Ghana | September 2025

Mother and Father Time Use of Preschool-Aged Children in Rural Ghana

Working paper

Jophus Anamoah-Mensah, Britta Augsburg, Marc H. Bornstein, Sonya Krutikova, Noelle M. Suntheimer, Ottavia Anna Veroux, and Sharon Wolf

Abstract

Parental time allocation sheds light on caregiving investments, gendered household patterns, and socioeconomic inequalities that have implications for early childhood development. Evidence on this allocation from low- and middle-income countries is scarce and predominantly mother-centric. Drawing on weekday time use diaries for 663 mother–father dyads with preschool-aged children in rural Ghana, we analyse how individual and joint education shape parents' daily activities. Findings show gender and educational divides within and across households. Fathers allocate more time to paid or farm work, whereas mothers devote more time to unpaid care. Compared to couples with no formal schooling, when both parents have some formal education (pre-primary or more), mothers spend more time engaging in learning activities with young children, and both parents spend more time providing care for children and elders in the household, and instead spend less time sleeping. Parental time use is correlated with fathers' education, as in couples where only the mother has some formal education, there are no statistically significant differences in her time relative to mothers in couples where neither partner is educated. Our results highlight the decisive role of paternal education and educational pairing in shaping parental time allocation: this is a nuance that is overlooked by early childhood development interventions that focus almost exclusively on mothers.

Keywords: Ghana, rural, time use, mothers and fathers, education, educational pairing

thrive

Authors — in alphabetical order, not by contribution

- Jophus Anamoah-Mensah, Thrive, UK
- Britta Augsburg, Institute for Fiscal Studies, UK
- Marc H. Bornstein, Institute for Fiscal Studies, Eunice Kennedy Shriver National Institute of Child Health and Human Development, and United Nations Children's Fund (UNICEF), USA
- Sonya Krutikova, Institute for Fiscal Studies and University of Manchester, UK
- Noelle M. Suntheimer, Institute for Child Development, University of Minnesota, USA
- Ottavia Anna Veroux, Institute for Fiscal Studies
- Sharon Wolf, Graduate School of Education, University of Pennsylvania, USA

Acknowledgements

This study was funded by the Foreign, Commonwealth, and Development Office (FCDO), UK, under contract reference PO10087. We also gratefully acknowledge funding from the United States Agency for International Development (USAID) (grant 7200AA21FA00016), the UK Medical Research Council (grant MR/V035312/1), and the Economic and Social Research Council's Centre for the Microeconomic Analysis of Public Policy at the Institute for Fiscal Studies (ES/T014334/1). This research was also supported by the Intramural Research Program of the National Institute of Child Health and Human Development of the National Institutes of Health (Z99 HD999999), which was awarded to this paper's third author. The research reported in this publication was also supported by the National Institute of Mental Health of the National Institutes of Health under Award Number T32 MH015755 awarded to the fourth author. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health. The order of the authors is alphabetical, not by contribution. The data used in this study were collected as part of a randomised controlled trial for which study protocols have been approved by ethics boards at University College London (IRB 21361/001), Yale University (IRB 2000031549), and the Ghanaian Health Service Ethics Review Committee (IRB 028/09/21). The trial registration number is AEARCTR-0008500, ISRCTN15360698.

Recommended citation

Anamoah-Mensah, J., Augsburg, B., Bornstein, M.H., Krutikova, S., Suntheimer, N.M., Veroux, O.A. and Wolf, S. (2025) 'How do mothers and fathers of preschool children in rural spend their time?' *Thrive working paper*, Oxford Policy Management.
https://thrivechildevidence.org/resource-centre/**mother-and-father-time-use-of-preschool-aged-children-in-rural-ghana/**

Disclaimer

The Thrive programme is funded by UK International Development from the UK government and by New Zealand's Ministry of Foreign Affairs and Trade. It is managed by Oxford Policy Management in collaboration with the Institute for Fiscal Studies.

Oxford Policy Management
Ground floor, 40–41 Park End Street, Oxford, OX1 1JD   T: +44 (0)1865 207 300
Registered in England 3122495
thrivechildevidence.org | @Thriveevidence

Contents

Introduction

Parents' time investment in their children is a key pathway for promoting children's development and economic outcomes, and is a channel of intergenerational transmission of human capital (Bornstein, 2014; Conger and Donnellan, 2007; Cunha *et al*., 2010; Del Boca *et al*., 2014; Hsin and Felfe, 2014). Many early childhood development (ECD) programmes seek to increase both the quantity and quality of time that primary caregivers, often mothers, spend with their young children. Because better-educated parents are consistently found to spend more time with their children (Guryan *et al*., 2008; Kalil *et al*., 2012), programmes focus on supporting families with lower levels of education to create more early learning opportunities. This strategy assumes that parents can increase the amount of time spent with their young children, overlooking that many parents already face significant time constraints. Evidence from low- and middle-income countries (LMICs) suggests that these programme expectations may expand the unpaid care (e.g. household and caregiving tasks) burden, which disproportionately falls on mothers. A review of 263 ECD policies found that only 40 acknowledged the link between greater parental engagement and increased unpaid care (Chopra, 2014). Moreover, interventions overwhelmingly focus on mothers with less schooling, and postulate that they will benefit more, based on the premise that they have the greatest scope to change their behaviour (Jeong *et al*., 2021). In practice, this means that women who already bear the bulk of unpaid care are asked to do even more, while fathers' contributions remain largely unexamined.

Absent an understanding of how households allocate time – who performs which care tasks, how these patterns vary by parental education, and how educational assortative mating shapes these allocations – ECD initiatives risk producing unintended burdens. To design fair and effective programmes, we must first describe how both mothers and fathers distribute their time, and how maternal and paternal education, and their pairing, shape these decisions.

This study provides new evidence on how parents balance caregiving, paid work, and other daily activities across regions of Ghana that face some of the highest rates of poverty and lowest access to formal education across the nation (Ghana Ministry of Education and UNICEF, 2020; Ghana Statistical Service, 2015). Using weekday time use diaries from 663 mother–father dyads who are parents of a preschool-aged child, this study has two main aims: (1) to describe and visualise how parents allocate their time in a low-resource and rural context; and (2) to examine how patterns of time use vary by mothers' and fathers' formal education and by couples' educational pairing. Given well-documented disparities in unpaid care between mothers and fathers (and women and men more generally), we first examine unpaid care as an aggregate category, and subsequently disaggregate it into four specific activities to better understand educational pairing patterns in time use.

Our findings reveal both gendered divisions of labour and important variation based on whether parents have any formal education. Fathers spend more time than mothers on paid and farm-based labour, as well as on personal care and leisure, while mothers spend more time on unpaid care, with particularly large differences for household tasks and caring for others.

Variation in mothers' and fathers' time use appears to be more strongly associated with fathers' education than with mothers'. Couples in which neither partner attended formal schooling allocate their time, on average, in much the same way as couples where only the mother had some formal education. Differences in time allocation emerge only when the father has some formal education, though they are even more pronounced when both parents are educated. Overall, fathers with some formal education spend more time on paid labour and less time on farm or family-enterprise work compared to fathers in couples where neither partner has formal education. In these couples, both mothers and fathers sleep less and devote more time to unpaid care than couples without formal education. When we disaggregate unpaid care, we find that the larger amount of time spent on unpaid care for both mothers and fathers comes from more time spent caring for other household members. However, in couples where both partners have some formal schooling, mothers spend additional time on child play and learning – an increase that is not observed when only the mother or only the father is educated.

Together, the findings highlight the importance of considering not just individual characteristics, but the pairing of partners, in understanding how social and economic factors shape family life.

Previous research

Parents' gender and educational attainment shape their time allocation across daily activities. In LMICs, where access to paid work, child and eldercare support, and social services are limited, time allocation decisions often reflect complex trade-offs between economic necessity and caregiving demands. This section reviews previous research on three key activities: (1) paid and farm-based/own enterprise-based work, and unpaid care; (2) ECD investments; and (3) personal care and leisure. These domains provide the conceptual grounding for our study, which investigates time use among parents of preschoolers in rural Ghana.

Paid and farm-based/own enterprise-based work and unpaid care

In many low-income and agrarian settings, men are more likely than women to engage in formal or wage-based employment, while women are disproportionately involved in unpaid agricultural labour, informal household enterprises, and unpaid care work (Doss, 2013; Charmes, 2006; ILO, 2018; UN Women, 2022). Unpaid care refers to tasks that are essential for household and community functioning that are often done without pay, including cooking, cleaning, and caring for children, sick family members, or elders (UN Women, 2022). Women are estimated to perform, on average, three times more unpaid care work than men (ILO, 2018; UN Women, 2022). In LMICs and the US, even when women participate in income-generating work, they often retain primary responsibility for domestic tasks, ultimately spending more waking hours working overall (Ford *et al*., 2025). These dynamics reflect both structural barriers to women's labour market participation and gendered norms relating to household roles.

Education tends to shift the composition of household economic activities: more educated individuals, particularly men, are more likely to access off-farm, higher-wage employment (World Bank, 2012). For women, even modest education can be associated with engaging in paid labour, yet this does not always reduce household tasks or caregiving responsibilities (Anderson and Eswaran, 2009; Ford *et al*., 2025). The extent to which education shifts patterns of paid and unpaid care work, and how it does so, can vary across geographic contexts, reflecting cultural norms, labour markets, and policy environments (Charmes, 2006; ILO, 2018).

ECD investments

Parental time investments in ECD – including basic care, play, emotional support, and school-based involvement – are greater among mothers than fathers, even though this gap has narrowed slightly over time (Evans and Jakiela, 2024; Guryan *et al*., 2008). Studies conducted in high-income contexts suggest that when one parent increases their involvement, the other tends to do the same (Tamis-LeMonda *et al*., 2004). However, drivers of father ECD time investment and joint ECD time investment remain less understood, especially in LMICs where norms relating to fatherhood are evolving (e.g. Jeong *et al*., 2024). For example, in northern Ghana, fathers are increasingly engaged in specific caregiving tasks, such as feeding and playing, although they remain less involved in household chores – in part due to enduring cultural norms (Saaka *et al*., 2023).

Across geographic contexts, parental education also shapes involvement in child-centred activities, with more educated mothers spending more time on cognitively stimulating activities in the US than less educated mothers (Kalil *et al*., 2023). Likewise, in Ghana, higher-educated fathers reported greater involvement in childrearing than less educated fathers (Saaka *et al*., 2023).

Personal care and leisure

Gender gaps in personal care in leisure time often emerge during adolescence (Vikram *et al*., 2024). One consequence of women undertaking a disproportionate amount of unpaid care, including when they work for pay, is that they have little to no time left in their days for activities that promote good health and well-being, such as hygiene, rest, socialisation, and religious practice (Hyde *et al*., 2020; Vikram *et al*., 2024). On average, women have less – and lower-quality – leisure time than men and are more likely to sacrifice it when caregiving and paid labour demands increase (Andrew *et al*., 2020; Kimmel and Connelly, 2007). Additionally, even when fathers are engaged in childrearing, they are more likely to take on the recreational aspects of caregiving, such as play, while mothers are more likely to perform routine tasks, such as bathing (Guryan *et al*., 2008).

The rural Ghanaian context

Ghana is a culturally diverse lower middle-income country in West Africa, with stark regional disparities in living standards (Ghana Statistical Service, 2022). Relative to the peri-urban Greater Accra region – home to the nation's capital – families in the rural northern regions experience higher rates of poverty (ranging from approximately 45% to 71%) and have the lowest rates of primary school enrolment (Ghana Ministry of Education and UNICEF, 2020; Ghana Statistical Service, 2015).

As at 2024, approximately 62% and 65% of women and men in Ghana, respectively, were participating in the labour force (World Bank, n.d.). Traditional gendered and historical norms around work and caregiving persist: men are expected to provide materially and financially for the household, while women are expected to take on household chores and care for children (Dow *et al*., 2018). In rural areas, nearly three-quarters of individuals rely on agriculture as their primary occupation (Ghana Statistical Service, 2013). Unpaid care activities, most often carried out by mothers, include caregiving for children and elders, domestic chores, and transmitting local norms that promote community cohesion and well-being (UN Women, 2022; United Nations Development Programme, 2024). In Ghana, women spend approximately twice as much time on unpaid care as men (245 versus 106 minutes per day, respectively) (Saha *et al*., 2023).

