The impact of early childhood care and education on maternal time use in Egypt

By Caroline Krafft[1] and Ruotong Li[2]

Abstract

Women disproportionately undertake unpaid care work, particularly so in the Middle East and North Africa. This paper explores how policies, specifically early childhood care and education (ECCE), might help shift care work into the market. Using a regression discontinuity design and a difference-in-differences approach, the study evaluates the impact of children starting primary school on mothers' time use and employment in Egypt. Results show no significant changes in maternal care work or employment, although there are slight shifts in timing and type of care. Policies increasing ECCE are not guaranteed to impact care work or employment for mothers.

Keywords: Early childhood care and education; time use; employment; gender; Egypt

JEL codes: J22, J16, I25

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Statements and declarations

Competing interests

None.

Acknowledgements

This paper was supported by a grant from UN Women to the Economic Research Forum. We acknowledge the financial support of the International Labour Organization through the Government of the Netherlands and the Swedish International Development Cooperation Agency, World Bank Poverty and Equity Global Practice supported by the UK-funded Strategic Partnership for Egypt's Inclusive Growth trust fund (SPEIG TF), and World Bank MENA Chief Economist office, Agence Française de Développement, Ministry of Planning, Economic Development and International Cooperation, Egypt, and UNICEF for the Egypt Labor Market Panel Survey 2023, on which this paper is based. We appreciate the comments of participants and our discussant Dr. Racha Ramadan in the "Egypt Labor Market Panel Survey First Drafts Discussion Workshop" and participants and our discussant Abdelrahman Nagy in the "From Data to Policy: Evidence and Insights from The Egypt Labor Market Panel Survey 2023" event.

Data availability statement

The Egypt Labor Market Panel Survey data are available to researchers from the Economic Research Forum at www.erfdataportal.com. Replication Stata .do files will be made available on the corresponding author's website.

1 Introduction

Women's disproportionate unpaid care work is a key driver of gender gaps in economic outcomes. Globally, women spend 3.2 hours in unpaid care work for every hour men spend in such work (International Labour Organization 2018). This unpaid care work is a major constraint on women's participation in the labor market and contributes to a host of gender-unequal social and economic outcomes (Samtleben and Müller 2022; Connelly and Kongar 2017; Sinha et al. 2024). Gender gaps in unpaid care work – and employment – are largest in the Middle East and North Africa (MENA) region (International Labour Organization 2018; Rubiano-Matulevich and Viollaz 2019; Gottlieb et al. 2024; Verick 2018). For instance, the ratio of women's to men's unpaid care work is nearly five to one in Egypt (Atallah and Hesham 2024). While 69% of men were employed in Egypt as of 2023, only 15% of women were employed (Krafft, Assaad, and McKillip 2024).

Redistributing care responsibilities to the market through care services has reduced gender disparities in time use and promoted women's employment across a variety of contexts (Halim, Perova, and Reynolds 2023; Gelbach 2002; Blau and Tekin 2007). Childcare, in particular, plays a critical role due to the substantial impact of children on labor market gender inequality (Kleven, Landais, and Søgaard 2019; Casarico, Del Rey, and Silva 2023). Early childhood care and education (ECCE) is one such service. Past research from low- and middle-income countries highlights that in almost all cases, ECCE improves maternal labor market outcomes – it increases women's employment rates, and/or the women who are employed work longer hours (Halim, Perova, and Reynolds 2023). When other aspects of their time use are studied, research also often shows women spend less time in unpaid care work when they have

ECCE for their children (Angeles et al. 2012; Calderón 2014; Fang and Miao 2024; Mata 2024). ECCE can thus play a critical role in women's time use.

This paper tests the potential of ECCE to decrease women's unpaid care work and increase their employment in Egypt, a context with long hours of unpaid care work and low employment rates for women (Assaad, Krafft, and Selwaness 2022; Atallah and Hesham 2024; Krafft, Assaad, and McKillip 2024). Using the 2023 Egypt Labor Market Panel Survey (ELMPS), this study examines how ECCE affects women's time use and employment. The analysis employs both a regression discontinuity design (RDD), leveraging the primary school enrollment age cutoff, and a difference-in-differences (DID) approach incorporating both the age cutoff and survey timing variation. The findings show that in Egypt, ECCE does not reduce mothers' overall time spent on unpaid care work, nor does it increase mothers' employment rates or hours spent in employment. ECCE may slightly shift the timing and types of care work mothers engage in but is no guarantee of decreases in care work and increases in employment.

