	.85	.36	747	.78	.42	428	.75	.43	199	.73	.44	387	.74	.44	268
Age (years)	9.7	2.8	750	10.1	2.9	431	10.6	2.9	200	10.7	2.8	387	10.3	2.9	269
Male	.51	.50	750	.54	.50	431	.50	.50	200	.39	.48	387	.50	.50	269
Mother present	.86	.35	750	.43	.50	431	.95	.22	200	.13	.34	387	.54	.50	269
Household education ^b	4.9	2.9	569	4.5	3.4	276	4.5	3.2	130	4.2	3.4	198	3.7	3.7	193
Asset wealth ^c	0.97	1.00	736	0.81	0.98	416	0.72	0.88	183	0.75	0.87	372	0.36	0.53	252
# Household members	7.2	2.3	750	8.6	3.7	431	6.6	2.3	200	6.6	2.7	387	5.2	2.1	269
Youth dependency ratio ^d	0.61	0.12	750	0.55	0.13	431	0.60	0.11	200	0.55	0.14	387	0.70	0.12	269
Non-blended households															
Enrolled in school	.83	.35	509	.76	.43	343	.71	.45	143	.74	.44	311	.74	.44	268
Age (years)	9.8	2.8	511	10.2	2.9	344	10.1	3.0	144	10.7	2.8	311	10.3	2.9	269
Male	.47	.50	511	.54	.50	344	.48	.50	144	.38	0.49	311	.50	.50	269
Mother present	.89	.32	511	.42	.49	344	.94	.23	144	.14	0.35	311	.54	.50	269
Household education ^b	4.7	2.8	404	4.4	3.6	221	4.4	3.2	96	4.2	3.3	158	3.7	3.7	193
Asset wealth ^c	0.94	1.02	504	0.73	0.93	334	0.68	0.88	129	0.69	0.86	300	0.36	0.53	252
# Household members	6.8	2.0	511	8.2	3.8	344	6.5	2.5	144	6.3	2.7	311	5.2	2.1	269
Youth dependency ratio ^d	0.60	0.12	511	0.54	0.14	344	0.59	0.11	144	0.53	0.14	311	0.70	0.12	269
Blended households															
Enrolled in school	.84	.37	238	.84	.37	85	.86	.35	56	.72	.45	76			0
Age (years)	9.5	2.8	239	9.9	2.9	87	11.7	2.2	56	10.9	2.8	76			0
Male	.59	.49	239	.54	.50	87	.54	.50	56	.41	.49	76			0
Mother present	.79	.40	239	.48	.50	87	.96	.19	56	.08	.27	76			0
Household education ^b	5.3	3.2	165	5.1	2.5	55	4.8	3.4	34	4.3	3.9	40			0
Asset wealth ^c	1.04	0.96	232	1.12	1.11	82	0.82	0.88	54	1.00	0.87	72			0

Variables	Father			Adult male relative(s)			Stepfather			Other non-related adult male(s)			No adult mates		
	M	SD	Obs	M	SD	Obs	M	SD	Obs	M	SD	Obs	M	SD	Obs
# Household members	8.1	2.6	239	9.9	3.1	87	6.8	1.9	56	7.4	2.5	76			0
Youth dependency ratio ^d	0.63	0.10	239	0.59	0.09	87	0.63	0.08	56	0.62	0.11	76			0

Note: 2009 and 2012 data are pooled.

^aTen individuals who have ambiguous relationships to all adult males in the household are excluded from table.

^bEducation reflects years of attainment by household head or parent who lived in the household (whichever was highest).

^cAsset wealth reflects thousands of 2012 USD.

^dBy definition, all blended households contained adult males. ^dYouth dependency ratio is defined as (# individuals 0–17 years old) / (# individuals 18+ years old).

Table 4

Summary of Logistic Regression Analysis for Educational Enrollment as a Function of Relationship to the Household's Adult Males (Model 1), Controlling for Background Variables ($N=2029$ for "both sexes"; $N=994$ for males; $N=1035$ for females^a).

Predictor	Adult male presence (both sexes)		Adult male presence (male children)		Adult male presence (female children)		Adult male presence and mother presence (both sexes)	
	<i>B</i> (<i>OR</i>)	<i>SE B</i>	<i>B</i> (<i>OR</i>)	<i>SE B</i>	<i>B</i> (<i>OR</i>)	<i>SE B</i>	<i>B</i> (<i>OR</i>)	<i>SE B</i>
Father present (reference category)								
Adult male relative(s)	-0.31 (0.73)	0.17	-0.50* (0.61)	0.23	0.00 (1.00)	0.28	-0.45 (0.64)	0.33
Stepfather	-0.57** (0.57)	0.22	-0.82** (0.44)	0.28	-0.18 (0.84)	0.36	-1.12 (0.33)	0.87
Other non-related adult male(s)	-0.65*** (0.52)	0.17	-0.71** (0.49)	0.24	-0.54* (0.58)	0.23	-0.70* (0.50)	0.32
No adult males	-0.45* (0.64)	0.21	-0.30 (0.74)	0.29	-0.59* (0.55)	0.30	-0.74* (0.48)	0.37
Mother present							-0.15 (0.86)	0.31
*Adult male relative(s)							0.17 (1.19)	0.39
*Stepfather							0.59 (1.81)	0.90
*Other non-related adult male(s)							-0.35 (0.71)	0.45
*No adult males							0.45 (1.58)	0.44
Age (reference category: 14–15 years)								
6–7 years	-0.86*** (0.42)	0.18	-0.70** (0.50)	0.25	-1.06*** (0.35)	0.28	-0.86*** (0.43)	0.18
8–10 years	-0.10 (0.90)	0.18	-0.01 (0.99)	0.24	-0.20 (0.82)	0.28	-0.10 (0.90)	0.18
11–13 years	0.14 (1.14)	0.18	0.11 (1.12)	0.24	0.16 (1.18)	0.29	0.13 (1.14)	0.18
Male (reference category: female)	-0.60*** (0.55)	0.12					-0.59*** (0.55)	0.12
Members	-0.02 (0.98)	0.02	0.01 (1.01)	0.03	-0.06 (0.94)	0.04	-0.01 (0.99)	0.02