The present study

This study provides novel evidence from rural northern Ghana on how mothers and fathers of preschool-aged children allocate their time across a typical weekday, and how this allocation varies by educational pairing. We first describe differences in how parents allocate time across five daily activities: paid labour; farm or family enterprise; unpaid care; personal care and leisure; and sleep. To assess how gendered divisions manifest within unpaid care, we subsequently disaggregate this category into four specific tasks: child play and learning; schooling activities; household tasks; and caregiving for others (Aim 1). We then examine how patterns of time use vary by mothers' and fathers' education and by couples' educational pairing – whether neither, one, or both partners have some formal education (Aim 2). This allows us to assess whether educational gradients are associated with time allocations in this context, and whether educational similarity or disparity between mother and father shapes how households structure their time across key activities. We extend prior work – largely focused on mothers in high-income contexts – by shedding light on paternal time use across and within couples in a West African setting. Our findings have programme and policy implications: interventions must account for intrahousehold time allocation and consider fathers' education alongside mothers'.

Methods

Participants and procedures

Our sample is representative of couples[1] with a child attending a government pre-primary mixed-gender school in 54 of 61 districts across eight regions of northern Ghana. The data were collected as part of a randomised controlled trial (RCT) of an ECD programme (see Augsburg *et al*., 2022 for experimental details). In each district, five schools were randomly selected from lists managed by the Ghana Education Management Information System (EMIS), and in each school, eight kindergarten children were randomly selected from attendance lists.[2]

Data used in this study come from surveys administered to mothers (M_{age} = 34.4; 46.6% with some formal education) and fathers (M_{age} = 41.7; 51.4% with some formal education) of children participating in the RCT. To avoid potential confounding from intervention exposure, we restrict our sample to the control group. Our analysis focuses on couples in which the mother and father are the child's biological parents at intervention baseline. In 10% of cases (n = 67), the primary caregiver changed from being the biological mother at endline. Because it is unclear whether this change reflects a change in the couple, we retain these cases but include a dummy variable to account for them.[3] Our analytic sample comprises 663 mother–father dyads. [4] If excluded households differ systematically from those included in the analytic sample on sociodemographic characteristics or time use data, this may introduce bias.

Descriptive statistics for the analytic sample are presented in Table 1. Mothers in the sample were, on average, 34.4 years old, and just over half (53.4%) never attended formal education. They lived in households averaging six members, with the youngest child typically aged three, and 21% of households included at least

[1] All couples in the sample are male–female couples, with one biological mother and one biological father.
[2] In 12 districts, 10 schools were chosen.
[3] This change happened between the first round of data collection of the evaluation study and the second round, which we use in this analysis, as it is the time both the mother and the father were interviewed. In Appendix D we provide our findings with the reduced sample. The results are similar.
[4] Data on 203 households could not be included in the analysis as only data on the mother was available, father data was missing or ineligible. We compare dropped and retained households in Appendix Table A.1. We primarily see differences across region, ethnicity, and mother's age. In particular, respondents from the sample are somewhat less likely to be from the Savanna region and more likely to be from the Upper West region (where the main ethnicity is Grusi), compared to Ghana's population as a whole; hence, we also see the included sample's household heads are more likely to be from that ethnicity than would be the case for Ghana's population as a whole. The included mother sample is also on average two years younger than the average for Ghanaian mothers generally. They do not differ with respect to their education, household composition, or asset ownership.

one elderly member (defined as 60 years or older). Fathers were, on average, seven years older than their spouses and slightly more likely to have attended any schooling, although 48% of fathers also reported having no formal education. Educational assortative mating was common, with two-thirds of couples sharing the same education level: in 33.6% of couples, neither partner was educated and in 31.7% both partners had some formal education. In 14.9% of couples, only the mother had some formal education, while in 19.8%, only the father did.

At the bottom of Table 1, we report parental attitudes toward household dynamics. Regarding whether the reporting parent deserves to be beaten by his/her spouse if he/she neglects the children, 33.5% of mothers and 15.7% of fathers agreed. In terms of household roles, 93% of mothers reported that food preparation and house cleaning are usually the mother's responsibility, and 70% reported the same for childcare. Fathers also largely endorsed maternal responsibility for food preparation (89%) and house cleaning (77%), but were far less likely to view childcare as primarily the mother's role (42%).

Measures

All questions in the survey were administered in person to mothers and fathers separately using an interview format conducted by trained Ghanaian interviewers. Interviews were conducted in participants' preferred language. During interviewer training, survey instruments were translated from English into the 14 major languages spoken in study districts and back-translated into English to ensure accuracy and to uphold study quality standards. Measures were selected for cultural and linguistic appropriateness.

Mothers' and fathers' time use

Parental time use was measured via a measure that is commonly used in other large-scale studies in LMICs (Espinoza-Revollo and Porter, 2018). Mothers and fathers were asked to report on the activities they carried out on a typical weekday. Participants were provided with 24 counters, each representing an hour of the typical weekday, and asked to allocate these pebbles across pre-defined activities, ensuring that all 24 hours were accounted for. A 'typical weekday' was defined for respondents as Monday to Friday, excluding holidays, festivals, or other special occasions. Appendix B provides the exact phrasing of the question and the instructions provided to surveyors.

In the following analysis, we start by presenting respondents' time allocation across five domains: (1) *paid labour outside the household*; (2) *farm and family enterprise*, including time spent on tasks on the family farm and other family business endeavours; (3) *unpaid care*, which comprises four activities, including caring for others in the household, schooling activities with children, playing with young children, and household chores; (4) *sleep*; and (5) *personal care and leisure*, reflecting caring for one's self and attending to hygiene, socialising, and religious activities. We next disaggregate unpaid care into its four sub-categories: (1) *caring for others in the household,* including the elderly and small children but excluding cognitive stimulation; (2) *schooling activities* for young children; (3)

child play and learning with young children in the household; and (4) *household tasks*, including cleaning, cooking, and shopping.

Mothers' and fathers' education

Mothers and fathers reported the highest grade they completed. From this information, we constructed an indicator to determine whether formal education was received (including attending preschool) or not (0 = no formal education; 1 = some formal education). Attending some formal education in this sample indicates that mothers/fathers attended preschool or primary (20% mothers; 19% fathers), junior high (20% mothers; 16% fathers), senior high (3% mothers; 10% fathers), or post-secondary education, such as vocational/technical training, diploma, or university (1% mothers; 7% fathers). Appendix Table A.2 provides these details. For a robustness check, we constructed an alternative education variable, where '0' indicates a respondent had primary education or less and '1' indicates they had more than primary education.

Covariates

We included a set of sociodemographic characteristics in our multivariate regression models for Aim 2, selected based on prior research that has linked these characteristics to parental time use (e.g. Guryan *et al.*, 2008). Mothers reported their age (in years), the number of children in the household, the age of the youngest child in the household (as calculated from the household roster), whether the household had any elderly members (defined as being 60 years or older), the region in which they reside, as well as the household's main ethnicity. We also included a wealth index, which is a latent factor score based on mothers' responses regarding 11 housing qualities, and the presence of certain household items (KR_{20} = 0.65). Fathers reported their age and education.

Analytic plan

To address our first aim, we used descriptive statistics (e.g. means, standard deviations, and ranges) and visualised distributions using histograms to describe the time use of mothers and fathers across activities. We also conducted Kolmogorov–Smirnov (K-S) tests of equality to examine differences in the distribution of time use across groups. To address our second aim, we used multiple ordinary least squares (OLS) regression models to estimate the association between couples' formal education and time use, adjusting for key covariates. Separate models were run for mothers, fathers, and intrahousehold differences. The first set of models (15 total) focused on paid and unpaid continuous time use categories as the dependent variables and education as the independent variable of interest. The second set of models (12 total) focused on unpaid care time categories as the dependent variables and education as the independent variable of interest. All analyses were conducted in Stata Version 18.0.

Results

Research aim 1: describing mothers' and fathers' time use

Table 2 presents the means (M) and standard deviations (SD) of time use (in hours) across eight activities, separately for mothers (columns (1) and (2)) and fathers (columns (3) and (4)). Two-sample *t*-tests in columns (5) to (7) indicate statistically significant differences ($p \leq .01$) between mothers and fathers across all categories. Fathers report spending significantly more time than mothers on paid labour (M = 2.39 hours, SD = 2.85 vs. M = 0.97 hours, SD = 1.84), $t(662) = -11.95$, $p < .001$, as well as on farm and family enterprise work (M = 5.93 hours, SD = 2.29 vs. M = 4.99 hours, SD = 2.01), $t(662) = -8.65$, $p < .001$. Fathers also report spending significantly more time on personal care and leisure activities (M = 3.70 hours, SD = 1.86) compared to mothers (M = 2.52 hours, SD = 1.21), $t(662) = -14.20$, $p < .001$. Conversely, mothers report spending slightly more time asleep than fathers (M = 8.18 hours, SD = 1.22 vs. M = 8.01 hours, SD = 1.13), $t(662) = 2.90$, $p = .004$, although the difference – about 10 minutes – is small, representing only 2% of the average daily sleep time for mothers

In contrast, mothers report spending substantially more time on unpaid care work, with higher averages in three of the four relevant categories. The largest difference is observed in household tasks: mothers report 3.53 hours per day (SD = 1.25), compared to 1.12 hours for fathers (SD = 1.20), $t(662) = 35.01$, $p < .001$. Time spent caring for other household members also shows a notable gender gap, with mothers reporting nearly one hour more per day (M = 2.08 hours, SD = 1.22) than fathers (M = 1.20 hours, SD = 1.09), $t(662) = 14.05$, $p < .001$. Similarly, mothers report spending more time than fathers on schooling activities (M = 0.65 hours, SD = 0.91 vs. M = 0.46 hours, SD = 0.69), $t(662) = 4.65$, $p < .001$. Fathers, however, report spending slightly more time than mothers on child play and learning (M = 1.19 hours, SD = 1.02 vs. M = 1.07 hours, SD = 0.97), though the absolute difference of seven minutes is small, $t(662) = -2.20$, $p = .028$.[5]

The final column of Table 2 reports results from two-sample Kolmogorov–Smirnov (K–S) tests, which assess whether the distributions of reported time use

[5] Appendix Table C2 shows differences in time use of mothers and fathers by education, showing that education is associated with more time being spent on paid labour for both mothers and fathers. Educated fathers spend less time on farm and own enterprise activities than fathers with no education, whereas educated mothers spend less time caring for others in the household and on household tasks than mothers with no education. Contrary to what is seen in many other contexts, mothers with some formal education do not report spending more time on schooling activities or child play than mothers without formal education, whereas fathers with no formal education report spending slightly more time than their educated counterparts on both schooling activities and child play.

differ significantly by gender. With the exception of time spent on child play and learning, all activity categories exhibit statistically significant distributional differences. These are visualised in Figure 1, which plots the full distributions of time use for each activity separately by the parent's gender. Distributional differences are especially pronounced for household tasks and caring for other household members. In both cases, the distribution for fathers is notably right-skewed, with a larger proportion reporting little or no time spent on these activities, while the corresponding distributions for mothers are more symmetric or left-skewed, indicating more consistent engagement.

Gender differences in time use are also evident *within* couples (see Figure 2 for within-household differences, calculated as mother's hours minus father's hours).[6] The largest within-household gap appears for household tasks, indicating that in most households mothers spend more time on household tasks than fathers. A similar pattern is observed for caregiving for other household members, and to a lesser extent for schooling activities. In contrast, the distribution of differences in farm and family enterprise hours is negatively skewed, reflecting fathers' greater involvement in agricultural and family business work. A similar, though less pronounced, pattern is observed for personal care and leisure. Differences in time spent on paid labour, sleep, and child play and learning are more symmetrically distributed around zero, suggesting either greater parity in these domains or greater variation across households in how these activities are shared.

Research aim 2: Differences in time use by formal education and educational pairing

We next examine how time use varies by parents' educational pairing, using couples in which neither partner has formal education as the reference group. Results from multiple linear regression models are presented in Table 3 (overall time categories) and Table 4 (unpaid care sub-categories). Appendix Tables C.3a–C.4c provide the full models with covariates. Each table reports results separately for mothers (Panel A), fathers (Panel B), and within-couple differences in time use (Panel C), calculated as maternal hours minus paternal hours.

Mothers' time use (Tables 3+4, Panel A): In couples where only the mother has formal education (15% of couples), there are no statistically significant differences in her time allocation across any activity category in Tables 3 and 4, relative to mothers in couples where neither partner is educated.

However, when the father has some formal education (with the mother uneducated; 20% of couples), mothers spend significantly more time on unpaid

[6] In addition to the within-household differences discussed in the main text, Appendix Table B.1 presents the correlation coefficients between mothers' and fathers' time use. This table illustrates how time allocations co-move within couples, while the main text focuses on the magnitude of within-couple gaps in time allocation. The correlations reveal an interesting pattern: time allocated to the same activity category tends to be positively correlated, with the exception of household tasks – though this correlation is not statistically significant.

care (+0.62 hours, SE = 0.22, $p < .001$) and less time on sleep (–0.24 hours, SE = 0.14, $p < .10$). These differences are also observed when both partners have formal education. In such couples, mothers report spending significantly more time on unpaid care (+0.45 hours, SE = 0.23, $p < .10$) and less on sleep (–0.36 hours, SE = 0.15, $p < .05$) compared to couples where neither partner has any schooling. Mothers' time spent on paid or farm-based work does not significantly differ by educational pairing.