These findings contrast with the majority of the literature finding ECCE decreases care work and increases maternal employment (Halim, Perova, and Reynolds 2023; Gelbach 2002; Swart, Van Den Berge, and Van Der Wiel 2019; Dang, Hiraga, and Viet Nguyen 2022). Different contexts may lead to varying effects of ECCE on maternal outcomes (Fitzpatrick 2012; Gangl and Huber 2025). This disparity may be in part due to relatively short days of primary school in Egypt; past research has demonstrated that short days of ECCE can lead to no impact or even reductions in employment in other low-employment contexts (Medrano 2009; Krafft and Lassassi 2024). Primary school also creates additional care responsibilities in preparing children for the school day, taking children to and from school, and helping with their learning and homework after school. Even during times when these direct care responsibilities are alleviated –

when children are in school – mothers may substitute into indirect care work, undertaking household chores. Strong gender norms that emphasize a female homemaker and male breadwinner role in MENA and Egypt (El-Feki, Heilman, and Barker 2017; National Council for Women, Baseera, and World Bank 2023) may also help explain why, even when ECCE is available, expanded or subsidized (Caria et al. 2022; Krafft and Lassassi 2024), it does not increase women's employment.

2 Data

2.1 Egypt Labor Market Panel Survey 2023

The ELMPS 2023 is the fifth wave of a panel survey (1998, 2006, 2012, and 2018 waves preceded 2023), which has tracked split households and added a refresher sample every wave.[1] The survey is household-based, but collects data on every member within the household, with detailed individual interviews for those aged six and older. The individual module covers a variety of topics, including, pertinently for this study, child care, education, employment, and time use. This study uses the 2023 wave of the ELMPS, as it was the first wave to collect a time use diary (Assaad and Krafft 2024; OAMDI 2024). The full ELMPS sample in 2023 includes 70,636 individuals and 17,784 households (Assaad and Krafft 2024), although, as discussed below, we use subsets of the sample in specific analyses.

2.2 Outcomes

The key outcome of interest is how women spend their time. The time use module is a 24-hour time diary for the day preceding the interview, collecting data on when the individual woke up (or midnight if still awake) until midnight at the end of the day. What the individual did as a primary activity, whether they did any secondary activity, and if so what activity are collected for each activity, along with the duration of the activity (in fifteen-minute increments;

results present outcomes in units of hours but underlying quarter-hours go into calculations). Analyses distinguish the time spent in *direct* caregiving, which includes time spent, as a primary or secondary activity, on any of: Childcare and instruction; Care for dependent adults; Help to non-dependent adult household and family members; Travelling and accompanying goods or persons related to unpaid caregiving services for household and family members; Other activities related to unpaid caregiving services for household and family members.

Analyses also examine *indirect* caregiving, which includes time spent, as a primary or secondary activity, on any of: Food and meals management and preparation*; Cleaning and maintaining of own dwelling and surroundings*; Do-it-yourself decoration, maintenance and repair; Care and maintenance of textiles and footwear; Household management for own final use; Pet care; Shopping for own household and family members*; Travelling, moving, transporting or accompanying goods or persons related to unpaid domestic services for household and family members*; Other unpaid domestic services for household and family members. In additional analyses, we break down the types of indirect caregiving denoted with an asterisk (*) above and a residual category of "other" indirect caregiving. Total time spent in "any" caregiving is time spent in either direct or indirect activities as a primary or secondary activity (which is not necessarily the sum of the two, as it could be that the primary activity is indirect care and the secondary activity direct care if, for example, a woman is cooking dinner while supervising children).

Another outcome analyses consider is time spent in employment, as a primary or secondary activity. Analyses measure this from the time-use module response category: Employment and related activities. Time spent on employment is the intensive margin of employment; as an alternate outcome, analyses also examine whether individuals were employed

or not in the past seven days, based on employment detection questions. In additional analyses, we also look at time spent in primary and secondary direct care, indirect care, any care, and employment, separating out primary versus secondary time.