Predictor	Adult male presence (both sexes)		Adult male presence (male children)		Adult male presence (female children)		Adult male presence and mother presence (both sexes)	
	<i>B</i> (<i>OR</i>)	<i>SE B</i>	<i>B</i> (<i>OR</i>)	<i>SE B</i>	<i>B</i> (<i>OR</i>)	<i>SE B</i>	<i>B</i> (<i>OR</i>)	<i>SE B</i>
Youth dependency ratio	-0.14 (0.87)	0.51	-0.83 (0.44)	0.67	0.87 (2.38)	0.78	-0.15 (0.86)	0.52
Household education (years) ^b	0.19*** (1.21)	0.03	0.15*** (1.17)	0.03	0.27*** (1.31)	0.05	0.19*** (1.21)	0.03
Household education missing	0.20 (1.22)	0.16	0.14 (1.15)	0.22	0.32 (1.37)	0.24	0.19 (1.21)	0.16
Asset wealth ^c	0.30*** (1.35)	0.08	0.35*** (1.42)	0.10	0.22 (1.25)	0.13	0.30*** (1.35)	0.08
Year 2012 (reference category: Year 2009)	-0.29* (0.75)	0.12	-0.31 (0.74)	0.16	-0.27 (0.76)	0.19	-0.30* (0.74)	0.12
Constant	1.80		1.51		1.35		1.93	
χ^2	157.52		69.93		76.35		160.51	
<i>df</i>	14		13		13		19	
Educational enrollment (%)	78.7		74.9		82.3		78.7	

Note: Standard errors clustered at the individual level. Analysis limited to children aged 6–15 years with known enrollment status. OR = Odds Ratio. Educational enrollment coded as 1 for *enrolled* and 0 for *not enrolled*.

^a Ten individuals who had ambiguous relationships to all adult males in the household were excluded from analysis.

^b Education reflects years of attainment by household head or parent who lived in the household (whichever was highest).

^c Asset wealth reflects thousands of 2012 USD.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 5

Summary of Logistic Regression Analysis for Impact of Household Type on School Enrollment of Father-Present and Father-Absent Children (Model 2), Controlling for Background Variables ($N = 2029$).

Predictor	<i>B</i>	<i>SE B</i>	<i>OR</i>
Household not blended, father present (reference category)			
Household not blended			
Adult male relative(s)	−0.36	0.20	0.70
Stepfather	−0.71 **	0.25	0.49
Other non-related adult male(s)	−0.61 **	0.19	0.54
No adult males	−0.44 *	0.22	0.64
Household blended			
Father	0.03	0.23	1.03
Adult male relative(s)	−0.02	0.33	0.98
Stepfather	−0.05	0.43	0.95
Other non-related adult male(s)	−0.78 **	0.29	0.46
No adult males ^a	0		
Age (reference category: 14–15 years)			
6–7 years	−0.84 ***	0.18	0.43
8–10 years	−0.10	0.18	0.91
11–13 years	0.13	0.18	1.14
Male (reference category: female)	−0.60 ***	0.12	0.55
Members	−0.02	0.02	0.98
Youth dependency ratio	−0.18	0.52	0.84
Household education (years) ^b	0.19 ***	0.03	1.21
Household education missing	0.19	0.16	1.20
Asset wealth ^c	0.29 ***	0.08	1.34
Year 2012 (reference category: 2009)	−0.29 *	0.12	0.75
Constant	1.83		
χ^2		163.79	
<i>df</i>		18	
Educational enrollment (%)		78.7	

Note: “Blended” signifies 1 father present and 1 father absent (Figure 2). Standard errors clustered at the individual level. Analysis limited to children aged 6–15 years with known enrollment status. OR = Odds Ratio. Educational enrollment coded as 1 for *enrolled* and 0 for *not enrolled*.

^a By definition, all blended households contained adult males.

^b Education reflects years of attainment by household head or parent who lived in the household (whichever was highest).

^c Asset wealth reflects thousands of 2012 USD.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 6

Summary of Household Fixed Effects Analysis for Educational Enrollment as a Function of Relationship to Adult Males in the Household (Model 3), ($N = 2029^a$ individuals in 987 household-year groups).

Predictor	Adult male presence	
	<i>B</i>	<i>SE B</i>
Father present (reference category)		
Adult male relative(s)	−0.05	0.04
Stepfather	0.03	0.05
Other non-related adult male(s)	−0.19***	0.04
No adult males ^b	0	
Age (reference category: 14–15 years)		
6–7 years	−0.11***	0.03
8–10 years	0.01	0.03
11–13 years	0.05	0.03
Male (reference category: female)	−0.08***	0.02
Constant	0.88	
R^2	0.028	
F	10.23***	

Note: Fixed effects were performed within the household*year level. Analysis limited to children aged 6–15 years with known enrollment status. Educational enrollment coded as 1 for *enrolled* and 0 for *not enrolled*.

^aTen individuals who had ambiguous relationships to adult males were excluded from analysis.

^b“No adult males” was invariant with in the household.

*
p < .05.

**
p < .01.

p < .001.