Disaggregating unpaid care in Table 4 (Panel A) shows that the largest differences stem from time spent caring for other household members, with mothers reporting more time spent caring for others in these pairings when they themselves lack education (+0.34 hours, SE = 0.12, $p < .01$). In addition, in couples where both parents are educated, mothers spend an additional 0.24 hours per weekday on child play and learning activities (SE = 0.12, $p < .05$).

Fathers' time use (Tables 3+4, Panel B): Fathers' time use shows more substantial differences by education status, as displayed in Table 3. When only the father has some formal education, fathers spend significantly more time on unpaid care (0.50 hours, SE = 0.29, $p < .10$) and less time sleeping (–0.26 hours, SE = 0.12, $p < .05$), similar to the pattern observed for mothers' time use. In couples where both parents have some formal education, fathers spend more time on paid labour (+0.84 hours, SE = 0.32, $p < .01$) and less on farm and family enterprise activities (-0.84 hours, SE = 0.25, $p < .001$), compared to fathers in couples with no education. Fathers also spend significantly more time on unpaid care (+0.71 hours, SE = 0.31, $p < .05$), which is drawn from both sleep (–0.32 hours, SE = 0.13, $p < .05$) and personal care/leisure time (–0.38 hours, SE = 0.20, $p < .10$).

As shown in Panel B of Table 4, the largest differences for unpaid care stem from caring for others in the household, mirroring the same pattern for mothers' time use. When the father has some formal education, he reports significantly more time in this domain (+0.32 hours, SE = 0.12, $p < .01$), increasing to +0.40 hours (SE = 0.12, $p < .01$) when both spouses are educated.

Within-couple time differences (Tables 3+4, Panel C): Within-couple comparisons reinforce the gendered patterns and differences described above. As shown in Panel C of Table 3, in couples where only the father is educated, the gender gap in paid labour (mother–father) is significantly wider (–0.64 hours; SE = 0.33, $p < .10$) than in couples with no education. In couples where both parents are educated, the mother–father time use gap for paid labour widens to –0.80 hours (SE = 0.35, $p < .05$), reflecting a higher likelihood of the father participating in wage labour, which is not the case for mothers. However, the gender gap in personal care and leisure narrows, reducing from fathers spending on average 101 minutes more than mothers on this activity, to them spending 75 minutes more than mothers.

There are no statistically significant differences in within-couple gaps across all four unpaid care categories (Table 4, panel C). This aligns with the previous finding that in couples where only the father is educated, *both* mothers and fathers spend more time on unpaid care than in couples with no formal education.

Robustness checks. Appendix Tables D.1-D.2 and E.1-E.2 report robustness checks for Research Aim 2. First, we assess whether excluding the 10% of cases (*n* = 67) in which the endline primary caregiver changed and was not the intervention target child's biological mother. Overall, results from the more restricted sample are substantively similar to results from our main models (Tables 3 and 4). Next, Appendix Tables E.1 and E.2 present results using an alternative education classification to assess sensitivity to the schooling cut-off point, where '0' refers to having no formal schooling or primary education and '1' indicates more than primary school education. Here, results for mothers' time use remain consistent with the main education specification (and sometimes become even larger in magnitude), while a slightly different pattern emerges for fathers. Regression estimates for fathers' time use are attenuated. This suggests that having attended any primary schooling matters for fathers in this context, whereas for mothers, completing more than primary schooling makes a bigger difference than having any schooling of any kind.

Discussion

Our findings provide valuable insights into time use patterns for mothers and fathers of preschool-aged children, and how educational attainment and pairing shape parental time use in rural northern Ghana, with implications for young children's experiences at home. In our first research aim, we document a gendered division of paid labour and unpaid care between mothers and fathers of preschool-aged children. Fathers' greater involvement in paid and farm-based work aligns with their generally stronger access to income-generating opportunities. That involvement grow when couples have children (Kleven *et al*., 2024). Meanwhile, mothers' disproportionate responsibility for household tasks, and unpaid domestic labour more generally, aligns with well-documented gender disparities in both Ghana and globally (ILO, 2018; Saha *et al*., 2023). Despite significant participation in subsistence and informal work, mothers continue to shoulder most household duties: in order to engage in this work, they seemingly reduce their sleep time, rather than their time on domestic tasks. This is in line with existing research from LMICs and the US that demonstrates that when mothers, and women more generally, participate in the labour market, it increases their overall working hours and compromises sleep and leisure (Ford *et al*., 2025; Kimmel and Connelly, 2007). These findings can inform the design and implementation of parent-based interventions, so they better respond to the complex realities of families with young children.

Our findings relating to Aim 2 of our study further illuminate how educational pairing within couples shapes time allocation, and by extension the capacity of parents to engage in their children's development. In couples where only the father has some formal education, fathers report increased involvement in caregiving for other household members. This suggests that educational gains may modestly expand fathers' role in the domestic sphere, but not their engagement with children. Time spent on child play and learning activities increases only for mothers when both parents have some formal education, compared to couples where neither has some formal education, indicating maternal engagement may depend on shared educational background within the couple, and that other factors may be stronger drivers of fathers' engagement in children's learning in this context. Interestingly, one cross-national study (across 38 LMICs) found that fathers with higher education levels engaged in more cognitively stimulating activities with their three- and four-year-old children (Jeong *et al*., 2016). It is possible that fathers' education is associated with specific caregiving *behaviours*, but it may not necessarily shape the quantity of time spent with children.

Together, the findings suggest that assortative mating on education – where both parents have some formal schooling – is associated with differences in household time allocation, including dual engagement in caregiving. However, in couples where both partners are educated, mothers continue to carry a disproportionate share of the unpaid care burden, despite significant engagement in work activities. Interventions aimed at increasing parental engagement in child development, especially in rural LMIC settings, should consider existing time burdens and intrahousehold dynamics. For example, parenting programmes could embed programme content into existing routines (e.g. counting activities while cleaning) and co-design intervention implementation strategies with parents to make the programme realistic and feasible. Additionally, if parenting and family support programmes only target mothers, they may not achieve the desired benefit for children, considering the stronger role fathers' education plays in shaping how parents allocate time. Father-inclusive programming or couple-based strategies may offer a more effective and equitable path forward.

When we use a different way of grouping education levels – comparing ‘at most primary education’ with ‘more than primary education’, instead of ‘no education’ versus ‘some education’ – the results shift slightly. When mothers have more than primary education, the findings remain broadly consistent and even become a bit stronger. For fathers, however, the effects largely disappear, suggesting that for fathers, simply having any education matters, while for mothers, completing more than primary schooling makes the bigger difference.

Strengths and limitations

This study contributes to interdisciplinary research on children and families in several ways. First, we draw on a large sample of rural and economically disadvantaged mothers and fathers in Ghana, which – culturally and geographically – diversifies the time use and parenting literatures. Second, primary data were collected from both mothers and fathers, separately, which allows for a more detailed understanding of intrahousehold time use patterns. Third, our sample exclusively consists of parents of preschool-aged children. We thereby uniquely capture the time use of parents during an important developmental period for children’s early learning and development, when caregiving demands are notoriously high.

There are, at the same time, limitations that should be taken into account when interpreting the study’s findings. First, the cross-sectional and non-experimental nature of the data limits causal inference. This paper is therefore descriptive in nature, aimed at documenting patterns rather than testing hypotheses. While we control for a range of observable characteristics to enable cleaner comparisons across types of couples, our regression analyses are intended to summarise associations rather than establish causal effects. We estimate multiple OLS models to explore how parental time use varies by education level. Because these models are descriptive and not designed for formal hypothesis testing, we do not adjust for family-wise error, and we interpret results based on the patterns of effect sizes and directions, rather than based on statistical significance thresholds. Second, time use data were self-reported and recorded in full-hour increments, without accounting for multitasking or simultaneous activities. This likely introduces rounding and underreporting, particularly for tasks of short duration (Sonnenberg *et al*., 2011). In particular, caretaking, activities with children, and possibly leisure activities, are often performed alongside other tasks, such as caring for children while doing household chores. As a result, our estimates are likely to underestimate the true amount of unpaid care work respondents engage in. Nonetheless, this simplified time use approach is consistent with established practices in low-resource settings, where simplified instruments are necessary for feasibility and comparability (e.g. Charmes, 2006; Kes and Swaminathan, 2006). Third, the data capture only a single point in time and therefore do not reflect potential seasonal variation in time use. Many households in the study area engage in agriculture, suggesting that time allocated to farming and family labour likely fluctuates across the agricultural calendar. Likewise, data collection occurred during the school term, and time use patterns – particularly for parents –may differ during school holidays when children are at home. Fourth, while the study sample is representative of couples with children enrolled in government kindergarten programmes in northern Ghana, the generalisability of the findings to other regions or populations within Ghana, or to other low-income countries, remains uncertain. Indeed, regression coefficients for regions show important differences across northern Ghana (Appendix Tables C.3 and C.4). At the same time, northern Ghana shares several features with other rural areas in sub-Saharan Africa, including high levels of poverty, limited formal employment opportunities, and prevailing gender norms that shape divisions of labour within households. These commonalities suggest that the patterns we document may be relevant to similar settings, though additional studies are needed to assess whether similar patterns are found across other cultural and economic settings.

Conclusions and future directions

This study contributes new evidence on how mothers and fathers in rural northern Ghana allocate their time across paid and unpaid labour, child-centred activities, and personal care, focusing on how these patterns vary between mothers and fathers and by educational pairing. We document a pronounced gendered division of labour, with fathers spending more time on paid and farm-based work, and mothers engaging in a greater share of unpaid domestic and caregiving responsibilities, while also spending a significant part of their waking hours on farm and family-enterprise-based work. In couples where the father has some formal education, he spends more time on paid work and modestly more time on caregiving, while educated mothers with an educated spouse increase the amount of time they spend on play and educational activities with children.

Looking ahead, these findings suggest three important avenues of research that could deepen our understanding of parental time use in contexts like rural Ghana, particularly with the aim of informing ECD interventions. First, to what extent does multitasking exacerbate or reduce the inequalities we document? Second, do the observed inequalities have consequences for parental well-being, which in turn can affect the quality of child–parent interactions (e.g. Ahun and Côté, 2019; McLoyd, 1998)? How does this vary depending on intrahousehold differences in time allocations? Third, to what extent is there variation across the year in parental time use? Exploring how household economic activities, including the nature and seasonality of farm or enterprise work, intersect with time use could clarify how livelihood strategies shape caregiving opportunities and constraints. These efforts would not only advance our empirical understanding of parental time use in low-income settings but also offer practical implications for policy and practice in the design of equitable and context-responsive family and early childhood interventions.

More generally, our results underscore that time use, as well as the interaction of time use and education, can be very context-specific, with high individual variability. Our findings are important for understanding families' use of their time in the rural contexts we studied. Urban settings are likely to face unique challenges, such as those related to longer commuting and working hours, and lower levels of family and community support. Such specificities should be considered in the design of interventions.

Table 1: Sample descriptives

Characteristic	N	M or %	SD
Region			
Bono	92	13.8%	–
Bono East	23	3.5%	–
North East	80	12.1%	–
Northern	117	17.7%	–
Oti	81	12.2%	–
Savanna	44	6.6%	–
Upper East	41	6.2%	–
Upper West	185	27.9%	–
Father education			
No formal	322	48.6%	–
Some formal	341	51.4%	–
Mother education			
No formal	354	53.4%	–
Some formal	309	46.6%	–
Couple's education			
Neither have formal education	223	33.6%	–
Mother only has formal education	99	14.9%	–
Father only has formal education	131	19.8%	–
Both have formal education	210	31.7%	–
Household head ethnicity			
Mole-Dagbani	271	40.9%	–
Gurma	95	14.3%	–
Akan	70	10.6%	–
Grusi	113	17.0%	–
Other	114	17.2%	–
Total household size	663	6.37	2.40
Age of youngest child in household in years	663	3.03	1.77
Household has at least one elderly person	663	20.8%	–
Father age	663	41.67	9.97
Mother age	663	34.40	7.43
Sum of 11 household assets	663	2.87	2.10
Mother-reported household gender dynamics – agreement with statement…			
Husband justified to hit/beat his wife if neglecting children	222	33.5%	–
Mother always or usually prepares food	618	93.2%	–
Mother always or usually cleans house	621	93.7%	–
Mother always or usually cares for children	461	69.5%	–
Father-reported household gender dynamics – agreement with statement…			
Wife justified to hit/beat her husband if neglecting children	104	15.7%	–
Mother always or usually prepares food	589	88.8%	
Mother always or usually cleans house	508	76.6%	
Mother always or usually cares for children	282	41.7%	

Note: N = 663 couples. Elderly is defined as 60 years or older.

