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Time use patterns and household adversities: A lens to understand the construction of gender privilege among children and adolescents in India

Kriti Vikram [a,*], Dibyasree Ganguly [b], Srinivas Goli [c]

[a] Department of Sociology and Anthropology, National University of Singapore, AS1 #04-15, 11 Arts Link, Singapore, 117570
[b] National Data Innovation Centre, National Council of Applied Economic Research, New Delhi, India
[c] International Institute for Population Sciences, Mumbai, India

A B S T R A C T

We investigate gender differences in time-use patterns in 1891 children and assess how time is reallocated in response to challenges faced by households in India. We use adaptations made within a household during adversities to understand how gender inequality in time use is produced and reinforced. Using three waves of the Young Lives Panel Survey (2009, 2013, and 2016), we find that boys spend significantly more time on school and leisure than girls. Girls spend more time on household chores, care work, and studying at home than boys while spending fewer hours on school and leisure. Girls perform paid work during household adversities besides carrying out additional care work and household chores. Boys are more likely to engage in unpaid work than girls but are similarly affected in other domains. However, their time for education and leisure is often protected. Thus, girls labor more than boys daily and respond in equal measure during adversities, demonstrating that gender inequality in time use emerges at an early age.

1. Introduction

Gender norms and expectations are instrumental in defining the status, opportunities, and constraints faced by youth in India. The disadvantaged position of girls has been documented across different spheres (Rammohan and Vu, 2018; Sundaram and Vanneman, 2008; Zimmermann, 2012), yet limited empirical evidence sheds light on how children undergo gender socialization in India. Gender socialization refers to the process through which individuals imbibe gender norms and expectations and develop a gender identity (Ryle, 2011). However, gender is not a static construct but one shaped by a range of factors operating at multiple levels (Connell, 1987; Ridgeway and Correll, 2004; Risman, 2018). These include hegemonic cultural beliefs and distribution of resources at the institutional level, behavior patterns at the interactional level, and identities at the individual level (Cunningham, 2001; Ridgeway and Correll, 2004; Ridgeway and Smith-Lovin, 1999; Risman, 2004). Risman (2004) contends that when gender is conceptualized as a social structure, it enables us to analyze the mechanisms through which gender gets "embedded at the individual, interactional, and institutional dimensions of our society" (Page. 446) (see Table 4).

This article examines child and adolescent time use patterns to assess how gender is socially constructed in India. How children use their time reflects parental socialization intentions and thus can provide insight into the gender ideologies of their families and communities. It can also be instrumental in revealing how gender norms and cultural expectations shape the gender roles and identities of children. Using a sample of 1891 children over the three waves of Young Lives Study (hereafter YLS) from 2009 to 2016, we study time spent across seven activities – care work, household chores, school, studying at home, unpaid economic work such as engagement

* Corresponding author.
E-mail addresses: socvk@nus.edu.sg (K. Vikram), dibyasreeganguly@gmail.com (D. Ganguly).

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in family farms and enterprise without personal payment for services but one that generates income for the household, paid work, and leisure and self-maintenance activities to provide a comprehensive overview of children's and adolescents' time use patterns. Furthermore, we examine an overlooked topic in Indian literature - how household adversities differentially shape the time-use patterns of boys and girls in India. We use adaptations made within a household during adversities, such as floods, health challenges within the family, agricultural and economic hardships, through reallocation of children's time in daily activities as a tool to gain a deeper understanding of how gender inequality in time use is produced and reinforced.

Gender performance is predicated upon social and cultural expectations of gender roles; however, relying primarily on the description of time-use patterns and their accordance with culturally prescribed gender roles offers a limited understanding of how gender roles become embedded. Adversities faced by the household can serve as "arenas" where "individuals define themselves in relation to others" to make sense of a situation and determine a course of action (Ridgeway and Correll, 2004, p. 115). In these arenas, cultural beliefs and rules about gender manifest and can function as a lens to investigate the value accorded to children based on their gender. Such exploration allows us to recognize conditions within the household that shape the gender identities of children and generate gender-based inequality.

We focus on children's transition from late childhood to adolescence. Children start to take on greater household and economic responsibilities during adolescence, particularly in economically vulnerable families (Burton, 2007; Das, 2022). Moreover, it is a time of intense gender socialization across varied social contexts (John et al., 2017; Kågesten et al., 2016). This article contributes to the scant literature on the social construction of gender in childhood in India and documents how gender inequality in time use patterns takes root early in life in the context of household adversity.

Allocation of time in everyday activities remains markedly gendered in India; men predominantly engage in paid work with minimal time spent on household chores and child care (Larson et al., 2001). On the other hand, women are more likely to be involved in domestic duties and care work, such as caring for the sick, children, and elderly (Narasimhan and Pandey, 1999; Raveendran, 2016). A recent nationwide time use study from India finds that female youth aged 15–29 allocate 7.4 h in a day to household chores and care work. In contrast, similarly aged male youth spend 2.8 h on these activities (NSO TUS-2019). More revealing are the statistics showing that 86% of female youth (aged 15–29) perform household chores daily compared to 24.2% of male youth (ibid). Similarly, for the same age group, 40% of female youth performed unpaid caregiving services for household members daily compared to 11.5% of male youth (ibid.).

Time use studies on Indian children document comparable patterns as girls spend more time on household chores and care work (Lloyd et al., 2008; Pells, 2011; Espinoza-Revello and Porter, 2018), whereas boys spend disproportionately more time on leisure (Lloyd et al., 2008) and on education (Motiram and Osberg, 2010; Singh and Krutikova, 2017). Such gendered patterns have also been noted more broadly across countries in South Asia, where adolescent girls spend double the amount of time in household-based activities than boys (United Nations Children's Fund, 2016). These time use patterns are but a reflection of the pervasive gender disadvantage experienced by girls across multiple domains – educational expenditure (Rammohan and Vu, 2018; Vikram, 2021), academic achievement (Das and Singhal, 2023), nutritional disparities (Aurino, 2017) and health (Ram et al., 2014; Krishna et al., 2019). Thus, time use can be viewed as another axis of discrimination in India.

However, the gender imbalance in hours spent on work is recognized globally (Hochschild, 1989). Evidence from the United States shows that employed mothers and wives perform the "first shift" at the workplace and a "second shift" of housework and childcare at home (ibid). This time bind, a consequence of multiple shifts at home and the workplace, results in women's deprivation of leisure and sleep (Hochschild, 1989, 1997). Limited research also documents the double burden of work borne by women in India. In rural areas, they spend time on various unpaid activities such as farm work, household chores, and childcare (Baliyan, 2017; Picchioni et al., 2020). In urban areas, sex segregation in household tasks does not change significantly even as more women enter the labor force (Lahiri-Dutt and Sil, 2014; Samantroy, 2015). Thus, Indian women also work significantly more hours than men when they engage in paid or unpaid economic activities (Baliyan, 2017; Picchioni et al., 2020). Thus, it is vital to understand how the proclivity to perform multiple shifts becomes engrained in women.

We start by presenting the context of gender privilege and family life in India, followed by a review of literature on gender socialization and time-use patterns of children and adolescents. The subsequent section discusses the evidence on household adversities' role in shaping children's outcomes and time use patterns. This is followed by data, methodology, and the results section. The article concludes with a discussion of the results.

2. Gender privilege and family life in India

Preference for sons is pervasive in India (Bharati et al., 2011), although with regional variations (Dyson and Moore, 1983). A confluence of factors - kinship norms, social norms, gender beliefs, and practices - has resulted in an unyielding gender hierarchy in India. In particular, patrilineal descent and patrilocal exogamy, the norm of relocation of the bride from the natal home to the groom's household after marriage, drive the cultural preference for sons and reduce investments in the health and well-being of their daughters (Das Gupta et al., 2003; Rammohan and Vu, 2018; Sundaram and Vanneman, 2008). A woman's position or "slot" within the household is deemed temporary at her natal home as she is expected to join her husband's family upon marriage (Das Gupta et al., 2003, p. 161). Dube (1986) elaborates on the Hindu ideology of perceiving men as the progenitors in patrilineal India, whereas women serve as receptacles or "earth" for his "seeds." Thus, men's role is considered instrumental in perpetuating the family line, whereas women's reproductive role is deemed secondary and transferable (Dube, 1988).