2.3 Key covariate: Early childhood care and education

Although ECCE by definition covers a broader age range, from birth to age eight, since this work focuses on the impact of primary education on time use, ECCE is defined more narrowly. For children under age six, there is a question in the household roster as to whether they attend a nursery, child care, or kindergarten, and if yes, the type, where responses include public and private kindergartens, which are counted as ECCE. Children who were age six or older at the time of the survey are asked the full individual questionnaire, including the education section.[2] There, a question inquires whether an individual has ever been to school, and if so the highest level entered, where response options include pre-primary/kindergarten or primary. Analyses focus on the key covariate of any ECCE (either pre-primary/kindergarten or primary).

2.4 Control variables

The analysis includes control variables for DID and in an additional sensitivity analysis for RDD, as well as using these variables to check assumptions. Building on previous literature, we control for factors that may influence women's time use and employment. Specifically, household location is considered, by region (Connelly and Kongar 2017) (which incorporates urban versus rural). For women, the analysis controls for education level (Elsayed and Shirshikova 2023), age group (Besamusca et al. 2015), and being ever married (Carta and Rizzica 2018; Kimmel 1998; Wikle and Wilson 2023). Moreover, husbands' behaviors are crucial to maternal outcomes (Skoufias 1993). Therefore, we control for husbands'

characteristics, including their presence in the household, education level and age group (education and age with categories for spouse absent so that the sample is not reduced).

3 Methods

3.1 Regression discontinuity design

This paper relies on a regression discontinuity design (RDD) approach, based on a cutoff for school eligibility. The cutoff is based on the child's age September 30 (IEA PIRLS 2021). Children aged six by September 30 can begin primary school. This paper analyzes children around the age six (primary start) cutoff, focusing on an analysis sample (bandwidth) that is six months above and below that cutoff on September 30 ("age six group"). Age six is not necessarily their age at the time of fielding. The start of the school year was also September 30 in 2023 (Egypt Independent 2023). Because ECCE can only affect time use when it is in session, we restrict our RDD analyses to households with a first visit date of October 1 or later,[3] so the time diary would refer to September 30 or later.

The ELMPS 2023 data capture birth month and year but not day. Fortunately, with a cutoff of September 30, children born in September would all be six before the cutoff and October-born children six after, so the lack of day does not affect the identification strategy. The analyses transform the age to be an assignment variable in years relative to being age six on September 30, so that those who were age six by September 30 have positive values and those who were not yet negative numbers. The cutoff is set at zero using this metric. Based on a question about their mother's line number in the household, we can map children's characteristics, including their age and ECCE, onto their mothers.[4] Focusing on the age six group yields an analysis sample of 1,311 mothers.

The cutoff is not mandatory (there is high but not 100% compliance past the cutoff and children can be enrolled, particularly in pre-primary, at younger ages), making it a fuzzy RDD (FRDD).[5] In a FRDD framework, the estimator of the treatment effect of ECCE on outcomes is the ratio of the jump in an outcome (e.g., mother's time spent in direct care) to the jump in the probability of treatment (ECCE) (Imbens and Lemieux 2008; Lee and Lemieux 2010).

Formally, T_i is the treatment (ECCE), and Y_i is the outcome of interest (e.g., time spent on care work). c denotes the cutoff (age six on September 30th) and X_i the age in years from that cutoff. D_i is an indicator variable for being above the cutoff, i.e. D_i=1[X_i≥c]. Using this notation, the effect of the assignment variable and cutoff on treatment (first stage, jump in the probability of treatment) is:

$$T_i = \alpha + f(X_i - c) + \beta D_i + \varepsilon_i$$

Where *f()* is a polynomial functional form, which can have varying parameters on each side of the cutoff (a local linear regression). β is the parameter of interest in this first stage and must be statistically significant in order to have a valid identification strategy – there must be a jump in primary enrollment at the cutoff. The second stage is estimated based on:

$$Y_i = \gamma + g(X_i - c) + \tau T_i + \nu_i$$

Where, as with *f*(), *g*() is some polynomial functional form, which can again have varying parameters on each side of the cutoff.[6]

In terms of selecting a polynomial functional form, research has shown higher-order polynomials tend to be problematic and the recommendation is to consider only order zero (intercept only), one (linear) or two (quadratic) options (Gelman and Imbens 2019). The main model's polynomial functional form is selected based on the specification with the smallest

Akaike information criterion (AIC) in the reduced form model (the recommended approach for model selection (Lee and Lemieux 2010)). The reduced form model is:

$$Y_i = \gamma + g(X_i - c) + \tau D_i + \nu_i$$

In this reduced form model, τ is an intent-to-treat parameter, estimating the impact of having a child above the cutoff (and thus eligible for ECCE) on outcomes. To use a consistent functional form across outcomes, model selection is based on the any care hours outcome for mothers.