Table 2: Mothers' and fathers' time use in hours

	Mothers		Fathers		Two-sample *t*-test			Two-sample K-S test	
	M	*SD*	*M*	*SD*	Diff.	*t*(662)	*p*	*D*	*p*
Paid labour	0.97	1.84	2.39	2.85	-1.41	-11.95	< .001	0.23	< .001
Farm and family enterprise	4.99	2.01	5.93	2.29	-0.94	-8.65	< .001	0.27	< .001
Unpaid care									
Household tasks	3.53	1.25	1.12	1.20	1.77	35.01	< .001	0.65	< .001
Caring for others in household	2.08	1.22	1.20	1.09	0.87	14.05	< .001	0.32	< .001
Schooling activities	0.65	0.91	0.46	0.69	0.18	4.65	< .001	0.09	.013
Child play and learning	1.07	0.97	1.19	1.02	-0.12	-2.20	.028	0.06	.179
Personal care and leisure	2.52	1.21	3.70	1.86	-1.17	-14.20	< .001	0.31	< .001
Sleep	8.18	1.22	8.01	1.13	0.18	2.90	.004	0.08	.040

Note: N = 663 couples. K-S indicates the Kolmogorov–Smirnov (K–S) test to determine the equality of distribution.

Table 3: Unstandardised regression coefficients for time use categories by education

	Paid labour	Farm and family enterprise	Unpaid care	Sleep	Personal care and leisure
			Panel A: Mothers' time use		
Neither have formal education	*Ref*	*Ref*	*Ref*	*Ref*	*Ref*
Mother only has formal education	-0.223	-0.160	0.248	-0.101	0.236
	(0.228)	(0.234)	(0.242)	(0.152)	(0.149)
Father only has formal education	-0.244	-0.344	0.619**	-0.238+	0.206
	(0.207)	(0.212)	(0.221)	(0.138)	(0.135)
Both have formal education	0.047	-0.211	0.447+	-0.360*	0.078
	(0.218)	(0.223)	(0.231)	(0.145)	(0.142)
Constant	0.701+	5.772***	5.970***	9.125***	2.432***
	(0.405)	(0.415)	(0.431)	(0.270)	(0.264)
			Panel B: Fathers' time use		
Neither have formal education	*Ref*	*Ref*	*Ref*	*Ref*	*Ref*
Mother only has formal education	0.029	-0.080	0.173	-0.185	-0.108
	(0.333)	(0.264)	(0.324)	(0.137)	(0.211)
Father only has formal education	0.397	-0.368	0.497+	-0.255*	-0.167
	(0.303)	(0.241)	(0.294)	(0.124)	(0.192)
Both have formal education	0.843**	-0.835***	0.713*	-0.317*	-0.380+
	(0.318)	(0.252)	(0.309)	(0.131)	(0.201)
Constant	1.190*	7.900***	2.747***	8.649***	4.209***
	(0.591)	(0.470)	(0.575)	(0.243)	(0.374)
			Panel C: Couples' time use (mother–father difference)		
Neither have formal education	*Ref*			*Ref*	*Ref*
Mother only has formal education	-0.252	-0.080	0.075	0.085	0.344
	(0.366)	(0.313)	(0.391)	(0.199)	(0.252)
Father only has formal education	-0.641+	0.025	0.122	0.017	0.373
	(0.333)	(0.284)	(0.356)	(0.181)	(0.229)
Both have formal education	-0.796*	0.625*	-0.267	-0.043	0.457+
	(0.349)	(0.298)	(0.373)	(0.190)	(0.240)
Constant	-0.489	-2.127***	3.223***	0.475	-1.776***
	(0.650)	(0.555)	(0.694)	(0.354)	(0.447)

Note: Unstandardised regression coefficients are shown with standard errors in parentheses. Unpaid labour is the sum of 'Child play and learning', 'Schooling activities', 'Household tasks', and 'Caring for others in household'. Control variables include parent age, number of children, household asset index, and age of youngest child. *** *p*<.001, ** *p*<.01, * *p*<.05, + *p*<.10.

Table 4: Unstandardised regression coefficients for unpaid care time use categories by education

	Child play and learning	Schooling activities	Caring for others in household	Household tasks
Panel A: Mothers' time use				
Neither have formal education	*Ref*	*Ref*	*Ref*	*Ref*
Mother only has formal education	0.153	0.042	0.121	-0.067
	(0.121)	(0.111)	(0.130)	(0.148)
Father only has formal education	0.031	0.166	0.336**	0.086
	(0.110)	(0.101)	(0.118)	(0.135)
Both have formal education	0.244*	0.085	0.118	-0.001
	(0.115)	(0.106)	(0.124)	(0.142)
Constant	0.766***	0.334+	1.054***	3.816***
	(0.214)	(0.198)	(0.231)	(0.263)
Panel B: Fathers' time use				
Neither have formal education	*Ref*	*Ref*	*Ref*	*Ref*
Mother only has formal education	-0.049	0.123	0.171	0.099
	(0.119)	(0.082)	(0.130)	(0.150)
Father only has formal education	0.081	-0.023	0.317**	0.018
	(0.109)	(0.075)	(0.118)	(0.136)
Both have formal education	0.141	0.117	0.419***	0.013
	(0.114)	(0.078)	(0.124)	(0.143)
Constant	0.696**	0.002	0.446+	0.909***
	(0.212)	(0.146)	(0.231)	(0.266)
Panel C: Couples' time use (mother–father difference)				
Neither have formal education	*Ref*	*Ref*	*Ref*	*Ref*
Mother only has formal education	0.201	-0.081	-0.050	-0.166

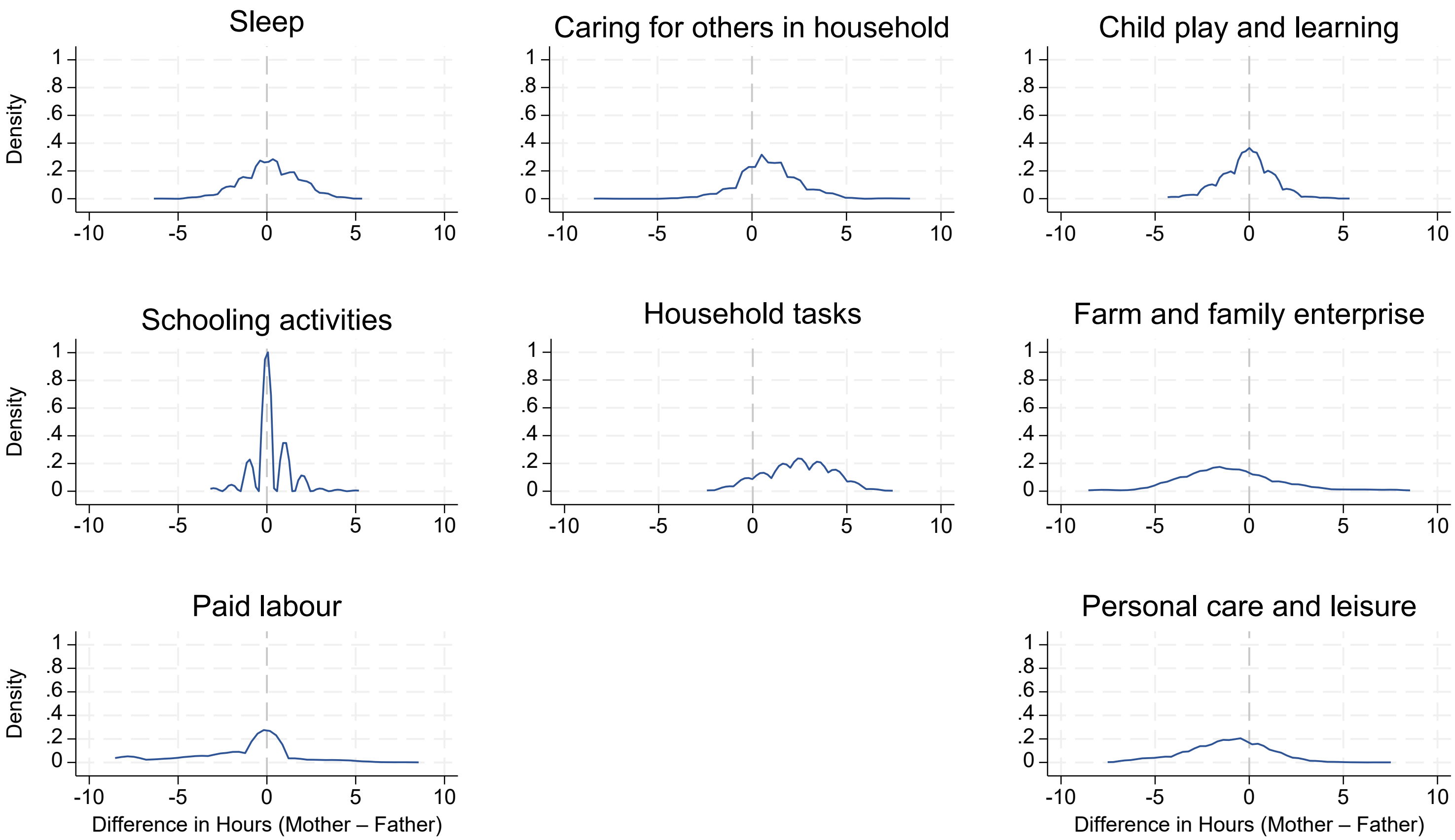
	(0.167)	(0.131)	(0.186)	(0.211)
Father only has formal education	-0.050	0.189	0.019	0.069
	(0.152)	(0.119)	(0.170)	(0.192)
Both have formal education	0.103	-0.032	-0.301+	-0.013
	(0.160)	(0.125)	(0.178)	(0.201)
Constant	0.070	0.332	0.608+	2.908***
	(0.297)	(0.232)	(0.331)	(0.374)

Note: Unstandardised regression coefficients are shown with standard errors in parentheses. Control variables include parent age, number of children, household asset index, and age of youngest child. *** p<.001, ** p<.01, * p<.05, + p<.10.

Figure 1: Histograms of mothers' and fathers' time use in hours

Note: N = 663 couples.

Figure 2: Kernel density plot of intrahousehold differences of mother–father time use in hours



Note: N = 663 couples. Non-parametric distribution (estimated using an Epanechnikov kernel function) of the difference in intrahousehold allocation of hours. These differences are calculated as the mother's hours minus her spouse's, such that values greater than zero represent mothers reporting more hours on each activity than fathers.

References

Anderson, S. and Eswaran, M. (2009) ‘What Determines Female Autonomy? Evidence from Bangladesh’, *Journal of Development Economics* 90(2), pp. 179–191. https://doi.org/10.1016/j.jdeveco.2008.10.004.

Andrew, A., Cattan, S., Costa Dias, M., Farquharson, C., Kraftman, L., Krutikova, S. *et al*. (2020) ‘Family Time Use and Home Learning During the COVID-19 Lockdown’, Institute for Fiscal Studies. https://doi.org/10.1920/re.ifs.2020.0178.

Augsburg, B., Attanasio, O.P., Dreibelbis, R., Nketsia-Amponsah, R., Phimister, A., Wolf, S. *et al*. (2022) ‘Lively Minds: Improving Health and Development through Play—a Randomized Controlled Trial Evaluation of a Comprehensive ECCE Programme at Scale in Ghana’, *BMJ Open* 12, p. e061571. https://doi.org/10.1136/bmjopen-2022-061571.

Bornstein, M.H. (2015) ‘Children’s Parents’, in *Ecological Settings and Processes in Developmental Systems* (pp. 55–132), Vol. 4 of *Handbook of Child Psychology and Developmental Science*, 7th ed., Wiley, Hoboken, NJ. https://doi.org/10.1002/9781118963418.childpsy403.

Charmes, J. (2006) ‘A Review of Empirical Evidence on Time Use in Africa from UN-Sponsored Surveys’, in *Gender, Time Use, and Poverty in Sub-Saharan Africa* (pp. 39–72), World Bank, Washington, DC.

Cohen, S. (2004) ‘Social Relationships and Health’, *American Psychologist* 59(8), pp. 676–684. https://doi.org/10.1037/0003-066X.59.8.676.

Conger, R.D. and Donnellan, M.B. (2007) ‘An Interactionist Perspective on the Socioeconomic Context of Human Development’, *Annual Review of Psychology* 58, pp. 175–199. https://doi.org/10.1146/annurev.psych.58.110405.085551.

Craig, L. and Mullan, K. (2013) ‘Parental Leisure Time: A Gender Comparison in Five Countries’, *Social Politics* 20(3), pp. 329–357. https://doi.org/10.1093/sp/jxt002.