Given their transient status in their natal home and the secondary status in their marital home, girls are expected to embody values that make them beneficial to their household. Dube (1988) discusses the role of "*sewa*" as an integral component of gender

socialization in Indian families wherein girls are expected to be of service to others and develop qualities of self-restraint, tolerance, and self-denial (Page WS-17). Furthermore, she argues that girls are socialized to be "pliable" like mud, so they can be shaped in any fashion to suit the requirements of their marital homes (Page WS-18). These values achieve the dual purpose of preparing girls for life in their marital homes, where these qualities would help them adjust to a new life while also creating feminine qualities that are culturally desirable. Such belief guides the social arrangement within several families and is manifested in asymmetrical gender roles and time-use patterns.

Gender patterning in time use begins early in India as girls, particularly in rural areas, do more housework as they age, whereas boys largely remain exempt from it (Baliyan, 2017; Motiram and Osberg, 2010). Furthermore, girls are more likely to drop out of school than boys and engage in a range of activities both within and outside the household, such as domestic work, care for others, animal care, and agricultural work on family farms in rural India (Baliyan, 2017; Rustagi, 2009; Motiram and Osberg, 2010). On the other hand, the opportunity cost of boys' time plays a vital role in parental decisions regarding their children's time (Drèze and Kingdon, 2001; Motiram and Osberg, 2010). For instance, sons receive more educational resources than daughters (Rammohan and Vu, 2018). However, evidence also shows that boys are more likely than girls to be pulled into the labor force during economic duress (Dash et al., 2018; Das, 2022).

3. Gender socialization and time use

Children internalize gender norms and roles and learn to 'do' gender through gender-based socialization (Ryle, 2011; John et al., 2017). Although children start learning gender roles at an early age (O'Brien et al., 2000), it has been suggested that adolescence is a time when the process of gender socialization becomes more intense, and gender roles become more entrenched (Hilbrecht et al., 2008; Hill and Lynch, 1983; John et al., 2017; Kågesten et al., 2016). Societal and familial expectations regarding conformity to hegemonic gender roles and behaviors become exacerbated during early adolescence, likely with the onset of puberty (Hill and Lynch, 1983; Basu et al., 2017).

Families play a critical role in the gender socialization process (Kroska and Elman, 2009; McHale et al., 2003; Halpern and Perry-Jenkins, 2016). Parental modeling is a critical mechanism through which parents influence and socialize their children (Blair, 1992). An equal division of housework among American parents during early childhood was found to be associated with greater time spent on housework among adult sons (Cunningham, 2001). Mothers' time on paid work in early childhood was negatively associated with their adult daughters' time on housework (ibid). Correspondingly, evidence from Germany suggests that the mother's time on housework was positively associated with daughters' time on housework (Schulz, 2020). Observing adults perform gender roles can lead to gender role inferences among children, i.e., gender role beliefs and stereotypes that can generate internal pressure to conform to society's division of labor (Wood and Eagly, 2012).

Secondly, parents also influence the time use patterns of their children through their ideology. Cunningham (2001) found that gender-egalitarian attitudes of the mother during mid-adolescence were associated with greater time spent on housework among adult men in the US. Similarly, lower gender egalitarianism or son preference in parents was associated with more time spent on housework among Indian girls (Lin and Adserà, 2013; Gibby, 2022). Parents can function as active socialization agents, shaping their sons' and daughters' opportunities and behaviors in education, leisure, and housework (Ruble et al., 2006; Basu et al., 2017). For instance, the time for outdoor play was restricted to girls compared to boys in the UK, resulting in girls spending more time on sedentary tasks within the household (Atkin et al., 2013). In India, parents were found to directly influence their children's activities, such as cleaning the house and washing dishes for girls, while boys were coached to provide for and protect their families (Basu et al., 2017). Moreover, girls experienced more significant parental restrictions on outdoor activities and interactions with the opposite sex (ibid.).

These strictures align with gender role theory and expectations wherein females frequently internalize, undertake, and are valued for communal activities that entail warmth, nurturance, and caregiving, whereas males undertake agentic behavior displaying risk-taking, assertiveness, and aggression (Kay et al., 2007; Wood & Eagly, 2009, 2012). However, contextual factors are vital in shaping gender roles, expectations, and ideology. For instance, in societies characterized by greater gender inequality, women are more likely to endorse "benevolent sexism," defined as stereotypical beliefs regarding women's communal roles that support traditional gender roles (Glick and Fiske, 2001, pp. 109).

Hence, how time is structured for girls and boys is deeply intertwined with the process of gender socialization and normative gender beliefs. Thus, the following hypotheses are tested in the paper.

H1a. Girls shall allocate more time to household-based activities - domestic work, care work, and unpaid economic work such as agricultural work on family farms in India.

H1b. Boys shall spend more time in school and studying at home.

H1c. Boys will spend more time on paid activities than girls.

H1d. Given the privileged status of boys, they will have more time for leisure and self-maintenance.

4. Household adversities and time use

Adversity is "a state or instance of serious or continued difficulty or misfortune" (Merriam-Webster, n.d.). Within the context of child and adolescent development, it may be viewed as any circumstance associated with adverse outcomes for children. In this article, the term is used to encapsulate a range of situations at the household level that can negatively affect children's time use patterns and,

consequently, their well-being.

Households, particularly in low and middle-income countries (LMICs), are vulnerable to various health and economic adversities (Wagstaff, 2007; Dercon, 2002). These adversities can impact income, consumption, and availability of labor, among others (Guarcello et al., 2010; Bandara et al., 2015); these can, in turn, lead to significant changes in the lives of children within the household.

Evidence has linked households' response to economic shocks, events that lead to lower household income, such as job losses and natural disasters, to increased child labor (Beegle et al., 2006; Guarcello et al., 2008, 2010). Results from Tanzania and Nigeria show that agricultural shocks increase overall working hours and agricultural activities for both boys and girls; however, the effect is more pronounced for boys (Bandara et al., 2015; Huang and Acheampong, 2018). Conversely, girls are more likely to withdraw from school (Bandara et al., 2015). These strategies enable the household to cope with adversities by minimizing expenses and increasing income through additional labor.

A few studies have also examined parental illness's effect on children's time use patterns. Using the YLS dataset in Ethiopia, Dinku et al. (2018) found that fathers' sickness increased sons' time on income-generating activities. In contrast, mothers' sickness increased domestic work, more so for daughters than for sons (ibid.). In Vietnam, maternal illness increases the likelihood of entering the labor market and working more hours among children, leading to decreased school enrolment (Mendolia et al., 2019). However, daughters were more disadvantaged than sons (ibid.). Father's illness adversely influences children's likelihood of completing primary school, irrespective of gender, and leads to fewer years of schooling but does not result in increased child labor among children aged 7 to 15 in Tanzania (Alam, 2015). Dhanaraj (2016) finds that mothers' illnesses led to more time spent on domestic chores and other unpaid activities during childhood in India. On the other hand, fathers' illness increased children's time on unpaid activities and reduced time spent studying in middle adolescence (ibid.). However, Dhanaraj (2016) did not disaggregate the results by gender or control for unobserved heterogeneity using panel-fixed effects.

According to the 2011 Census, the number of child laborers in India was estimated to be 10.1 million, of which 5.6 million were boys and 4.5 million were girls. Studies find that lower education among parents, large family size, household poverty, residence in rural areas, and belonging to socially and economically disadvantaged caste and religious groups were associated with children being in the labor force (Dash et al., 2018; Das, 2022). Thus, the economic and social vulnerability of the household is known to push children into labor in India.

Evidence has linked socioeconomic adversities with detrimental effects on children's education and increased child labor in India and other LMICs. However, we must understand how they influence other dimensions of child well-being, such as leisure and self-maintenance, unpaid work, and care work. Particularly in the context of India, with entrenched gender hierarchies and associated socialization patterns, how household adversities shape boys' and girls' time-use patterns remains unexplored.

Evidence documents gendered patterns in men and women's use of time in India, with women spending a significant amount of time on household chores, caregiving work, and unpaid economic work for the household, and men engaging predominantly in paid work (Larson et al., 2001; Narasimhan and Pandey, 1999; Raveendran, 2016; NSO TUS-2019). Given that modeling and emulation are potent agents of socialization (Cunningham, 2001; Tobin et al., 2010; Schulz, 2020), we expect children to reflect similar patterns in their actions. Gender-based socialization in childhood, as suggested through activities in childhood, shapes gender ideology and personality in adulthood (Davis and Risman, 2015). Research also highlights the influential role of cognitive schemas in defining the behavior of children in accordance with their identified gender (Bem, 1993). According to the gender-schema theory, "enculturation," i.e., the assimilation of cultural gender norms, leads to the development of a cognitive framework that results in decisions and behaviors considered gender appropriate by the child (ibid., pp. 139). This results in the development of gendered self-concept and "sex-typed" behavior in children (ibid, pp 604–05).