3.2 Sensitivity Analyses for FRDD

To assess robustness of our FRDD results, the analysis first explores alternative polynomial specifications. Furthermore, two-stage least squares (2SLS) versions of the main model are presented. Another critical decision in the FRDD approach is the selection of bandwidth around the cut-off, within which the results are estimated. To test the sensitivity of the results to bandwidth choice, the analysis halves the six-month bandwidth used in the main model. Additionally, while covariates should be irrelevant to estimation if they are balanced and the assignment variable is effectively random, their inclusion can improve precision. Therefore, the sensitivity analyses also include estimates with covariates to enhance robustness.

3.3 Difference-in-Differences

As an alternative method to establish the impact of ECCE, we apply a difference-in-differences (DID) approach that leverages variation in interview timing and children's birth dates. Specifically, we categorize interviews as occurring before or after the start of the school year (September 30, parameterized in the variable $After^7$), our "time" variable in the DID framework. We classify women as treated with ECCE in the DID framework if they have at least one child who is primary school-eligible (aged 6–8 as of September 30th, $Eligible^8$). Women may *also* have younger children. Our control group is women who have young children, but

none who are primary eligible (all children under six as of September 30th). Following Duflo (2000), we specify the following regression model:[9]

$$Y_i = \beta_0 + \beta_1 Eligible_i + \beta_2 After_i + \beta_3 Eligible_i \times After_i + \beta_k X_{i,k} + \gamma_{g,u} + v_i$$

Our primary focus, β_3, the coefficient on the interaction term, estimates the effect of ECCE (specifically primary school). The term $X_{i,k}$ includes the same control variables as used in the FRDD design, except for regional variables, which are redundant when $\gamma_{g,u}$ is included. $\gamma_{g,u}$ denotes governorate (first level administrative geography) and urban (vs. rural) interaction fixed effects, since fieldwork was done by governorate teams and as we show below there was some variation in fielding timing across geographies.

A number of assumptions must hold for DID to estimate a causal effect. DID allows for differences between the treatment and control groups, so long as in the absence of the school year starting we would expect similar behavior (parallel trends). One way this assumption could be violated is if different women were interviewed before versus after the school year start. To test for potential issues from non-random timing of interviews around September 30th, we compare the characteristics of mothers and their spouses interviewed before or on versus after this date. Table 8 and Table 9 in the appendix present t-tests for these comparisons. Aside from region, only a few characteristics show statistically significant differences, and even these differences are minor and likely due to random chance. We therefore, as mentioned above, control for governorate and urban/rural interactions in our DID model.

Other standard DID assumptions are harder to test but could be reasonably met within our study context. The no anticipation effect assumption appears valid since knowing the school start date likely had minimal influence on maternal time use prior to its onset. The stable unit treatment value assumption likely holds here, as treated mothers having their children in school

do not impact the time use of those whose children are not eligible. Finally, the school start date is determined at a national level, thereby ensuring the exogeneity of the treatment.

3.4 Heterogeneity Analyses

Given the differences in mothers' work schedules and children's school, both of which play a key role in shaping maternal time allocation (Cardoso, Fontainha, and Monfardini 2010), ECCE may impact mothers differently on weekdays compared to weekends, as well as during school hours versus non-school hours. Therefore, additional analyses estimate the effects of ECCE on maternal time use separately for weekdays and weekends, and for school hours and non-school hours. In Egypt, weekdays are from Sunday to Thursday, and weekends are Friday and Saturday. School hours are specified from 8:00 am to 12:15 pm on weekdays,[10] while non-school hours are any time outside of this window on both weekdays and weekends.