Cunha, F., Heckman, J.J. and Schennach, S.M. (2010) ‘Estimating the Technology of Cognitive and Noncognitive Skill Formation’, *Econometrica* 78(3), pp. 883–931. https://doi.org/10.3982/ECTA6551.

Del Boca, D., Flinn, C. and Wiswall, M. (2014) ‘Household Choices and Child Development’, *The Review of Economic Studies* 81, pp. 137–185.

Doss, C. (2013) ‘Intrahousehold Bargaining and Resource Allocation in Developing Countries’, *The World Bank Research Observer* 28(1), pp. 52–78. https://doi.org/10.1093/wbro/lkt001.

Dowd, A.J., Pisani, L., Dusable, C. and Howell, H.J. (2018) *UNICEF Think Piece Series: Parents and Caregivers*. UNICEF Eastern and Southern Africa Regional Office, Nairobi.

Duflo, E. (2012) 'Women Empowerment and Economic Development', *Journal of Economic Literature* 50(4), pp. 1051–1079.

Evans, D.K. and Jakiela, P. (2024) 'The Role of Fathers in Promoting Early Childhood Development in Low- and Middle-Income Countries: A Review of the Evidence', *The World Bank Research Observer* 9(1). https://doi.org/10.1093/wbro/lkae009.

Ford, K., van der Gaag, N., Curtin, F. and Tanima, T. (2025) 'Lightening the Load: New Evidence on the Impacts of Unpaid Care Work on Women and Girls', *Policy Brief 62*, Young Lives, Oxford. https://www.younglives.org.uk/publications/lightening-load-new-evidence-impacts-unpaid-care-work-women-and-girls.

Ghana Ministry of Education and UNICEF (2020) 'Ghana Education Fact Sheet: Analysis for Learning and Equity Using MICS Data', UNICEF. https://data.unicef.org/wp-content/uploads/2019/07/Ghana_Fact_Sheets_Digital.pdf.

Ghana Statistical Service (2013) *2010 Population and Housing Census: National Analytical Report*, Accra.

Ghana Statistical Service (2015) 'Ghana Poverty Mapping Report', Accra. https://www2.statsghana.gov.gh/docfiles/publications/POVERTY%20MAP%20FOR%20GHANA-05102015.pdf.

Ghana Statistical Service (2022) *Ghana 2021 Population and Housing Census: General Report Highlights (Vol. 3)*. https://census2021.statsghana.gov.gh/gssmain/fileUpload/reportthemelist/Volume%203%20Highlights.pdf.

Guryan, J., Hurst, E. and Kearney, M. (2008) 'Parental Education and Parental Time with Children', *Journal of Economic Perspectives* 22(3), pp. 23–46. https://doi.org/10.1257/jep.22.3.23.

Hsin, A. and Felfe, C. (2014) 'When Does Time Matter? Maternal Employment, Children's Time with Parents, and Child Development', *Demography* 51, pp. 1867–1894.

Hyde, E., Greene, M.E. and Darmstadt, G.L. (2020) 'Time Poverty: Obstacle to Women's Human Rights, Health and Sustainable Development', *Journal of Global Health* 10(2), p. 020313. https://doi.org/10.7189/jogh.10.020313.

ILO (2018) 'Care Work and Care Jobs for the Future of Decent Work', Geneva. https://www.ilo.org/publications/major-publications/care-work-and-care-jobs-future-decent-work.

ILO (2023) ‘World Employment and Social Outlook: Trends 2023’. https://doi.org/10.54394/SNCP1637.

Jeong, J., McCoy, D.C., Yousafzai, A.K., Salhi, C. and Fink. G. (2016) ‘Paternal Stimulation and Early Child Development in Low- and Middle-Income Countries’, *Pediatrics* 138(4), p. e20161357. https://doi.org/10.1542/peds.2016-1357.

Jeong, J., Franchett, E.E., Ramos de Oliveira, C.V., Rehmani, K., Yousafzai, A.K. (2021) ‘Parenting interventions to promote early child development in the first three years of life: A global systematic review and meta-analysis’, *PloS Med*. 18(5), p. e1003602. doi: 10.1371/journal.pmed.1003602.

Kalil, A., Ryan, R. and Corey, M. (2012) ‘Diverging Destinies: Maternal Education and the Developmental Gradient in Time with Children’, *Demography* 49(4), pp. 1361–1383. https://doi.org/10.1007/s13524-012-0129-5.

Kalil, A., Mayer, S., Delgado, W. and Gennetian, L.A. (2023) ‘Education Gradients in Parental Time Investment and Subjective Well-Being’, *NBER Working Paper* 31712. https://www.nber.org/papers/w31712.

Kes, A. and Swaminathan, H. (2006) ‘Gender and Time Poverty in Sub-Saharan Africa’, World Bank, Washington, DC. https://documents.worldbank.org/en/publication/documents-reports/documentdetail/493351468011447522/gender-and-time-poverty-in-sub-saharan-africa.

Kimmel, J. and Connelly, R. (2007) ‘Mothers’ Time Choices: Caregiving, Leisure, Home Production, and Paid Work’, *Journal of Human Resources* 42(3). pp. 643–681. https://doi.org/10.3368/jhr.XLII.3.643.

Kleven, H., Landais, C. and Leite-Mariante, G. (2024) ‘The Child Penalty Atlas’, *Review of Economic Studies* 00, pp. 1–34. https://doi.org/10.1093/restud/rdae104.

Kosakowska-Berezecka, N., Sawicki, A., Celikkol, G., Bosson, J.K., Van Laar, C., Van Rossum, A. et al. *et al*. (2025) ‘Does Culture Moderate Gender Stereotypes? Individualism Predicts Communal (but Not Agentic) Prescriptions for Men Across 62 Nations’, *Social Psychological and Personality Science* 16(4), pp. 359–372. https://doi.org/10.1177/19485506231221913.

McCann, J.K., Freire, S., Ramos de Oliveira, C.V., Ochieng, M. and Jeong, J. (2024) ‘Father Involvement Is a Protective Factor for Maternal Mental Health in Western Kenya’, *SSM - Mental Health* 5, p. 100318. https://doi.org/10.1016/j.ssmmh.2024.100318.

McLoyd, V.C. (1998) ‘Socioeconomic Disadvantage and Child Development’, *American Psychologist* 53(2), pp. 185–204. https://doi.org/10.1037/0003-066X.53.2.185.

Pressman, S.D., Matthews, K.A., Cohen, S., Martire, L.M., Scheier, M., Baum, A. *et al.* (2009) ‘Association of Enjoyable Leisure Activities with Psychological and

Physical Well-Being', *Psychosomatic Medicine* 71(7), pp. 725–732. https://doi.org/10.1097/PSY.0b013e3181ad7978.

Saaka, M., Awini, S., Kizito, F. and Hoeschle-Zeledon, I. (2023) 'Fathers' Level of Involvement in Childcare Activities and Its Association with the Diet Quality of Children in Northern Ghana', *Public Health Nutrition* 26(4), pp. 771–778. https://doi.org/10.1017/S1368980022002142.

Sonnenberg, B., Riediger, M., Wrzus, C. and Wagner, C.G. (2011) 'Measuring Time Use in Surveys—How Valid Are Time Use Questions in Surveys?' *SOEP Paper No. 390*. https://www.diw.de/documents/publikationen/73/diw_01.c.373411.de/diw_sp0390.pdf.

Tamis-LeMonda, C.S., Shannon, J.D., Cabrera, N.J. and Lamb, M.E. (2004) 'Fathers and Mothers at Play with Their 2- and 3-Year-Olds: Contributions to Language and Cognitive Development', *Child Development* 75(6), p.. 1806–1820. https://doi.org/10.1111/j.1467-8624.2004.00818.x.

UN Women (2022) *A Toolkit on Paid and Unpaid Care Work: From 3Rs to 5Rs*. https://www.unwomen.org/sites/default/files/2022-06/A-toolkit-on-paid-and-unpaid-care-work-en.pdf.

United Nations Development Programme (2024) 'The Future Value of Work in Ghana: Pathways to Sustainable Jobs, Ghana National Human Development Report'. https://statsghana.gov.gh/gssmain/fileUpload/pressrelease/Ghana_national_human_development_report.pdf.

Vikram, K., Ganguly, D. and Goli, D. (2024) 'Time Use Patterns and Household Adversities: A Lens to Understand the Construction of Gender Privilege among Children and Adolescents in India', *Social Science Research* 118, p. 102970. https://doi.org/10.1016/j.ssresearch.2023.102970.

World Bank (2012) 'World Development Report 2012: Gender Equality and Development', Washington, DC. https://openknowledge.worldbank.org/handle/10986/4391.

World Bank (n.d.) 'Ghana', in *World Bank Gender Data Portal*. Accessed 18 May 2025. https://genderdata.worldbank.org/en/economies/ghana.

Yerkes, M.A., Roeters, A. and Baxter, J. (2020) 'Gender Differences in the Quality of Leisure: A Cross-National Comparison', *Community, Work & Family* 23(4), pp. 367–384. https://doi.org/10.1080/13668803.2018.1528968.

Appendix A

Table A.1 t-tests comparing household characteristics for households with and without father data

Variable	Excluded (*N* = 203)	Included (*N* = 663)			
	M or %	*M* or %	Diff.	*t*(864)	*p*-value
Region					
Bono	0.19	0.14	0.05	1.85	.064
Bono East	0.01	0.04	-0.03	-1.85	.065
North East	0.17	0.12	0.05	1.90	.058
Northern	0.16	0.18	-0.02	-0.60	.534
Oti	0.15	0.12	0.03	1.15	.257
Savanna	0.12	0.07	0.06	2.60	.009
Upper East	0.04	0.06	-0.02	-0.95	.350
Upper West	0.15	0.28	-0.13	-3.80	< .001
Household head ethnicity					
Mole-Dagbani	0.40	0.41	-0.01	-0.25	.805
Gurma	0.15	0.14	0.01	0.15	.874
Akan	0.15	0.11	0.05	1.85	.068
Grusi	0.06	0.17	-0.11	-3.80	< .001
Other	0.23	0.17	0.65	2.06	.039
Household has at least one elderly person	0.20	0.21	-0.01	0.34	.732
Age of youngest child in household in years	3.24	3.03	0.20	1.40	.155
Total household size	6.29	6.37	-0.08	-0.45	.666
Mother has some formal education	0.47	0.46	0.01	0.25	.784
Sum of 11 household assets	2.58	2.87	-0.29	-1.70	.087
Mother age	36.72	34.36	2.35	3.65	.001

Note: N = 866 households.

Table A.2 Mother and father education

	Father education					Total
	None	Primary	Junior high	Senior high	Post-secondary	
None	225 33.99	63 9.67	33 4.98	22 3.32	13 1.96	357 53.93
Primary	57 8.61	30 4.53	26 3.93	8 1.21	9 1.36	130 19.64
Junior high	35 5.29	26 3.93	42 6.34	26 3.93	15 2.27	144 21.75
Senior high	6 0.91	3 0.45	4 0.60	8 1.21	2 0.30	3 3.47
Post-secondary	0 0.00	0 0.00	1 0.15	1 12.50	6 0.91	8 1.21
Total	323 48.79	121 18.28	106 16.01	65 9.82	45 6.80	662 100.00

Appendix B

Now I am going to ask you some questions about the activities YOU carry out on a typical day.

Materials: Two adult time allocation cards with eight daily activities and 24 counters.

ENUMERATOR: Start by explaining to the respondent that you want to know which activities they carry out on a TYPICAL day. Show the respondent the 24 counters and explain that these represent 24 hours of a typical day (from Monday to Friday, excluding holidays, festivals, etc.). Ask the respondent to tell you about their typical daily activities, starting from when they usually wake up in the morning to when they usually sleep. Show the respondent the two adult time allocation cards with a picture for each of the eight activities. Allocate the 24 counters to the relevant categories based on information you got from the respondent. Remember that items about work include travelling times. Make sure all 24 counters are allocated. Now ask the respondent to confirm if they represent his/her typical day and reallocate the counters if needed to reflect what the respondent says. Record the final number of counters allocated to each activity.

1. **Paid labour outside the household ('Paid labour')**: Time spent doing paid (remunerated) work or activities outside of the household or for someone not in the household (including travelling time to work).
2. **Farm and family enterprise**: Time spent on tasks on the family farm (e.g. harvesting shea nuts), cattle herding, or other family business (e.g. making baskets), or shepherding (not just farming).
3. **Personal care and leisure**: Time spent on leisure activities (eating, drinking, bathing, watching TV, socialising with other adults outside of your household; attending mosque/church, prayer, funerals etc.).
4. **Sleep**: Time spent sleeping.