Research in India shows that parents actively engaged in sex-differentiated practices, such as giving boys greater freedom and mobility, preparing them to be the protectors and providers for their families (Ram et al., 2014; Basu et al., 2017). On the other hand, girls were encouraged to learn household chores at an early age and experience restrictions in movement and education (ibid). Research across LMICs highlights how even young girls' demeanor, speech, and appearance can be highly regulated (Kågesten et al., 2016; Basu et al., 2017).

In the event of adversities, we expect that gender norms, cultural mores, and gender-based socialization would determine how girls and boys would respond to adversities due to internalized gender roles, gender schemas, and cultural expectations. However, gender identity and behavior are created through a confluence of cultural, social, biological, and cognitive forces that interact to produce gender-differentiated behavior and identity (Wood and Eagly, 2012). Thus, children's actions may be altered in the event of extreme crises, when the sustenance of the household may be at stake, such as due to the breadwinner's death or significant loss of assets. Girls' engagement in paid work outside of the home may also be viewed as an extension of their communal role, i.e., to provide for the needs of their families during crises.

Based on son preference and gender socialization patterns in India, we test the following hypotheses.

H2a. Adversities shall lead to increased time on household-based activities like care work, domestic chores, and unpaid economic activities for girls.

H2b. Adversities shall lead to increased time on paid activities for boys, given their expected gender roles.

H3a. Given the disadvantaged status of girls, their time on education, leisure, and self-maintenance will be reduced in the event of adversities.

H3b. Given the privileged status of boys, their time on education, leisure, and self-maintenance will be protected in the event of adversities.

5. Methods

5.1. Data

We use the YLS, a longitudinal panel survey of 2000 children in India with an explicit aim of understanding the consequences of childhood adversity over time (Singh et al., 2018). The data is publicly available and can be obtained upon registration from the UK Data Service. The survey was carried out in the states of Andhra Pradesh and Telangana. The survey utilized a semi-purposive sampling strategy. First, districts across the two states were ranked according to economic and human development, and then a representative group of poor and non-poor districts was selected from these rankings. The sample was randomly collected from twenty sentinel sites across the sampled districts with an overrepresentation of low-income families. The sentinel site methodology is beneficial in establishing a stronger relationship between the survey team and the respondents over extended periods (Nguyen, 2008), which helps improve follow-up and reduce attrition. The purpose of the survey was not to provide nationally representative data but rather to provide rich longitudinal data that tracks children over 20 years to identify how early-life circumstances shape outcomes of young adults and identify those factors most relevant for their well-being and development (Young Lives, 2017).

The survey followed two cohorts of children: a younger cohort comprising 2000 children between the ages of 0.5 and 1.5 years and an older cohort consisting of 1000 children between the ages of 7.5 and 8.5 years in 2002. A single child was selected per household, and for those households with children eligible for both cohorts, only the younger child was included in the survey.

Two sets of questionnaires were administered face-to-face in every survey round: a household questionnaire typically answered by the child's primary caregiver and a child questionnaire answered by the sampled child (Briones, 2018, p. 7). The survey included questions about hours spent on a list of eight predefined activities on a typical weekday (Briones, 2018). Besides the time use patterns of children, the survey collected a wide range of information about the child, their caregivers, and the household. After excluding 120 cases from the 2011 children in the original cohort due to attrition and child death, the analytical sample for the analysis includes 1891 children belonging to the younger cohort between the ages of 8 in 2009 and 15 years in 2016 from the last three rounds (2009, 2013, and 2016) of the survey. Girls make up 46.2% of the sample. The attrition rate was low in the younger cohort, and YLS could re-interview 96% of the original children.

We exclude the first wave because data on time use is unavailable for the first round. Although time use data is available in the second round, we do not include it in the analysis as the mean age of children was five years in this wave (Singh et al., 2018). Children at this stage of their life course, during early childhood, may devote limited time to performing household chores, care work, paid work, and unpaid economic activities. Moreover, data on some of the adversities were not collected in round 2. The inclusion of the last three rounds of the survey allows us to assess gendered patterns in time use from late childhood to mid-adolescence, a period of intense gender socialization, wherein boys and girls experience increasing familial and societal pressure to conform to culturally sanctioned hegemonic gender roles (Hill and Lynch, 1983; Basu et al., 2017).

5.2. Dependent variables

The survey collected information on the time use patterns of children on a typical weekday. The child was asked, "I want to know how many hours did you (the child) spend on the following activities during a typical day (Monday to Friday) in the last week." If the child was ill on the day of the interview, he or she was asked to consider a typical day before the illness. For the third wave (2009), when the child was about eight years of age, the primary caregiver answered these questions. The child answered these questions in rounds four and five. There were twelve missing values (0.21%) on time use across all outcomes in our study sample.

This paper includes seven activities that provide a comprehensive overview of a typical day in the lives of children.

- Hours spent in school: the amount of time a child spends at school, including travel time.
- Hours spent studying: the time spent studying at home and attending academic classes or tutorials outside of school time.
- Hours spent on unpaid economic work: the time spent on tasks on the family farm, handling livestock, or other family businesses that generate income for the household.
- Hours spent on paid work: the amount of time spent doing remunerated work or activities outside the household or for someone not in the household. This measure includes commuting time (Briones, 2018).
- Hours spent on domestic tasks: The amount of time spent on household tasks such as fetching water and firewood, cleaning, cooking, washing, and shopping.
- Hours spent on care work: The amount of time spent caring for others in the household, such as younger siblings and sick household members.
- Leisure and self-maintenance: The amount of time spent on playing, leisure, and self-maintenance activities such as eating and bathing (Briones, 2018).

The dependent variables are continuous and represent the number of hours in a day spent on these activities. The exact questions in the survey are included in the supplementary file (Table S2).

5.3. Independent variables

The primary independent variable was the child's sex. This information was sought from the household roster. It was also included

in the child's questionnaire in rounds four and five.

We also assessed how adversities experienced by the household influence the time-use patterns of children. The child's primary caregiver was asked whether the household had experienced important events and changes that negatively affected the household economy since the last survey (Table S2 in the supplementary document includes the survey questions). The responses on household adversities were not actual occurrences of adverse events but rather the respondent's assessment of the effects ensuing from these events that negatively impacted the household's welfare (Briones, 2018).

YLS provided information on a range of adverse events, which were coded as dichotomous variables. We included whether the household experienced health adversities, which included the father's death, the father's illness, and the mother's illness. We also included climatic and agricultural adversities, namely droughts, floods, pests on crops, and death of or pests on livestock. We have also included two measures of economic adversity: theft or destruction of cash, crops, livestock, housing, and increased input prices. These were modeled independently from others as they may overlap with other adversities that could destroy property, such as floods and pests on crops and livestock. There were no missing values on these variables. Although the YLS has several variables that measured shocks to the household, we only included those variables where about 2% of the households experienced adversity. The number of observations under 2% was small and would not allow for a meaningful statistical analysis.

We exclude a handful of adversities where the prevalence was over 2% and explain the rationale for their exclusion here. For loss of job or family income and increase in food prices, the prevalence was over 2%. However, they were not significantly associated with any outcomes and thus were excluded from the analysis. Only one outcome was significant for a decrease in output prices and crop failure and did not provide insight into gendered time use allocation. Specifically, decreased output prices were associated with increased time spent studying for boys. Crop failure increased boys' leisure, presumably because of less work on the family farm. Death or illness[1] of other family members were excluded as we included parental death and illness, which we believe to be the most theoretically meaningful for children's well-being. Hence, these variables were not included in the final analysis. No missing values were reported for any adversities in our study sample.

5.4. Control variables

The analyses include several relevant socioeconomic and demographic factors as control variables (Table 1). All variables except the child's enrolment status were sought from the primary caregiver. Child-specific variables included the child's age in years, highest educational level, school enrolment status, place (rural/urban), and region of residence. Education was measured using four categories to represent the highest grade completed by the child at the time of the interview: no education, primary education (grades 1–5), middle school (grades 6–8), secondary, and more (grades nine and above). Current school enrollment status was measured as a dichotomous variable.