Past research on the effects of ECCE has emphasized effects may be differential when the youngest child in the household has access to ECCE (Berlinski, Galiani, and McEwan 2011; Cascio 2009; Gelbach 2002; Ryu 2020), so in one set of heterogeneity analyses we estimate impacts of ECCE for only mothers whose youngest child, specifically, is in the age six (for FRDD, or 6-8, for DID) group. Moreover, building on previous studies identifying potential sources of variation in ECCE impacts, additional analyses using both FRDD and DID explore whether ECCE effects vary across maternal education levels (Carta and Rizzica 2018),[11] rural versus urban settings (El-Kogali and Krafft 2015), gender norms (Cortés and Pan 2023) about caregiving[12] (both maternal and spousal), and household structures (Talamas Marcos 2023) (nuclear versus extended families).[13]

4 Results

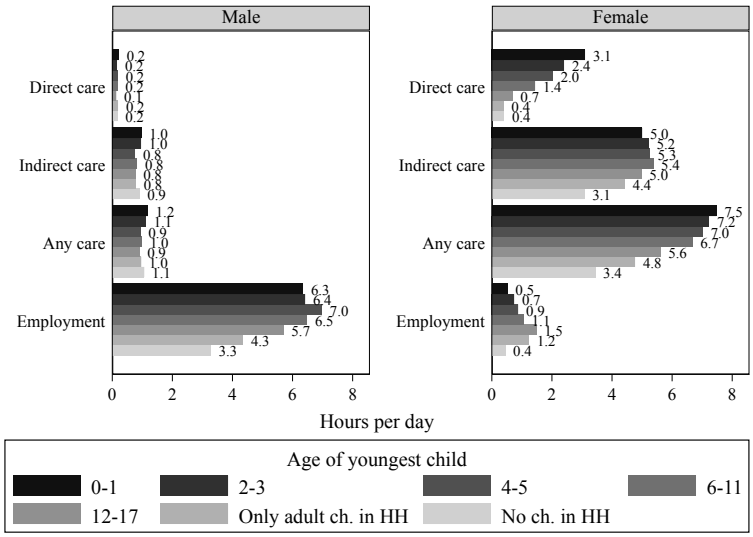
The results initially present descriptive patterns of care work and time use by gender and children's age to provide context on the substantial time spent on care work (for women) and how it varies by children's age (for women). We then, in the next sub-section, present checks of the FRDD assumptions, before turning to the main FRDD estimates. Sensitivity analyses to FRDD functional form assumptions, bandwidth, and controls follow in the next sub-section. We afterward turn to the DID estimates in the following sub-section. The final sub-section of results presents heterogeneity analyses for both FRDD and DID estimates.

4.1 Patterns of care work and time use

Figure 1 presents time use (average hours per day) in care work and employment, by sex and the age of their youngest child for ever married women aged 15+ and their husbands.[14] The results show the gendered division of labor within households. Men engage in at most 0.2 hours per day of direct care and 1.0 hours of indirect care, regardless of whether or what age children are in the household. In contrast, women with youngest children aged 0-1 spend the most time in direct care, 3.1 hours per day, and 5.0 hours of indirect care. While direct care decreases as children get older, indirect care does not (e.g., 5.0 hours per day if youngest children are 0-1 or 12-17). Women engage in a full shift of care work when looking at "any" care work, as high as 7.5 hours per day for those with youngest children 0-1 and still 6.7 hours per day for women with youngest children aged 6-11 (primary age). This time spent on care is quite similar to the hours men with children spend in employment, which varies from 5.7-7.0 hours per day across youngest children's ages. Because few women are employed, their hours of employment are much lower, but do tend to increase with children's age, from an average of 0.5 hours per day for women with youngest children aged 0-1 to 1.5 hours per day for women with youngest children

aged 12-17. These patterns suggest potential for ECCE alleviating women's long hours of care work and increasing their employment, a question we test in subsequent sections.

Figure 1. Time (average hours per day) in care work and employment, by sex and age of youngest child in the household, ever married respondents aged 15+



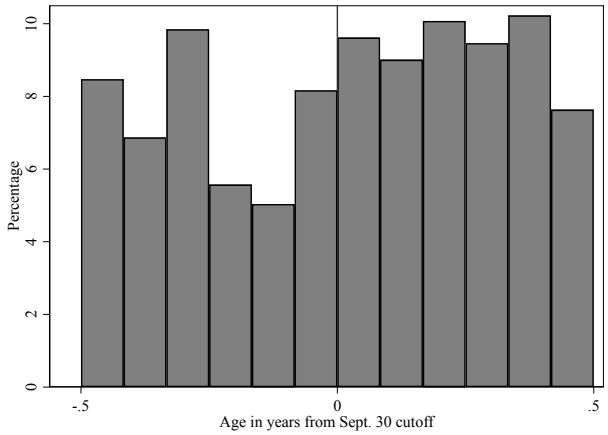
Source: Author's calculations based on ELMPS 2023
Notes: Age of the youngest child of women based on their children present in the household. Mapped onto women's husbands (if in household) for men. No children could thus still mean the household has grandchildren or other relatives to care for.