Unpaid care:

1. **Household tasks**: Time spent doing domestic tasks (fetching water, firewood, cleaning, cooking, washing, ironing, shopping, etc.).
2. **Caring for others in the household**: Time spent taking care of other household members (including ill or elderly adult members, e.g. feeding, dressing, showering, etc., and small children, e.g. feeding, dressing, showering, etc). Excludes playing, reading, telling stories, and looking at picture books with small children that are members of the household.
3. **Schooling activities**: Time spent taking/picking up a household member to/from school, nursery, kindergarten, etc., including spending time at a household member's school, nursery, kindergarten, etc. to actively contribute to the school's activities or to talk to teachers about household members.

4. **Child play and learning**: Time spent on play with small children that are members of the household, reading books/telling stories, looking at picture books with them.

Appendix C

Table C.1: Bivariate correlations between mothers’ and fathers’ time use

No.	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Mother															
1	Sleep	--														
2	Caring for others in HH	-.28*	--													
3	Schooling activities	-.29*	.13*	--												
4	Household tasks	-.10*	-.03	-.29*	--											
5	Farm and family enterprise	.13*	-.38*	-.31*	-.03	--										
6	Paid labour	-.25*	-.07	.10*	-.22*	-.50*	--									
7	Child play and learning	-.29*	.14*	.29*	-.27*	-.30*	.00	--								
8	Personal care and leisure	-.01	-.11*	-.16*	-.06	-.17*	-.24*	-.06	--							
	Father															
9	Sleep	.11*	-.21*	-.10*	.06	.07	.00	-.03	.02	--						
10	Caring for others in household	-.09*	.04	.18*	-.02	-.03	-.05	.10*	.00	-.25*	--					
11	Schooling activities	-.15*	.09*	.22*	-.16*	-.05	.06	.10*	-.03	-.25*	.20*	--				
12	Household tasks	-.04	.07	.12*	-.05	-.06	.07	-.05	-.03	-.16*	.11*	.21*	--			
13	Farm and family enterprise	.06	.02	-.10*	.16*	.16*	-.19*	-.13*	-.04	.00	-.01	-.14*	-.06	--		
14	Paid labour	-.01	-.07	.07	-.16*	-.16*	.21*	.11*	.03	-.14*	-.23*	-.07	-.14*	-.73*	--	
15	Child play and learning	-.03	.08*	.07	.01	-.02	.00	.06	-.13*	-.16*	.30*	.17*	-.06	.09*	-.28*	--
16	Personal care and leisure	.03	.06	-.21*	.11*	.09*	-.14*	-.09*	.09*	.03	-.38*	-.28*	-.36*	-.06	-.14*	-.33*

Note: N = 663 couples. HH = household.

Table C.2: Two-sample t-test results of mothers' time use by mother's education

	No formal education		Some formal education		Two-sample *t*-test			Two-sample K-S test	
	M	*SD*	*M*	*SD*	Diff.	*t*(661)	*p*	*D*	*p*
Panel A: Mother's time use by mother's education									
Sleep	8.16	1.31	8.21	1.11	-0.06	-0.58	.561	0.05	.735
Caring for others in household	2.20	1.26	1.93	1.15	0.27	2.85	.005	0.11	.032
Schooling activities	0.65	0.96	0.64	0.85	-0.01	0.08	.936	0.04	.939
Household tasks	3.62	1.24	3.43	1.26	0.19	1.92	.054	0.10	.100
Farm and family enterprise	5.10	1.86	4.84	2.17	0.24	1.54	.125	0.06	.518
Paid labour	0.79	1.58	1.18	2.08	-0.39	-2.76	.006	0.08	.255
Child play and learning	1.02	0.99	1.14	0.93	-0.12	-1.58	.113	0.12	.013
Personal care and leisure	2.46	1.09	2.60	1.33	-0.14	-1.43	.152	0.06	.561
Panel B: Father's time use by father's education									
Sleep	8.01	1.10	8.01	1.17	0.00	0.00	.997	0.03	1.001
Caring for others in household	1.19	1.07	1.21	1.11	-0.02	-0.22	.826	0.03	.998
Schooling activities	.52	0.69	0.42	0.67	0.10	1.86	.062	0.09	.181
Household tasks	1.13	1.29	1.12	1.11	0.02	0.14	.888	0.10	.097
Farm and family enterprise	6.33	1.98	5.56	2.50	0.77	4.37	< .001	0.14	.003
Paid labour	1.74	2.41	3.00	3.08	-1.27	-5.84	< .001	0.19	< .001
Child play and learning	1.24	1.10	1.14	0.94	0.10	1.32	.189	0.06	.652
Personal care and leisure	3.85	1.91	3.55	1.80	0.29	2.04	.042	0.07	.471

Note: Panel A n = 354 (53.4%) mothers for no formal education, and n = 309 (46.6%) mothers for some formal education. Panel B n = 322 (48.5%) fathers for no formal education and n = 341 (51.5%) fathers for some formal education.

Table C.3a: Unstandardised multiple regression coefficients predicting mothers' time use

Variables	Paid labour	Farm and family enterprise	Unpaid care	Sleep	Personal care and leisure
Mother only has some education	-0.223	-0.160	0.248	-0.101	0.236
	(0.228)	(0.234)	(0.242)	(0.152)	(0.149)
Father only has some education	-0.244	-0.344	0.619**	-0.238+	0.206
	(0.207)	(0.212)	(0.221)	(0.138)	(0.135)
Both parents have some education	0.047	-0.211	0.447+	-0.360*	0.078
	(0.218)	(0.223)	(0.231)	(0.145)	(0.142)
No. children in household	-0.100*	0.153**	-0.018	-0.057+	0.022
	(0.046)	(0.047)	(0.049)	(0.031)	(0.030)
Household assets index	0.233**	-0.277***	0.097	-0.125*	0.072
	(0.081)	(0.083)	(0.086)	(0.054)	(0.053)
Mother age in years (mean-centred)	-0.006	0.008	0.006	-0.008	0.001
	(0.011)	(0.011)	(0.011)	(0.007)	(0.007)
Father age in years (mean-centred)	-0.014+	-0.005	0.014+	-0.005	0.010+
	(0.008)	(0.008)	(0.009)	(0.005)	(0.005)
Youngest child age in household	0.015	0.147***	-0.144**	0.004	-0.022
	(0.041)	(0.042)	(0.044)	(0.027)	(0.027)
Region: Bono East	-0.474	0.127	-0.577	-0.489+	1.413***
	(0.419)	(0.429)	(0.445)	(0.279)	(0.273)
Region: North East	0.913**	-2.021***	1.647***	-0.555*	0.016
	(0.339)	(0.348)	(0.361)	(0.226)	(0.222)
Region: Northern	0.676*	-2.239***	2.590***	-1.237***	0.211
	(0.330)	(0.338)	(0.351)	(0.220)	(0.216)
Region: Oti	1.606***	-2.432***	0.405	-0.115	0.536*
	(0.356)	(0.365)	(0.379)	(0.238)	(0.233)
Region: Savanna	-0.231	-2.159***	3.527***	-0.984***	-0.153
	(0.380)	(0.389)	(0.404)	(0.253)	(0.248)
Region: Upper East	0.933*	-2.181***	1.799***	-0.491+	-0.060
	(0.399)	(0.409)	(0.424)	(0.266)	(0.261)
Region: Upper West	0.530	-0.804*	0.727*	-0.575**	0.122
	(0.333)	(0.341)	(0.354)	(0.222)	(0.217)
Ethnicity: Gurma	0.291	0.609*	-0.919***	0.558***	-0.539***
	(0.236)	(0.242)	(0.251)	(0.157)	(0.154)
Ethnicity: Akan	0.533	-0.602+	0.425	-0.159	-0.198
	(0.336)	(0.345)	(0.358)	(0.225)	(0.220)
Ethnicity: Grusi	0.148	-0.789**	1.317***	-0.217	-0.459**
	(0.263)	(0.270)	(0.280)	(0.176)	(0.172)
Ethnicity: Other	-0.232	-0.400	0.677*	-0.137	0.092
	(0.298)	(0.306)	(0.317)	(0.199)	(0.195)
Primary caregiver changed	0.232	-0.761*	0.582	-0.011	-0.042
	(0.338)	(0.346)	(0.359)	(0.225)	(0.220)
Household has member aged 60+	-0.243	0.192	0.184	0.041	-0.175
	(0.176)	(0.180)	(0.187)	(0.117)	(0.115)
Constant	0.701+	5.772***	5.970***	9.125***	2.432***
	(0.405)	(0.415)	(0.431)	(0.270)	(0.264)
R-squared	0.113	0.224	0.230	0.105	0.130

Note: N = 663 couples. Unstandardised regression coefficients are shown with standard errors in parentheses. The reference group for education is neither parent has formal education, the reference group for region is Bono, and the reference group for ethnicity is Mole-Dagbani.
*** *p*<.001, ** *p*<.01, * *p*<.05, + *p*<.10

Table C.3b: Unstandardised multiple regression coefficients predicting fathers' time use

Variables	Paid labour	Farm and family enterprise	Unpaid labour	Sleep	Personal care and leisure
Mother only has some education	0.029	-0.080	0.173	-0.185	-0.108
	(0.333)	(0.264)	(0.324)	(0.137)	(0.211)
Father only has some education	0.397	-0.368	0.497+	-0.255*	-0.167
	(0.303)	(0.241)	(0.294)	(0.124)	(0.192)
Both parents have some education	0.843**	-0.835***	0.713*	-0.317*	-0.380+
	(0.318)	(0.252)	(0.309)	(0.131)	(0.201)
No. children in household	-0.076	0.003	-0.002	0.041	0.048
	(0.067)	(0.053)	(0.065)	(0.028)	(0.043)
Household assets index	0.139	-0.174+	0.181	-0.042	-0.147*
	(0.118)	(0.094)	(0.115)	(0.048)	(0.075)
Mother age in years (mean-centred)	-0.022	0.016	0.038*	-0.012+	-0.009
	(0.016)	(0.012)	(0.015)	(0.006)	(0.010)
Father age in years (mean-centred)	-0.006	-0.007	0.009	0.004	-0.003
	(0.012)	(0.009)	(0.011)	(0.005)	(0.007)
Youngest child age in household	0.004	0.059	-0.118*	0.011	0.010
	(0.060)	(0.048)	(0.058)	(0.025)	(0.038)
Region: Bono East	3.923***	-3.917***	-2.880***	-0.443+	2.462***
	(0.611)	(0.486)	(0.594)	(0.251)	(0.387)
Region: North East	1.298**	-1.455***	2.935***	-0.902***	-1.605***
	(0.495)	(0.394)	(0.482)	(0.204)	(0.314)
Region: Northern	0.540	-1.809***	2.774***	-0.856***	-0.381
	(0.482)	(0.383)	(0.469)	(0.198)	(0.305)
Region: Oti	1.479**	-0.507	-0.090	-0.803***	-0.257
	(0.520)	(0.414)	(0.506)	(0.214)	(0.329)
Region: Savanna	-0.452	-0.030	0.898+	-1.385***	1.277***
	(0.554)	(0.440)	(0.539)	(0.228)	(0.351)
Region: Upper East	1.241*	-2.208***	0.236	-0.513*	0.520
	(0.583)	(0.463)	(0.567)	(0.239)	(0.369)
Region: Upper West	1.944***	-2.316***	2.247***	-0.983***	-0.937**
	(0.486)	(0.386)	(0.473)	(0.200)	(0.308)
Ethnicity: Gurma	-0.793*	0.356	1.366***	0.177	-0.524*
	(0.344)	(0.274)	(0.335)	(0.141)	(0.218)
Ethnicity: Akan	1.575**	-2.057***	0.601	0.389+	-0.282
	(0.491)	(0.390)	(0.478)	(0.202)	(0.311)
Ethnicity: Grusi	-0.054	-0.192	0.281	-0.071	-0.263
	(0.384)	(0.305)	(0.374)	(0.158)	(0.243)
Ethnicity: Other	-0.183	-0.516	1.053*	0.273	-0.448
	(0.436)	(0.346)	(0.424)	(0.179)	(0.276)
Primary caregiver changed	-0.166	-0.366	0.419	-0.031	0.050
	(0.493)	(0.392)	(0.479)	(0.203)	(0.312)
Household has member aged 60+	-0.298	-0.067	0.123	0.120	0.166
	(0.257)	(0.204)	(0.250)	(0.106)	(0.163)
Constant	1.190*	7.900***	2.747***	8.649***	4.209***
	(0.591)	(0.470)	(0.575)	(0.243)	(0.374)
R-squared	0.211	0.231	0.256	0.158	0.257

Note: N = 663 couples. Unstandardised regression coefficients are shown with standard errors in parentheses. The reference group for education is neither parent has formal education, the reference group for region is Bono, and the reference group for ethnicity is Mole-Dagbani.
*** *p*<.001, ** *p*<.01, * *p*<.05, + *p*<.10