The household's socioeconomic status was measured using mothers' and fathers' education and household wealth index. The parental education levels were categorized using the same categories used for children: no education, primary education (grades 1–5), middle school (grades 6–8), secondary, and more (grades nine and above). The wealth index was a composite measure constructed using three indices: housing quality (condition of the roof, floor, wall, and the number of rooms per person), access to services (source of drinking water, sanitation type, type of cooking fuel used, and availability of electricity), and ownership of consumer durables. An average of these three indices have been used to compute the index that produces a value between 0 and 1. A higher value on the wealth index indicates better socioeconomic status (see Briones, 2017, for more information on these variables). The wealth index has been widely used to measure households' living standards in resource-poor settings (ICF International, 1997-2014; Filmer and Pritchett, 2001). We include the number of adults in the household and whether the mother lived in the household, which was coded as a dichotomous variable. Religion was classified into three categories representing the region's religious diversity: Hindus, Muslims, and Others. Caste was categorized as Scheduled Castes (SCs), Scheduled Tribes (STs), Other Backward Classes (OBC), and other caste groups as the general category.[2] The caste stratification system has tended to dominate Indian society, with a large percentage of Muslims, Christians, and Sikhs identifying themselves within the caste hierarchy of the Hindu tradition. The two groups lowest in the social hierarchy are SCs and STs. The SCs have historically faced deprivation and oppression because of their low status in the caste system. The STs are composed of several tribal groups across India and have been socially, economically, and geographically marginalized. The OBCs are other backward classes that do not classify as SCs or STs but have historically been socially and economically disadvantaged.

6. Empirical strategy

The study uses random and fixed-effect regression models to analyze longitudinal data. Utilizing panel data allows us to control for unobservable variables. In the first set of analyses, we examine the effects of gender on the time use patterns of boys and girls using random effect models. We use random-effect models because our primary variable of interest is gender, a time-invariant characteristic. Along with gender, we include the aforementioned control variables to carry out random-effect models to estimate the effect of gender on time use.

[1] Data on the illness of other family members was not collected for round 3, which is another reason this variable was excluded from the analysis.

[2] 'Scheduled Castes' and 'Scheduled Tribes' are referred to as such because a list of the castes and groups was drawn and enumerated in two separate schedules of the Constitution of India.

Table 1
Descriptive statistics, young lives survey (YLS), N = 5673.

	Mean/Proportion					
Variables	2009	n	2013	n	2016	n
Hours spent in care work	0.212	1891	0.136	1886	0.176	1884
Hours spent in household chores	0.335	1891	0.860	1886	1.188	1884
Hours spent in unpaid economic work	0.015	1891	0.148	1886	0.337	1884
Hours spent in paid work	0.008	1891	0.060	1886	0.487	1884
Hours spent in schooling	7.678	1891	7.995	1886	7.833	1884
Hours spent in studying	1.833	1891	1.915	1886	2.115	1884
Hours spent in leisure and self-maintenance	4.772	1891	3.923	1886	3.575	1884
Sex of the child: Boy	0.538	1018	0.538	1018	0.538	1018
Health adversities:						
Father's death	0.017	33	0.020	37	0.017	32
Father's illness	0.071	134	0.086	163	0.103	195
Mother's illness	0.071	135	0.098	185	0.114	215
Climatic and agricultural adversities:						
Drought	0.071	134	0.103	194	0.171	323
Flood	0.026	49	0.054	102	0.021	40
Pests on crops	0.082	155	0.038	72	0.087	165
Death of or pests on livestock	0.077	146	0.078	147	0.067	126
Economic adversities:						
Increase in input prices	0.098	185	0.035	67	0.069	131
Theft/destruction (cash, crops, livestock, housing)	0.043	81	0.019	36	0.014	27
Child's age	7.952	1891	11.984	1886	15.000	1890
Adults in the household (range 0–21)	2.864	1891	2.611	1891	2.787	1891
Child's education: None	0.157	296	0.008	15	0.002	3
Grade 1-5	0.838	1585	0.444	840	0.021	40
Grade 6-8	0.000	0	0.546	1033	0.416	786
Grade 9 and above	0.000	0	0.002	3	0.520	984
Currently not enrolled in school	0.064	121	0.036	68	0.121	228
Mother lives in the household	0.964	1822	0.941	1779	0.930	1758
Mother's education: None	0.448	848	0.443	837	0.437	827
Grade 1-5	0.228	431	0.226	427	0.213	403
Grade 6-8	0.112	212	0.111	209	0.104	197
Grade 9 and above	0.197	373	0.197	373	0.212	401
Father's education: None	0.274	518	0.263	498	0.255	483
Grade 1-5	0.242	458	0.240	453	0.221	417
Grade 6-8	0.112	212	0.111	209	0.104	197
Grade 9 and above	0.336	636	0.329	623	0.338	639
Religion: Hindu	0.877	1658	0.877	1658	0.877	1658
Muslim	0.068	129	0.068	129	0.068	129
Others	0.055	104	0.055	104	0.055	104
Caste: SC	0.184	348	0.184	348	0.184	348
ST	0.149	281	0.149	281	0.149	281
OBC	0.465	879	0.465	879	0.465	879
General	0.203	383	0.203	383	0.203	383
Wealth quintile: Poorest	0.236	446	0.125	236	0.078	147
Poorer	0.253	477	0.169	319	0.130	245
Middle	0.200	377	0.271	513	0.185	350
Richer	0.182	344	0.203	383	0.289	547
Richest	0.130	245	0.233	440	0.318	602
Residence: Rural	0.744	1406	0.719	1359	0.700	1324

SC= Scheduled Caste; ST= Scheduled Tribe; OBC= Other Backward Class.

The mathematical specification for the random effects model is as follows:

$$\boldsymbol{Y_{it} = \beta_0 + \beta_1 Gender_{it} + \beta_2 X_{it} + (\alpha_{it} + u_{it})}$$

Where the subscripts *i* and *t* represent the individual and time, i.e., survey rounds (2009, 2013, and 2016), respectively. Y_{it} represents the dependent variables, i.e., the number of hours spent in varied activities. β_0 is the intercept for each child. β_1 is the coefficient for gender. Other independent variables pertaining to individual, parental, and household characteristics, as well as survey year and regions, are represented by X_{it}. α_{it} and u_{it} together is defined as the composite error term.

In the second step, we use fixed effects regression models to estimate the effect of adversities health, climatic, and agricultural adversities in one model and economic adversities in the second model on the time use patterns of girls and boys separately. Random-effects regression analyses do not control for individual or household-level unobserved heterogeneity, which may confound the effects of household adversities on children's time use. Fixed effects estimation allows us to control for unobserved heterogeneity and omitted variable bias. Furthermore, the time-invariant characteristics from the regressions are eliminated in fixed effects estimations.

The fixed effects model is specified as follows:

$$Y_{it} = \beta_0 + \sum_i \beta_{1,} \textit{Household Adversities}_{it} + \beta_2 X_{it} + \delta_i + \gamma_t + \epsilon_{it}$$

where subscripts I and t represent the individual and survey rounds (time), respectively. Y_{it} denotes the dependent variable. *Household Adversities* represent dummy variables for the two sets of adversities – health, climatic, and agricultural adversities, along with economic adversities– which are analyzed separately, and their coefficient, $\beta_{1,}$ is our central coefficient of interest. γ_t depicts survey round fixed effects; δ_i denotes the individual fixed effects that varies for each individual and $\varepsilon_{i,t}$ is the individual error term.

We run models separately for each gender to assess how household adversities influence boys or girls. If the coefficients for a particular adversity are statistically significant in the fixed effects models for both boys and girls, we run a random effects model with an interaction term between child sex and that adversity to ascertain in what direction and by what magnitude the impact of adversity varies by gender.

7. Results

7.1. Descriptive statistics

We begin with a discussion of the descriptive statistics from the three waves of the survey. Table 1 shows that the average number of hours spent on household chores, unpaid economic work, paid work, and study at home increased as the cohort of children grew older. In contrast, hours spent on care work, leisure, and self-maintenance decreased with age. The number of respondents not enrolled in school increased over time, suggesting a propensity to drop out after completing the secondary level of education. Evidence shows that girls were more likely to be pulled out of school during early to middle adolescence, mainly due to engagement in household chores (Singh et al., 2018). At the same time, boys drop out to provide financial support to the household (ibid).

The time use patterns of boys and girls across the three waves of the survey are presented in Figs. 1 and 2. There are significant gender differences between boys and girls across several domains. Girls were more likely to spend time on household chores, perform care work, and study at home, whereas boys spent more time in school and leisure-based activities (including self-maintenance). Striking trends were observed as this cohort of children went through adolescence. In particular, the amount of time girls spent on household chores increased noticeably from 29 min in 2009 to 1.4 h in 2016; housework also increased for boys, from about 15 min in 2009 to 1 h in 2016. Care work reduced slightly for boys from 11 min in 2009 to 7 min in 2016. Girls provided 15 min of care in 2009 and 2016. In the third wave (2016), time spent on paid work and unpaid economic activities increased for both genders. Boys spent slightly more time on these activities, but the gender gap was not statistically significant. Fig. 2 shows that boys spent more time in school than girls, although the gender gap was small. This pattern remained consistent across the three waves. Boys enjoyed an advantage across all the waves in leisure and self-maintenance activities, but time spent on leisure and self-maintenance diminished for all as children grew older.

We then assessed the influence of gender on time use patterns after accounting for the control variables (Table 2). The gender hierarchy was maintained as girls spent less time in school (ß $= -0.325$, $p < 0.001$) and on leisure and self-maintenance (ß $= -0.203$, $p < 0.001$), by about 19.5 and 12.2 min, respectively. Girls spent about seven additional minutes on care work (ß $= -0.114$, $p < 0.001$) and 19.4 more minutes on housework (β $= 0.323$, $p < 0.001$). Surprisingly, gender was not significantly associated with remunerative activities outside of the household and other unpaid economic tasks within the household. Hence, we find partial support for H1a as girls allocate more time to household-based activities, namely care work, and domestic chores, but not unpaid work. Although boys spent 19.5 more minutes time in school, girls spent more time studying at home (β $= 0.084$, $p < 0.01$), about five more minutes than boys, thus providing partial support to H1b as boys were expected to spend more time in school and studying at home. We find no support for H1c as no significant relationship was observed between paid work and gender and it was expected that boys will be more likely to engage in paid work. Lastly, support was found for H1d, as boys had greater access to leisure and self-maintenance than girls (see Table 3).

Among the control variables, age is positively associated with household chores (β $= 0.104$, $p < 0.01$) and paid work (β $= 0.218$, $p < 0.001$) but negatively associated with time in school (ß $= -0.463$, $p < 0.01$) and time spent studying (ß $= -0.181$, $p < 0.001$). A one-year increase in age was associated with an additional 6 min on household chores and 13 min on paid work. It was also associated with 28 fewer minutes in school and 11 fewer minutes of studying at home. These patterns suggest that as children transition to adulthood in the sample, they spend more time in adult roles, i.e., greater economic activities and household chores, and reduced time on education. Research shows that children, primarily from low-income families, are more likely to drop out of school at the secondary level in India (Malik, 2013). Our results also show that children spend less time in school and studying at home as they grow older.

Being enrolled in schools and having higher levels of education among children were associated with more time on educational activities and less time on paid and unpaid work. Higher levels of education among fathers and mothers were associated with additional time in school and on study and reduced time on leisure. Higher education among fathers was also associated with less time on household chores and unpaid economic work. Mother's presence in the home was associated with reduced time in household chores and increased time in school. Higher socioeconomic status was associated with more time spent on educational activities and reduced time on leisure.

7.2. Household adversities and time use of children

Next, we examine how household adversities influenced the time use patterns of boys and girls. We stratified the sample by gender for this analysis and carried out fixed effects analyses by including climate, agricultural, and health adversities in one model and

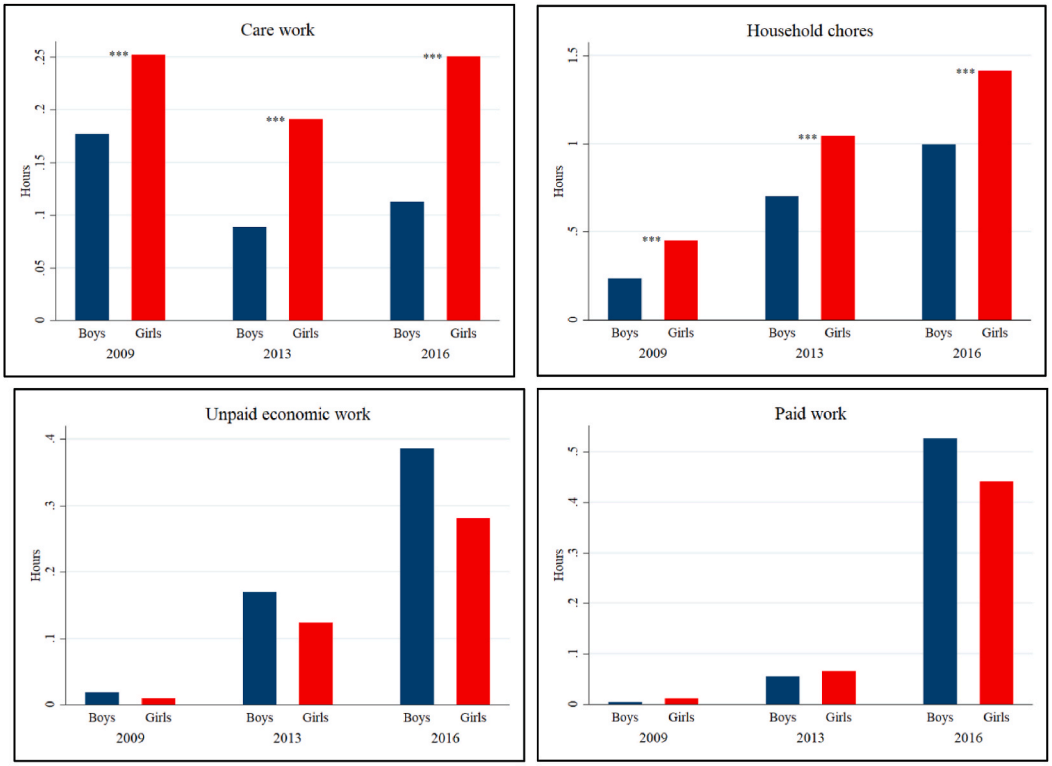


Fig. 1. Hours spent in care work, household chores, unpaid economic work, and paid work by gender across three waves of the Young Lives Study India
***p < 0.001, **p < 0.01, *p < 0.05.

economic adversities in the second model. Research shows that adversities faced by the household can result in children dropping out of school (Chudgar et al., 2019), which can significantly affect their time use patterns. However, dropping out of school is one of several ways through which households strategize to cope with adversities. In our analyses (Tables S3–S4 in the supplementary document), droughts reduced the likelihood of dropouts for boys. No association was observed for any of the other adversities.

Nonetheless, dropping out of school can result in time being spent on other activities, such as additional household chores or paid work. In order to document a more comprehensive description of how these adversities influence the time use patterns of girls and boys, we account for school enrollment status in all our analyses except for the analysis on time spent in school. This enables us to isolate the role of adversities over and above the effect of dropping out from schools on time use patterns.

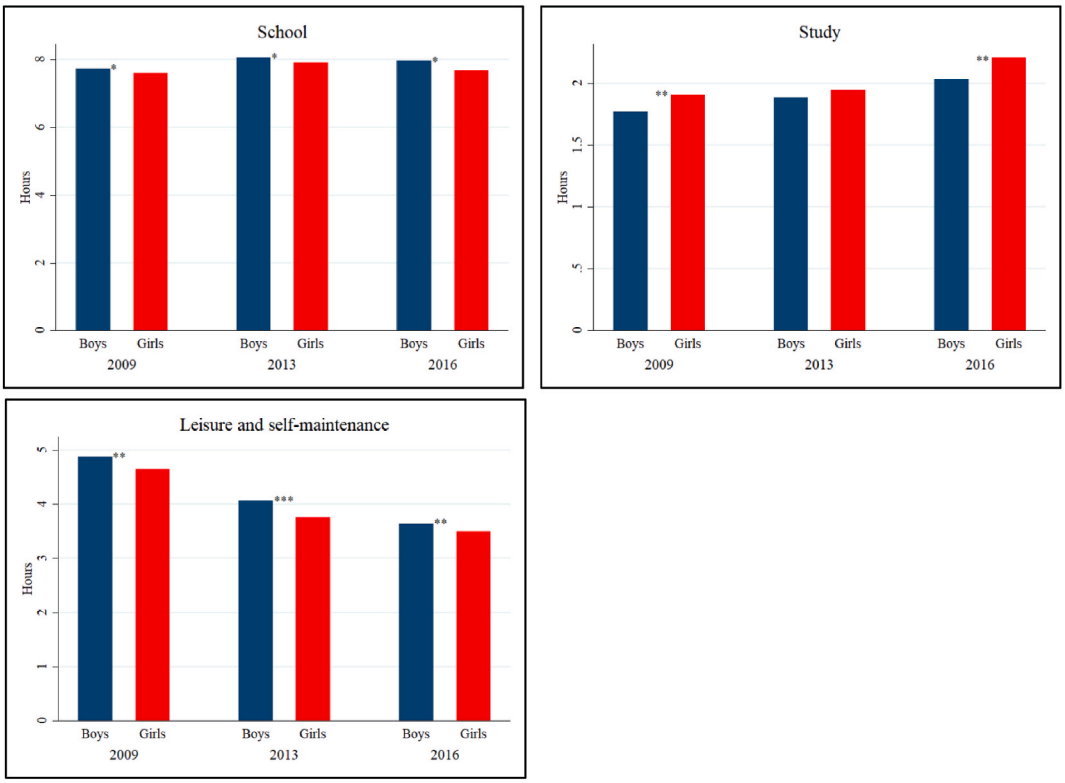
7.2.1. Health, climatic, and agricultural adversities

We start by discussing the effects of health adversities. For girls, the father's death increased the amount of time spent on care work by about 13 min ($\beta = 0.215$, $p < 0.05$) and paid work by about 24 min per day ($\beta = 0.398$, $p < 0.05$). Furthermore, it was associated with a decline in school time by 49 min for girls ($ß = -0.813$, $p < 0.05$), likely due to increased time spent on other activities. Hence, girls appear to be working more both within and outside the household, resulting in reduced time for education. The father's death did not influence the boys' time, although the father's illness reduced their time in school by 18.4 min daily ($ß = -0.307$, $p < 0.05$), but they spent 12 additional minutes studying at home ($\beta = 0.194$, $p < 0.05$).