Table C.3c: Unstandardised multiple regression coefficients predicting intrahousehold differences in time use

Variables	Paid labour	Farm and family enterprise	Unpaid care	Sleep	Personal care and leisure
Mother only has some education	-0.252	-0.080	0.075	0.085	0.344
	(0.366)	(0.313)	(0.391)	(0.199)	(0.252)
Father only has some education	-0.641+	0.025	0.122	0.017	0.373
	(0.333)	(0.284)	(0.356)	(0.181)	(0.229)
Both parents have some education	-0.796*	0.625*	-0.267	-0.043	0.457+
	(0.349)	(0.298)	(0.373)	(0.190)	(0.240)
No. children in household	-0.023	0.150*	-0.016	-0.098*	-0.027
	(0.074)	(0.063)	(0.079)	(0.040)	(0.051)
Household assets index	0.094	-0.102	-0.084	-0.083	0.219*
	(0.130)	(0.111)	(0.139)	(0.071)	(0.089)
Mother age in years (mean-centred)	0.016	-0.008	-0.032+	0.004	0.010
	(0.017)	(0.015)	(0.018)	(0.009)	(0.012)
Father age in years (mean-centred)	-0.008	0.002	0.006	-0.009	0.013
	(0.013)	(0.011)	(0.014)	(0.007)	(0.009)
Youngest child age in household	0.011	0.087	-0.026	-0.007	-0.032
	(0.066)	(0.056)	(0.070)	(0.036)	(0.045)
Region: Bono East	-4.397***	4.043***	2.303**	-0.046	-1.049*
	(0.672)	(0.574)	(0.718)	(0.366)	(0.462)
Region: North East	-0.385	-0.566	-1.289*	0.346	1.622***
	(0.545)	(0.465)	(0.582)	(0.296)	(0.375)
Region: Northern	0.136	-0.430	-0.185	-0.381	0.591
	(0.530)	(0.453)	(0.566)	(0.288)	(0.364)
Region: Oti	0.127	-1.925***	0.496	0.689*	0.792*
	(0.573)	(0.489)	(0.611)	(0.311)	(0.393)
Region: Savanna	0.221	-2.129***	2.628***	0.401	-1.430***
	(0.610)	(0.521)	(0.651)	(0.332)	(0.419)
Region: Upper East	-0.308	0.028	1.562*	0.022	-0.580
	(0.641)	(0.547)	(0.684)	(0.349)	(0.440)
Region: Upper West	-1.415**	1.513***	-1.520**	0.408	1.058**
	(0.535)	(0.456)	(0.571)	(0.291)	(0.367)
Ethnicity: Gurma	1.084**	0.253	-2.285***	0.381+	-0.015
	(0.379)	(0.323)	(0.404)	(0.206)	(0.260)
Ethnicity: Akan	-1.042+	1.455**	-0.175	-0.547+	0.084
	(0.540)	(0.461)	(0.577)	(0.294)	(0.371)
Ethnicity: Grusi	0.203	-0.597+	1.036*	-0.146	-0.196
	(0.423)	(0.361)	(0.451)	(0.230)	(0.290)
Ethnicity: Other	-0.049	0.116	-0.376	-0.410	0.540
	(0.479)	(0.409)	(0.512)	(0.261)	(0.329)
Primary caregiver changed	0.398	-0.395	0.163	0.021	-0.092
	(0.542)	(0.463)	(0.579)	(0.295)	(0.373)
Household has member aged 60+	0.055	0.259	0.062	-0.079	-0.341+
	(0.283)	(0.241)	(0.302)	(0.154)	(0.194)
Constant	-0.489	-2.127***	3.223***	0.475	-1.776***
	(0.650)	(0.555)	(0.694)	(0.354)	(0.447)
R-squared	0.162	0.279	0.185	0.075	0.193

Note: N = 663 couples. Unstandardised regression coefficients are shown with standard errors in parentheses. The reference group for education is neither parent has formal education, the reference group for region is Bono, and the reference group for ethnicity is Mole-Dagbani.
*** *p*<.001, ** *p*<.01, * *p*<.05, + *p*<.10

Table C.4a: Unstandardised multiple regression coefficients predicting mothers' unpaid care time

Variables	Child play and learning	Schooling activities	Caring for others in household	Household tasks
Mother only has some education	0.153	0.042	0.121	-0.067
	(0.121)	(0.111)	(0.130)	(0.148)
Father only has some education	0.031	0.166	0.336**	0.086
	(0.110)	(0.101)	(0.118)	(0.135)
Both parents have some education	0.244*	0.085	0.118	-0.001
	(0.115)	(0.106)	(0.124)	(0.142)
No. children in household	-0.008	-0.008	0.028	-0.029
	(0.024)	(0.023)	(0.026)	(0.030)
Household assets index	0.011	0.063	0.008	0.015
	(0.043)	(0.039)	(0.046)	(0.053)
Mother age in years (mean-centred)	0.004	0.001	-0.001	0.001
	(0.006)	(0.005)	(0.006)	(0.007)
Father age in years (mean-centred)	0.005	-0.000	0.006	0.003
	(0.004)	(0.004)	(0.005)	(0.005)
Youngest child age in household	-0.037+	-0.012	-0.053*	-0.042
	(0.022)	(0.020)	(0.023)	(0.027)
Region: Bono East	0.087	-0.155	-0.136	-0.373
	(0.221)	(0.204)	(0.238)	(0.272)
Region: North East	0.253	0.612***	0.752***	0.030
	(0.179)	(0.166)	(0.193)	(0.221)
Region: Northern	0.602***	0.200	1.807***	-0.019
	(0.175)	(0.161)	(0.188)	(0.215)
Region: Oti	0.224	-0.063	0.752***	-0.507*
	(0.189)	(0.174)	(0.203)	(0.232)
Region: Savanna	0.215	-0.284	2.579***	1.017***
	(0.201)	(0.185)	(0.216)	(0.247)
Region: Upper East	-0.209	0.380+	0.920***	0.708**
	(0.211)	(0.195)	(0.227)	(0.260)
Region: Upper West	0.368*	0.374*	0.842***	-0.857***
	(0.176)	(0.162)	(0.190)	(0.217)
Ethnicity: Gurma	-0.224+	0.062	-0.901***	0.144
	(0.125)	(0.115)	(0.134)	(0.153)
Ethnicity: Akan	0.216	0.047	0.101	0.061
	(0.178)	(0.164)	(0.192)	(0.219)
Ethnicity: Grusi	0.313*	0.441***	0.434**	0.129
	(0.139)	(0.128)	(0.150)	(0.171)
Ethnicity: Other	0.071	0.046	0.295+	0.265
	(0.158)	(0.146)	(0.170)	(0.194)
Primary caregiver changed	0.585**	0.122	-0.121	-0.004
	(0.179)	(0.165)	(0.192)	(0.220)
Household has member aged 60+	-0.060	0.008	-0.009	0.245*
	(0.093)	(0.086)	(0.100)	(0.115)
Constant	0.766***	0.334+	1.054***	3.816***
	(0.214)	(0.198)	(0.231)	(0.263)
R-squared	0.098	0.141	0.343	0.190

Note: N = 663 couples. Unstandardised regression coefficients are shown with standard errors in parentheses. The reference group for education is neither parent has formal education, the reference group for region is Bono, and the reference group for ethnicity is Mole-Dagbani.
*** *p*<.001, ** *p*<.01, * *p*<.05, + *p*<.10

Table C.4b: Unstandardised multiple regression coefficients predicting fathers' unpaid care time

Variables	Child play and learning	Schooling activities	Caring for others in household	Household tasks
Mother only has some education	-0.049	0.123	0.171	0.099
	(0.119)	(0.082)	(0.130)	(0.150)
Father only has some education	0.081	-0.023	0.317**	0.018
	(0.109)	(0.075)	(0.118)	(0.136)
Both parents have some education	0.141	0.117	0.419***	0.013
	(0.114)	(0.078)	(0.124)	(0.143)
No. children in household	0.015	0.001	0.012	-0.044
	(0.024)	(0.017)	(0.026)	(0.030)
Household assets index	0.016	0.060*	0.056	0.091+
	(0.042)	(0.029)	(0.046)	(0.053)
Mother age in years (mean-centred)	0.012*	0.002	0.008	0.005
	(0.006)	(0.004)	(0.006)	(0.007)
Father age in years (mean-centred)	-0.001	0.003	0.005	0.006
	(0.004)	(0.003)	(0.005)	(0.005)
Youngest child age in household	-0.028	0.006	-0.008	-0.054*
	(0.021)	(0.015)	(0.023)	(0.027)
Region: Bono East	-0.854***	-0.001	-0.598*	-0.574*
	(0.219)	(0.151)	(0.239)	(0.275)
Region: North East	0.686***	0.415***	0.866***	0.696**
	(0.178)	(0.122)	(0.193)	(0.223)
Region: Northern	0.756***	0.488***	0.999***	0.263
	(0.173)	(0.119)	(0.188)	(0.217)
Region: Oti	-0.118	0.061	-0.264	0.409+
	(0.187)	(0.129)	(0.203)	(0.234)
Region: Savanna	0.383+	0.074	0.038	0.095
	(0.199)	(0.137)	(0.216)	(0.250)
Region: Upper East	-0.400+	0.324*	0.199	0.836**
	(0.209)	(0.144)	(0.228)	(0.262)
Region: Upper West	0.532**	0.576***	0.475*	0.709**
	(0.174)	(0.120)	(0.190)	(0.219)
Ethnicity: Gurma	0.580***	-0.002	0.096	0.110
	(0.123)	(0.085)	(0.134)	(0.155)
Ethnicity: Akan	0.206	-0.019	-0.078	0.266
	(0.176)	(0.121)	(0.192)	(0.221)
Ethnicity: Grusi	-0.087	0.212*	0.281+	0.175
	(0.138)	(0.095)	(0.150)	(0.173)
Ethnicity: Other	0.270+	0.091	0.271	0.243
	(0.156)	(0.108)	(0.170)	(0.196)
Primary caregiver changed	0.063	0.157	0.331+	-0.038
	(0.177)	(0.122)	(0.192)	(0.222)
Household has member aged 60+	0.050	0.006	0.115	-0.093
	(0.092)	(0.063)	(0.100)	(0.116)
Constant	0.696**	0.002	0.446+	0.909***
	(0.212)	(0.146)	(0.231)	(0.266)
R-squared	0.212	0.169	0.177	0.092

Note: N = 663 couples. Unstandardised regression coefficients are shown with standard errors in parentheses. The reference group for education is neither parent has formal education, the reference group for region is Bono, and the reference group for ethnicity is Mole-Dagbani.
*** *p*<.001, ** *p*<.01, * *p*<.05, + *p*<.10

Table C.4c: Unstandardised multiple regression coefficients predicting intrahousehold differences in unpaid care time

Variables	Child play and learning	Schooling activities	Caring for others in household	Household tasks
Mother only has some education	0.201	-0.081	-0.050	-0.166
	(0.167)	(0.131)	(0.186)	(0.211)
Father only has some education	-0.050	0.189	0.019	0.069
	(0.152)	(0.119)	(0.170)	(0.192)
Both parents have some education	0.103	-0.032	-0.301+	-0.013
	(0.160)	(0.125)	(0.178)	(0.201)

No. children in household	-0.023	-0.009	0.016	0.015
	(0.034)	(0.026)	(0.038)	(0.043)
Household assets index	-0.005	0.003	-0.049	-0.077
	(0.059)	(0.046)	(0.066)	(0.075)
Mother age in years (mean-centred)	-0.008	-0.001	-0.009	-0.004
	(0.008)	(0.006)	(0.009)	(0.010)
Father age in years (mean-centred)	0.006	-0.003	0.001	-0.003
	(0.006)	(0.005)	(0.007)	(0.007)
Youngest child age in household	-0.009	-0.018	-0.045	0.012
	(0.030)	(0.024)	(0.034)	(0.038)
Region: Bono East	0.941**	-0.155	0.462	0.201
	(0.307)	(0.240)	(0.342)	(0.387)
Region: North East	-0.434+	0.197	-0.114	-0.666*
	(0.249)	(0.194)	(0.278)	(0.314)
Region: Northern	-0.154	-0.288	0.808**	-0.282
	(0.242)	(0.189)	(0.270)	(0.305)
Region: Oti	0.341	-0.124	1.017***	-0.916**
	(0.262)	(0.204)	(0.292)	(0.329)
Region: Savanna	-0.167	-0.359+	2.541***	0.922**
	(0.278)	(0.217)	(0.310)	(0.351)
Region: Upper East	0.191	0.056	0.721*	-0.128
	(0.293)	(0.229)	(0.326)	(0.369)
Region: Upper West	-0.164	-0.202	0.367	-1.566***
	(0.244)	(0.191)	(0.272)	(0.308)
Ethnicity: Gurma	-0.805***	0.064	-0.996***	0.034
	(0.173)	(0.135)	(0.193)	(0.218)
Ethnicity: Akan	0.010	0.065	0.178	-0.205
	(0.247)	(0.193)	(0.275)	(0.311)
Ethnicity: Grusi	0.400*	0.229	0.154	-0.047
	(0.193)	(0.151)	(0.215)	(0.243)
Ethnicity: Other	-0.198	-0.045	0.024	0.022
	(0.219)	(0.171)	(0.244)	(0.276)
Primary caregiver changed	0.522*	-0.035	-0.452	0.033
	(0.248)	(0.193)	(0.276)	(0.312)
Household has member aged 60+	-0.110	0.001	-0.124	0.338*
	(0.129)	(0.101)	(0.144)	(0.163)
Constant	0.070	0.332	0.608+	2.908***
	(0.297)	(0.232)	(0.331)	(0.374)
R-squared	0.126	0.037	0.218	0.184

Note: N = 663 couples. Unstandardised regression coefficients are shown with standard errors in parentheses. The reference group for education is neither parent has formal education, the reference group for region is Bono, and the reference group for ethnicity is Mole-Dagbani.
*** *p*<.001, ** *p*<.01, * *p*<.05, + *p*<.10.

Appendix D

In Tables D.1 and D.2 we conduct a robustness check on the main results (Tables 3 and 4), where we exclude those 10% of cases (*n* = 67), where the primary caregiver changed from being the biological mother at endline.

Table D.1: Unstandardised regression coefficients for time use categories by education, excluding 67 observations

	Paid labour	Farm and family enterprise	Unpaid care	Sleep	Personal care and leisure
Panel A: Mothers' time use					
Neither have formal education	*Ref*	*Ref*	*Ref*	*Ref*	*Ref*
Mother only has formal education	-0.131	-0.075	0.149	-0.128	0.184
	(0.233)	(0.237)	(0.252)	(0.161)	(0.154)
Father only has formal education	-0.230	-0.431*	0.675**	-0.220	0.206
	(0.215)	(0.219)	(0.233)	(0.148)	(0.142)
Both have formal education	0.107	-0.270	0.513*	-0.386*	0.035
	(0.227)	(0.231)	(0.245)	(0.156)	(0.150)
Constant	0.780+	5.887***	5.829***	9.095***	2.408***
	(0.428)	(0.435)	(0.462)	(0.294)	(0.283)
Panel B: Fathers' time use					
Neither have formal education	*Ref*	*Ref*	*Ref*	*Ref*	*Ref*
Mother only has formal education	-0.033	-0.038	0.200	-0.154	-0.160
	(0.343)	(0.271)	(0.330)	(0.137)	(0.217)
Father only has formal education	0.457	-0.414+	0.493	-0.226+	-0.211
	(0.317)	(0.250)	(0.305)	(0.126)	(0.200)
Both have formal education	0.834*	-0.746**	0.596+	-0.315*	-0.362+
	(0.334)	(0.264)	(0.321)	(0.133)	(0.211)
Constant	1.376*	7.997***	2.244***	8.670***	4.245***

	(0.629)	(0.498)	(0.606)	(0.251)	(0.397)
Panel C: Couples' time use (mother–father difference)					
Neither have formal education	*Ref*			*Ref*	*Ref*
Mother only has formal education	-0.098	-0.037	-0.051	0.026	0.344
	(0.374)	(0.323)	(0.405)	(0.204)	(0.261)
Father only has formal education	-0.687*	-0.016	0.182	0.006	0.417+
	(0.345)	(0.298)	(0.374)	(0.189)	(0.241)
Both have formal education	-0.727*	0.476	-0.083	-0.071	0.398
	(0.364)	(0.314)	(0.394)	(0.199)	(0.254)
Constant	-0.596	-2.109***	3.585***	0.425	-1.837***
	(0.687)	(0.592)	(0.743)	(0.375)	(0.479)

Note: Unstandardised regression coefficients are shown with standard errors in parentheses. Unpaid labour is the sum of 'Child play and learning', 'Schooling activities', and 'Household tasks'. Control variables include parent age, number of children, household asset index, and age of youngest child. *** *p*<.001, ** *p*<.01, * *p*<.05, + *p*<.10. 10% of cases (n = 67), where the primary caregiver changed from being the biological mother at endline, are excluded from the analysis in this table.

Table D.2: Unstandardised regression coefficients for unpaid care time use categories by education, excluding 67 observations

	Child play and learning	Schooling activities	Caring for others in household	Household tasks
Panel A: Mothers' time use				
Neither have formal education	*Ref*	*Ref*	*Ref*	*Ref*
Mother only has formal education	0.174	0.017	0.111	-0.152
	(0.124)	(0.116)	(0.134)	(0.151)
Father only has formal education	0.015	0.181+	0.375**	0.104
	(0.115)	(0.107)	(0.123)	(0.140)
Both have formal education	0.240*	0.104	0.173	-0.004
	(0.121)	(0.113)	(0.130)	(0.147)
Constant	0.675**	0.352+	1.025***	3.777***
	(0.228)	(0.212)	(0.245)	(0.278)
Panel B: Fathers' time use				
Neither have formal education	*Ref*	*Ref*	*Ref*	*Ref*
Mother only has formal education	-0.035	0.150+	0.156	0.114
	(0.124)	(0.082)	(0.134)	(0.157)
Father only has formal education	0.071	-0.028	0.335**	0.017
	(0.114)	(0.076)	(0.124)	(0.145)
Both have formal education	0.087	0.080	0.436***	-0.014
	(0.120)	(0.080)	(0.130)	(0.152)
Constant	0.585*	0.053	0.306	0.768**
	(0.227)	(0.151)	(0.246)	(0.287)
Panel C: Couples' time use (mother–father difference)				
Neither have formal education	*Ref*	*Ref*	*Ref*	*Ref*
Mother only has formal education	0.210	-0.133	-0.046	-0.267
	(0.175)	(0.133)	(0.193)	(0.218)
Father only has formal education	-0.056	0.210+	0.040	0.087
	(0.161)	(0.122)	(0.178)	(0.202)
Both have formal education	0.153	0.024	-0.263	0.010
	(0.170)	(0.129)	(0.188)	(0.212)
Constant	0.090	0.299	0.719*	3.009***

	(0.321)	(0.243)	(0.354)	(0.401)

Note: Unstandardised regression coefficients are shown with standard errors in parentheses. Control variables include parent age, number of children, household asset index, and age of youngest child. *** p<.001, ** p<.01, * p<.05, + p<.10. 10% of cases (n = 67), where the primary caregiver changed from being the biological mother at endline, are excluded from the analysis in this table.

Appendix E

In Tables E.1 and E.2 we present our main results (Tables 2 and 3), with a different education classification. Instead of classifying mothers and fathers as having no and some formal education, we classify them as having no or (some) primary education and as having more than primary education.

Table E.1: Unstandardised regression coefficients for time use categories by education

	Paid labour	Farm and family enterprise	Unpaid care	Sleep	Personal care and leisure
			Panel A: Mothers' time use		
Neither have formal education	*Ref*	*Ref*	*Ref*	*Ref*	*Ref*
Mother only has formal education	0.041	-0.122	0.125	-0.152	0.108
	(0.241)	(0.246)	(0.257)	(0.161)	(0.158)
Father only has formal education	0.032	-0.084	0.402+	-0.354*	0.003
	(0.212)	(0.216)	(0.225)	(0.141)	(0.138)
Both have formal education	0.334	-0.532*	0.671**	-0.330*	-0.143
	(0.234)	(0.239)	(0.249)	(0.156)	(0.153)
Constant	0.514	5.719***	6.080***	9.080***	2.607***
	(0.386)	(0.394)	(0.411)	(0.257)	(0.252)
			Panel B: Fathers' time use		
Neither have formal education	*Ref*	*Ref*	*Ref*	*Ref*	*Ref*
Mother only has formal education	0.376	-0.317	0.567+	-0.300*	-0.352
	(0.352)	(0.281)	(0.342)	(0.144)	(0.223)
Father only has formal education	0.427	-0.202	0.170	-0.180	-0.043
	(0.309)	(0.247)	(0.300)	(0.126)	(0.195)
Both have formal education	0.878*	-0.581*	0.532	-0.195	-0.375+
	(0.342)	(0.273)	(0.333)	(0.140)	(0.216)

Constant	1.312*	7.624***	2.959***	8.555***	4.129***
	(0.564)	(0.450)	(0.548)	(0.231)	(0.356)
Panel C: Couples' time use (mother−father difference)					
Neither have formal education	*Ref*			*Ref*	*Ref*
Mother only has formal education	-0.335	0.196	-0.442	0.148	0.460+
	(0.389)	(0.332)	(0.413)	(0.210)	(0.266)
Father only has formal education	-0.395	0.118	0.233	-0.174	0.047
	(0.341)	(0.292)	(0.362)	(0.184)	(0.234)
Both have formal education	-0.543	0.049	0.139	-0.135	0.232
	(0.378)	(0.323)	(0.401)	(0.204)	(0.259)
Constant	-0.798	-1.905***	3.122***	0.525	-1.523***
	(0.622)	(0.532)	(0.660)	(0.336)	(0.427)

Note: Unstandardised regression coefficients are shown with standard errors in parentheses. Unpaid labour is the sum of 'Child play and learning', 'Schooling activities', 'Caring for others in household', and 'Household tasks'. Control variables include parent age, number of children, household asset index, and age of youngest child. *** *p*<.001, ** *p*<.01, * *p*<.05, + *p*<.10.

Table E.2: Unstandardised regression coefficients for unpaid care time use categories by education

	Child play and learning	Schooling activities	Caring for others in household	Household tasks
Panel A: Mothers' time use				
Neither have formal education	*Ref*	*Ref*	*Ref*	*Ref*
Mother only has formal education	0.205	0.094	0.089	-0.262+
	(0.128)	(0.118)	(0.137)	(0.157)
Father only has formal education	0.109	0.130	0.283*	-0.120
	(0.112)	(0.103)	(0.121)	(0.137)
Both have formal education	0.238+	0.205+	0.279*	-0.050
	(0.124)	(0.114)	(0.133)	(0.152)
Constant	0.805***	0.319+	1.057***	3.816***
	(0.204)	(0.188)	(0.220)	(0.263)
Panel B: Fathers' time use				
Neither have formal education	*Ref*	*Ref*	*Ref*	*Ref*
Mother only has formal education	0.102	0.128	0.250+	0.114
	(0.126)	(0.087)	(0.138)	(0.157)
Father only has formal education	0.152	-0.019	0.193	-0.328*
	(0.111)	(0.076)	(0.121)	(0.138)
Both have formal education	0.254*	-0.004	0.203	-0.179
	(0.122)	(0.084)	(0.134)	(0.153)
Constant	0.640**	0.061	0.627**	1.052***
	(0.202)	(0.139)	(0.221)	(0.251)
Panel C: Couples' time use (mother–father difference)				
Neither have formal education	*Ref*	*Ref*	*Ref*	*Ref*
Mother only has formal education	0.103	-0.034	-0.161	-0.376+
	(0.177)	(0.138)	(0.198)	(0.222)
Father only has formal education	-0.043	0.149	0.089	0.208
	(0.156)	(0.121)	(0.174)	(0.195)
Both have formal education	-0.016	0.209	0.076	0.128
	(0.172)	(0.134)	(0.192)	(0.216)
Constant	0.166	0.258	0.430	2.847***
	(0.284)	(0.221)	(0.316)	(0.356)

Note: Unstandardised regression coefficients are shown with standard errors in parentheses. Control variables include parent age, number of children, household asset index, and age of youngest child. *** *p*<.001, ** *p*<.01, * *p*<.05, + *p*<.10.

Thrive

Thrive is a multi-country research programme that aims to support countries to turn what we know about positive ECD into practical, scalable, low-cost programmes that are able to transform societies over multiple generations. Working closely with policymakers and other stakeholders, Thrive aims to build understanding of ECD service delivery models and how they can be provided cost effectively and at scale, and how these systems can innovate, improve, and better serve children and communities in LMICs.

Our five focus countries are Bangladesh, Ghana, Kiribati, Sierra Leone, and Tanzania.

The Thrive programme is funded by UK International Development from the UK government and by New Zealand's Ministry of Foreign Affairs and Trade (MFAT). It is managed by Oxford Policy Management, in collaboration with the Institute for Fiscal Studies.

Oxford Policy Management
Ground floor, 40–41 Park End Street, Oxford, OX1 1JD   T: +44 (0)1865 207 300
Registered in England 3122495
thrivechildevidence.org | @Thriveevidence