Mother's sickness was associated with 14 fewer minutes spent on unpaid economic tasks for girls per day ($ß = -0.226$, $p < 0.01$), suggesting that girls reduce unpaid labor while their mothers recuperate. However, what they spent this time on was not apparent, as no observable effects were seen for other activities. Boys spent 11 additional minutes on paid work when their mothers were sick ($\beta = 0.178$, $p < 0.05$).

Next, we assessed the role of climatic adversities – droughts and floods on children's time use. Droughts increased the time spent on care work for girls by 8 min ($\beta = 0.130$, $p < 0.01$) and by about 4 min for boys ($\beta = 0.065$, $p < 0.05$).[3] Floods increased care work by 8

[3] The interaction results between a child's gender and droughts from random effects models support this conclusion, as child sex (girl) and the interaction term between sex and droughts were significant predictors of care work, suggesting that girls perform more care work than boys. The results are provided in the supplementary file (Table S5).



*** p<0.001, ** p<0.01, * p<0.05.

Fig. 2. Hours spent in school, study, and leisure and self-maintenance by gender across three waves of the Young Lives Study India
***p < 0.001, **p < 0.01, *p < 0.05.

min (0.139, p < 0.01) and household chores by 18 min (β = 0.299, p < 0.001) for boys. Boys' time on leisure was reduced by 24 min (ß = −0.393, p < 0.05) during floods, whereas girls' time on household chores increased by 19 min (0.310, p < 0.01).[4]

Pests on crops were associated with decreased time spent on paid activities for boys by 12 min (ß = −0.199, p < 0.05). For girls, pests on crops were associated with 20 fewer minutes of leisure (ß = −0.337, p < 0.05). On the other hand, the death of livestock or having pests on livestock was associated with increased time on unpaid economic activities for boys by about 12 min per day (β = 0.197, p < 0.05). It is plausible that boys take infected livestock to the veterinarian or administer treatment, which girls may be unable to undertake as no significant results are observed for girls. The death of livestock may also increase boys' work on the family farm.

Not being enrolled in schools was associated with 19 additional minutes spent on care work for girls (β = 0.320, p < 0.001). It also increased their time spent on household chores by 56 min daily (β = 0.939, p < 0.001). Out-of-school boys also contributed to household chores by about 18 more minutes per day (β = 0.296, p < 0.001), but the magnitude of the effect size was considerably larger for girls.[5] Both boys and girls who were out of school engaged in unpaid and paid work, and the effect size was similar for the two groups.[6] Boys spent about 78 additional minutes (β = 1.295, p < 0.001) on unpaid economic work and 131 additional minutes (β = 2.187, p < 0.001) on paid economic work. Girls who were out of school spent 71 additional minutes (β = 1.184, p < 0.001) on unpaid economic work and 132.5 additional minutes (β = 2.208, p < 0.001) on paid work. As expected, these children spent significantly less time studying at home but had greater access to leisure and self-maintenance time, girls more than boys.[5]

[4] In Model 1 from random effects models, floods were positively associated with household chores, but no results were observed in the interaction model (Table S5). These results suggest that the difference between the sexes is not statistically significant.

[5] The interaction results between a child's gender and not being enrolled in school from random effects models support the conclusion as child sex and the interaction term between gender and enrollment were significant predictors of care work, household chores, and leisure-based activities, suggesting that out of school girls spent more time on these activities. The results are provided in the supplementary file (Table S6).

[6] The interaction results between the child's gender (girl) and being out-of-school from random effects models support this conclusion, as both the child's sex and the interaction term were not significant predictors of paid and unpaid work. However, not being enrolled in school was positively associated with paid and unpaid work. The results are provided in the supplementary file (Table S6).

Table 2
Gender and time use patterns: Random effects estimates.

Variables	Care work	Household chores	Unpaid economic work	Paid work	School	Study	Leisure and self-maintenance
Gender: Girl	0.114***	0.323***	−0.032	−0.002	−0.325***	0.084*	−0.203***
(Ref: Boy)	(0.015)	(0.021)	(0.028)	(0.030)	(0.057)	(0.034)	(0.046)
Child's age	−0.004	0.104**	0.029	0.218***	−0.463***	−0.181***	0.047
	(0.024)	(0.033)	(0.044)	(0.047)	(0.089)	(0.053)	(0.072)
Adults in the	0.010	−0.011	0.021*	−0.009	−0.003	−0.005	0.004
household	(0.005)	(0.008)	(0.010)	(0.011)	(0.020)	(0.012)	(0.016)
Child's education: Grade 1-5	−0.024	−0.001	0.057	0.244***	1.451***	0.014	0.254**
(Ref: No education)	(0.030)	(0.044)	(0.055)	(0.065)	(0.105)	(0.067)	(0.096)
Grade 6-8	−0.012	−0.017	−0.181**	0.011	2.766***	0.173*	−0.103
	(0.037)	(0.053)	(0.067)	(0.079)	(0.127)	(0.082)	(0.117)
Grade 9 and above	−0.055	−0.092	−0.404***	−0.235*	4.112***	0.527***	−0.294*
	(0.045)	(0.064)	(0.082)	(0.094)	(0.152)	(0.099)	(0.140)
Currently not	0.242***	0.664***	1.378***	2.253***		−1.232***	1.631***
enrolled in school	(0.030)	(0.044)	(0.055)	(0.064)		(0.067)	(0.095)
Mother lives in the	−0.044	−0.163***	0.024	0.033	0.593***	−0.109	−0.055
household	(0.032)	(0.045)	(0.058)	(0.065)	(0.118)	(0.070)	(0.098)
Mother's education: Grade 1-5	−0.032	0.020	−0.062	−0.047	0.195*	0.083	−0.047
(Ref: No education)	(0.020)	(0.029)	(0.038)	(0.040)	(0.076)	(0.046)	(0.062)
Grade 6-8	−0.044	−0.060	−0.004	−0.089	0.236*	0.179**	0.026
	(0.027)	(0.039)	(0.051)	(0.055)	(0.103)	(0.062)	(0.084)
Grade 9 and above	−0.029	−0.056	0.012	−0.034	0.259**	0.267***	−0.205**
	(0.026)	(0.036)	(0.048)	(0.052)	(0.097)	(0.058)	(0.079)
Father's education: Grade 1-5	−0.006	−0.002	−0.104**	0.047	0.150	0.054	−0.115
(Ref: No education)	(0.021)	(0.029)	(0.038)	(0.041)	(0.077)	(0.046)	(0.063)
Grade 6-8	−0.040	0.035	−0.145**	0.023	0.103	0.173**	−0.140
	(0.027)	(0.038)	(0.050)	(0.054)	(0.101)	(0.061)	(0.082)
Grade 9 and above	−0.024	−0.093**	−0.130**	−0.028	0.321***	0.238***	−0.157*
	(0.022)	(0.032)	(0.042)	(0.045)	(0.084)	(0.051)	(0.069)
Religion: Muslim	0.109**	0.071	−0.105	0.070	−0.289*	−0.088	0.046
(Ref: Hindu)	(0.034)	(0.048)	(0.063)	(0.067)	(0.127)	(0.076)	(0.103)
others	0.017	0.036	−0.012	0.092	0.020	−0.050	−0.084
	(0.033)	(0.047)	(0.062)	(0.066)	(0.125)	(0.075)	(0.101)
Caste: SC	−0.028	−0.026	−0.075	−0.000	−0.139	0.007	0.184*
(Ref: General)	(0.027)	(0.038)	(0.051)	(0.054)	(0.102)	(0.061)	(0.083)
ST	0.020	−0.039	−0.120*	−0.065	−0.195	0.043	0.086
	(0.029)	(0.042)	(0.055)	(0.059)	(0.111)	(0.066)	(0.090)
OBC	−0.004	0.139***	0.068	−0.047	−0.156	−0.068	−0.133
	(0.022)	(0.032)	(0.042)	(0.045)	(0.084)	(0.051)	(0.068)
Wealth quintile: Poorer	−0.021	−0.010	0.027	0.102*	−0.010	0.086	−0.197*
(Ref: Poorest)	(0.025)	(0.035)	(0.045)	(0.052)	(0.091)	(0.054)	(0.077)
Middle	−0.024	−0.039	0.019	−0.025	0.262**	0.079	−0.298***
	(0.025)	(0.035)	(0.045)	(0.052)	(0.092)	(0.055)	(0.077)
Richer	−0.035	−0.028	−0.046	0.012	0.356***	0.149*	−0.331***
	(0.027)	(0.038)	(0.049)	(0.056)	(0.100)	(0.059)	(0.084)
Richest	−0.039	−0.100*	−0.066	−0.003	0.594***	0.152*	−0.358***
	(0.031)	(0.044)	(0.057)	(0.065)	(0.116)	(0.069)	(0.097)
Residence: Rural	0.053**	0.059*	0.104**	−0.011	0.017	0.054	−0.230***
	(0.020)	(0.029)	(0.038)	(0.042)	(0.077)	(0.046)	(0.063)
Region: Rayalseema	0.029	−0.079**	−0.068	0.041	−0.093	0.136**	−0.092
(Ref: Coastal Andhra)	(0.020)	(0.028)	(0.037)	(0.040)	(0.075)	(0.045)	(0.061)
Telangana	0.113***	−0.035	0.057	−0.116**	0.160*	−0.056	−0.138*
	(0.019)	(0.027)	(0.036)	(0.038)	(0.071)	(0.043)	(0.058)
Waves: 2013	−0.002	−0.152	−0.397	0.849*	−1.175	−1.252***	1.147*
(Ref: 2009)	(0.166)	(0.234)	(0.310)	(0.332)	(0.624)	(0.375)	(0.508)
2016	−0.050	−0.011	−0.203	0.189	−0.011	−0.584***	0.347
	(0.073)	(0.103)	(0.136)	(0.146)	(0.274)	(0.164)	(0.223)
Constant	0.056	−0.669	0.040	−2.866***	10.863***	4.269***	3.893***
	(0.358)	(0.504)	(0.668)	(0.713)	(1.343)	(0.806)	(1.092)
Observations	5655	5655	5655	5655	5655	5655	5655
Number of Children	1891	1891	1891	1891	1891	1891	1891

Standard errors in parentheses; ***p < 0.001, **p < 0.01, *p < 0.05. SC= Scheduled Caste; ST= Scheduled Tribe; OBC= Other Backward Class.

Table 3
Health, climatic, and agricultural adversities: Fixed effects estimates.

Variables	Sub-sample	Care Work	Household Chores	Unpaid economic work	Paid work	School	Study	Leisure and self-maintenance
Father's death	Boy	0.012	−0.128	−0.264	−0.081	−0.047	0.204	0.115
		(0.075)	(0.117)	(0.170)	(0.209)	(0.329)	(0.202)	(0.292)
	Girl	0.215*	−0.211	−0.036	0.398*	−0.813*	0.182	−0.024
		(0.104)	(0.144)	(0.150)	(0.189)	(0.330)	(0.193)	(0.279)
Father's illness	Boy	−0.010	0.091	0.016	0.064	−0.307*	0.194*	−0.110
		(0.031)	(0.048)	(0.070)	(0.086)	(0.135)	(0.083)	(0.120)
	Girl	−0.071	0.059	0.019	−0.046	−0.086	−0.058	−0.012
		(0.054)	(0.074)	(0.077)	(0.097)	(0.169)	(0.099)	(0.143)
Mother's illness	Boy	−0.027	0.056	−0.107	0.178*	−0.033	−0.066	−0.143
		(0.031)	(0.048)	(0.070)	(0.086)	(0.136)	(0.083)	(0.120)
	Girl	0.012	−0.001	−0.226**	0.049	−0.015	0.025	0.063
		(0.052)	(0.071)	(0.074)	(0.094)	(0.163)	(0.095)	(0.138)
Drought	Boy	0.065*	0.068	0.119	0.046	−0.007	0.113	−0.204
		(0.028)	(0.043)	(0.063)	(0.077)	(0.122)	(0.075)	(0.108)
	Girl	0.130**	−0.077	0.038	0.077	0.186	0.130	−0.232
		(0.047)	(0.064)	(0.067)	(0.084)	(0.147)	(0.086)	(0.125)
Flood	Boy	0.139**	0.299***	0.023	0.025	0.017	−0.155	−0.393*
		(0.049)	(0.077)	(0.112)	(0.137)	(0.216)	(0.133)	(0.192)
	Girl	−0.020	0.310**	−0.079	0.143	0.013	−0.061	−0.368
		(0.085)	(0.117)	(0.122)	(0.154)	(0.268)	(0.157)	(0.227)
Pests on crops	Boy	0.026	−0.001	0.011	−0.199*	0.218	−0.058	0.073
		(0.034)	(0.054)	(0.078)	(0.096)	(0.151)	(0.093)	(0.134)
	Girl	0.002	0.025	0.166	0.011	0.078	−0.035	−0.337*
		(0.060)	(0.083)	(0.087)	(0.110)	(0.191)	(0.112)	(0.162)
Death of or pests on livestock	Boy	−0.003	−0.037	0.197*	0.059	−0.221	−0.071	0.059
		(0.037)	(0.059)	(0.085)	(0.104)	(0.164)	(0.101)	(0.146)
	Girl	0.006	0.015	−0.009	−0.020	−0.044	−0.188	−0.087
		(0.061)	(0.084)	(0.088)	(0.111)	(0.193)	(0.113)	(0.164)
Age	Boy	0.135	−0.303	−0.833*	−0.281	1.108	0.059	−0.357
		(0.153)	(0.239)	(0.347)	(0.426)	(0.670)	(0.412)	(0.595)
	Girl	−0.121	0.243	−0.799*	0.474	−0.544	−0.058	0.629
		(0.216)	(0.299)	(0.311)	(0.393)	(0.685)	(0.400)	(0.580)
Currently not enrolled in school	Boy	0.070	0.296***	1.295***	2.187***		−0.923***	0.936***
		(0.039)	(0.062)	(0.090)	(0.110)		(0.106)	(0.153)
	Girl	0.320***	0.939***	1.184***	2.208***		−1.179***	1.923***
		(0.065)	(0.090)	(0.094)	(0.119)		(0.121)	(0.176)

Note: Number of observations for boys 3044 (1018 individuals) & Number of observations for girls 2611 (873 girls).
Standard errors in parentheses; ***p < 0.001, **p < 0.01, *p < 0.05. Controls included but not shown: place of residence, child education, father's education, mother's education, mother lives in the household, caste and religion, region of residence, rural/urban, no. Of adults in the household, wealth quintile, rounds of the survey.

7.2.2. Economic adversities

An increase in input prices reduced time spent on care work for both boys and girls by about 7 (ß = −0.114, p < 0.01) and 9.2 min (ß = −0.153, p < 0.01), respectively.[7] Additionally, it increased girls' study time by about 20 additional minutes (β = 0.325, p < 0.01). Theft or destruction of cash, crops, livestock, or housing was associated with 11.5 additional minutes spent on care work for boys (β = 0.191, p < 0.001) and by about 12 more minutes per day for girls (β = 0.193 p < 0.05).[7] It also increased time spent on household chores for girls by 19 min per day (β = 0.318, p < 0.05). In these circumstances, girls spent 17 fewer minutes on unpaid economic activities per day (ß = −0.280, p < 0.05) and 30 additional minutes on paid work (β = 0.502, p < 0.01). It is possible that theft or destruction of property reduced girls' unpaid economic work. Consequently, they spent additional time on paid activities to mitigate the economic loss associated with the adversity. The results for children out of school are substantively similar to the ones discussed for health, climatic, and agricultural adversities (Table S8 in the supplementary file).

Cumulatively, partial support was found for H2a, which states that girls shall allocate more time to care, domestic and unpaid economic activities across adversities. Girls take on care work in the event of their father's death, droughts, and theft or destruction of property. Although boys provide care work during floods, droughts, and theft/destruction of property, the effect size was small, translating to 4 min daily for droughts, 8 min for floods, and 11.5 min for theft or destruction of property. Both girls and boys take on domestic chores during floods, but girls also take on domestic chores in the event of theft or destruction of property. Boys engage in

[7] The interaction results between a child's gender (girl) and increase in input prices and child's gender and theft/destruction from random effects models showed that the interaction terms were not significant predictor of care work, suggesting that no difference was observed by sex for care work for economic adversities (Table S8).

Table 4
Economic adversities: Fixed Effects Estimates.

Variables	Sub-sample	Care Work	Household Chore	Unpaid economic work	Paid work	School	Study	Leisure and self-maintenance
Increase in input prices	Boy	−0.114**	−0.080	−0.069	0.199	0.054	0.098	−0.044
		(0.036)	(0.057)	(0.083)	(0.102)	(0.160)	(0.098)	(0.142)
	Girl	−0.153**	−0.081	0.003	0.170	0.036	0.325**	−0.149
		(0.059)	(0.082)	(0.085)	(0.107)	(0.187)	(0.109)	(0.159)
Theft/destruction (cash, crops, livestock, housing)	Boy	0.191***	0.123	0.080	−0.056	0.034	−0.078	−0.380
		(0.053)	(0.084)	(0.121)	(0.148)	(0.233)	(0.143)	(0.207)
	Girl	0.193*	0.318*	−0.280*	0.502**	−0.405	0.307	−0.260
		(0.095)	(0.132)	(0.137)	(0.173)	(0.302)	(0.176)	(0.256)
Age	Boy	0.151	−0.233	−0.829*	−0.247	1.060	0.074	−0.470
		(0.152)	(0.240)	(0.347)	(0.425)	(0.669)	(0.411)	(0.593)
	Girl	−0.160	0.234	−0.803**	0.462	−0.498	−0.034	0.627
		(0.216)	(0.299)	(0.311)	(0.391)	(0.685)	(0.399)	(0.581)
Currently not enrolled in school	Boy	0.056	0.286***	1.286***	2.204***		−0.921***	0.953***
		(0.039)	(0.062)	(0.090)	(0.110)		(0.106)	(0.153)
	Girl	0.316***	0.940***	1.183***	2.209***		−1.191***	1.925***
		(0.065)	(0.090)	(0.094)	(0.118)		(0.121)	(0.175)

Note: Number of observations for boys 3044 (1018 individuals) & Number of observations for girls 2611 (873 girls).
Standard errors in parentheses; ***p < 0.001, **p < 0.01, *p < 0.05. Controls included but not shown: place of residence, child education, father's education, mother's education, mother lives in the household, caste and religion, region of residence, rural/urban, region, no. Of adults in the household, wealth quintile, rounds of the survey.

unpaid work in the event of death or pests on livestock, whereas girls reduce their unpaid work during their mother's illness and in the event of theft or destruction of property. Thus, H2a was only partially supported. However, contrary to expectations, girls were also found to spend time on economic activities in the event of their father's death and theft or destruction of assets and property. Boys took on paid work in the event of their mother's sickness. Overall, the results show that boys were more likely to be pulled into unpaid work than girls, whereas girls were more likely to be pulled into paid economic activities. Thus, no support was found for H2b, where adversities were hypothesized to increase boys' allocation of time in paid economic activities.

Lastly, some support was found for H3a and H3b since both girls and boys lost school time during adversities. However, when boys experienced reduced time spent in school during their father's illness, it was compensated by additional time spent on study, thus providing support for H3b. During a rise in input prices, girls were able to devote additional time to study. This is likely because their time on care work goes down with a rise in input prices, and they put this time aside for studying. Lastly, boys lost time on leisure and self-maintenance activities only during droughts, whereas girls lost leisure time during pest infestations on crops. When children were not enrolled in schools, boys and girls spent similar amounts of time on paid and unpaid work.

8. Discussion and conclusion

In this paper, we shed light on gender roles manifested through the time-use patterns of children in India. West and Zimmerman (1987) state that 'doing gender' enables the creation of differences that are inherently social but have come to be viewed as "normal" and "fundamental" (pp.146). Our results uncover an arrangement that frequently privileges boys and disadvantages girls. Girls bear disproportionately greater responsibility for care work and household chores while spending fewer hours in school and leisure. It is important to note that girls spend more time studying at home. Unexpectedly, boys were *not* found to spend more time on paid work in our sample than girls. Thus, the results present a hierarchy in time use patterns in India as boys are privileged in school and leisure time and do not engage in economic activities more than girls. Hence, hegemonic cultural beliefs about gender roles, i.e., "classic patriarchy" marked by the domesticity and subservience of girls, are visible in how gender is performed in everyday practices (Kandiyoti, 1988). Aligned with the social role theory, we find that girls allocate more time to communal tasks such as housework and caregiving in accordance with India's social structure (Eagly et al., 2000; Wood and Eagly, 2012). Our findings also align with the global literature that shows gendered patterns in time use during adolescence (Hofferth, 2009; Putnick and Bornstein, 2016; Rees, 2017).

Our main contribution to the literature is to document how adversities faced by the household influence the time use patterns of girls and boys. In the event of crises or challenges, girls make a range of accommodations as captured by their time-use patterns and take on even those tasks that do not fit the normative gender roles and behaviors. Apart from performing additional care work and household chores, they also undertake paid work. Hence, not only do girls perform more chores within the household daily and during adversities, but they also contribute towards the household's economic welfare by working for pay in times of need. Furthermore, they experience reduced leisure on an everyday basis and in the event of pest infestations on crops.

When faced with adversities, boys' contribution to the household is substantively similar to that of girls. Boys engaged in unpaid work in the event of pests on or death of livestock, contributed to paid work when their mothers were sick, performed care work during climatic adversities, and contributed to household chores during floods. However, boys' privilege in time use is observed in their daily access to leisure and school time. Only during droughts, an extreme event that likely impacts the entire household, do boys experience a loss of leisure time. Furthermore, on the one occasion that their time in school was impacted negatively, it was compensated by more

time spent on educational activities at home.

Dube (1988) speaks of the cultivation of cherished qualities of *sewa* (service) and tolerance in girls that enable them to conform and adapt to expectations in marital homes. In this article, we see how it also serves the needs of the natal household. The subordinate status of girls is established through their time use patterns on a regular basis. In the event of crises or challenges faced by the household, girls make a range of accommodations as reflected by their time-use patterns and take on additional tasks to aid the household. We argue that these accommodations reinforce the subservient status of women and showcase the desired feminine quality of service and flexibility deemed essential for women in patrilineal India (Dube, 1988). Using household adversities as "social relational contexts," we find that girls take on additional work within a household when needed, over and above their current workload, a pattern that likely continues over their life course. These findings are meaningful as they demonstrate how unequal time-use patterns can be set early in life. Given the evidence on time use patterns of adult women in Indian households, it is plausible that this hierarchy of subordination and privilege serves as a heuristic in Indian families. Furthermore, these results document the construction of privilege for boys in India.

Research shows how children structure their time in India is influenced by parents and other household members and thus can demonstrate parental socialization intentions (Basu et al., 2017). However, there is also an element of choice in how children spend their time, but it is beyond the scope of this paper to disentangle choice from control in time use patterns. Moreover, agency is also likely to be conditioned by status expectations (Correll and Ridgeway, 2006) and social relations (Burkitt, 2016), which are determined by broader socio-cultural forces. Irrespective of whether control or choice led to these time use patterns, they can be instrumental in shaping the gender identity of both boys and girls, who may come to regard this privilege and subservience as inherent characteristics of their gender.

Evidence shows that discriminatory patterns in time use negatively affect girls' well-being, educational aspirations, and achievement (Pells, 2011; Ram et al., 2014). It compels them to trade off time between work and study and is detrimental to cognitive and non-cognitive skill development (Borga, 2019; Pells, 2011). Additionally, it shapes children's gender identity and gender role orientation (Halpern and Perry-Jenkins, 2016), which endure and influence other aspects of their life (Fulcher, 2010; Fulcher et al., 2008). Hence, time-use patterns in childhood and adolescence can have an enduring influence over the life course of men and women.

This study has some shortcomings. First, it is limited to only two states of India, Andhra Pradesh and Telangana, where women enjoy a relatively higher status than those belonging to the more regressive north and central regions in India (Dyson and Moore, 1983; Raju and Lahiri-Dutt, 2011). This suggests that the experience of girls could be worse or different in other parts of India. Secondly, YLS has oversampled low-income families as the explicit aim of the survey is to provide a rich understanding of the causes and consequences of childhood poverty and is not representative of India. However, despite the article's shortcomings, we believe the hierarchy of privilege and subordination observed here will be visible in similarly situated Indian households.

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Appendix A. Supplementary data

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