4.2 Regression discontinuity design assumptions

Analyses for FRDD focus on households visited in October or later, after school had started. Figure 2 checks an important assumption of the strategy that households are not manipulating the age of children to change their eligibility for school. This check focuses on our primary sample of mothers with children in the "age six group." Conceptually, it is fairly challenging to manipulate birth timing six years in advance of school start age. However, it is also possible that families or enumerators could be mis-reporting ages in order to avoid answering the individual questionnaire (asked of age six and above), as similar issues have been identified in other household surveys (Krafft, Assaad, and Cheung 2024; Pullum and Staveteig

2017). This displacement does not appear to be the case in the ELMPS 2023. If anything, there are slightly more individuals whose age makes them above age six on September 30. Tests for equivalent density do show significant but modest differences with slightly more children above the cutoff overall.[15] There particularly does not appear to be any manipulation of the month right near the cutoff.

Figure 2. Histogram (percentage of observations in each month of age) around the age six cutoff



Source: Authors' calculations based on ELMPS 2023
Notes: Showing the distribution of children around the age six cutoff for the sample of their mothers.

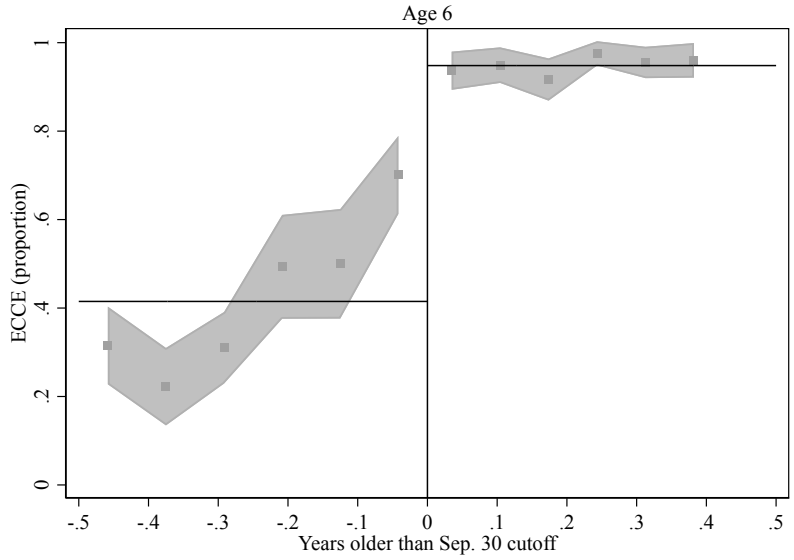
A key assumption is that mothers are not otherwise different around the cutoff. Table 10, in the appendix, tests that assumption, undertaking t-tests comparing mothers above and below the age six cutoff in terms of variables for themselves and their spouses. There are only three characteristics (out of 40) where there are significant differences, similar to what one would expect by chance. Mothers below the cutoff are slightly more likely to be under age 25 (8.3% vs. 5.4%), but that is the only age difference. Those above the cutoff are more likely to be in urban Upper Egypt (18.1% vs. 13.4% below), and correspondingly less likely to be in rural Upper Egypt (40.2% above vs. 46.2% below). There are no significant education differences,

differences in being married, whether the spouse is present, or in any spouse characteristics. A regression testing whether these controls predict being above the cutoff versus below has an F-statistic of 0.96 (p-value of 0.544). Characteristics are thus overall balanced across the cutoff.

4.3 Regression discontinuity design estimates

The main model specification is determined based on the smallest AIC for the mother's any care hours, shown in the appendix, in Table 11. The intercept specification, with the lowest AIC, is thus the main model and preferred specification. Figure 3 examines the crucial question of whether there is in fact a discontinuity in ECCE around the cutoff. [16] The figure presents bin (month) means for the proportion in ECCE, the confidence interval around those means, and an intercept fit on each side of the cutoff. There is a clear jump in ECCE above the cutoff, confirming a valid identification strategy. Although ECCE rises with age to the cutoff,[17] it is near universal past the cutoff, when children would be eligible for primary.

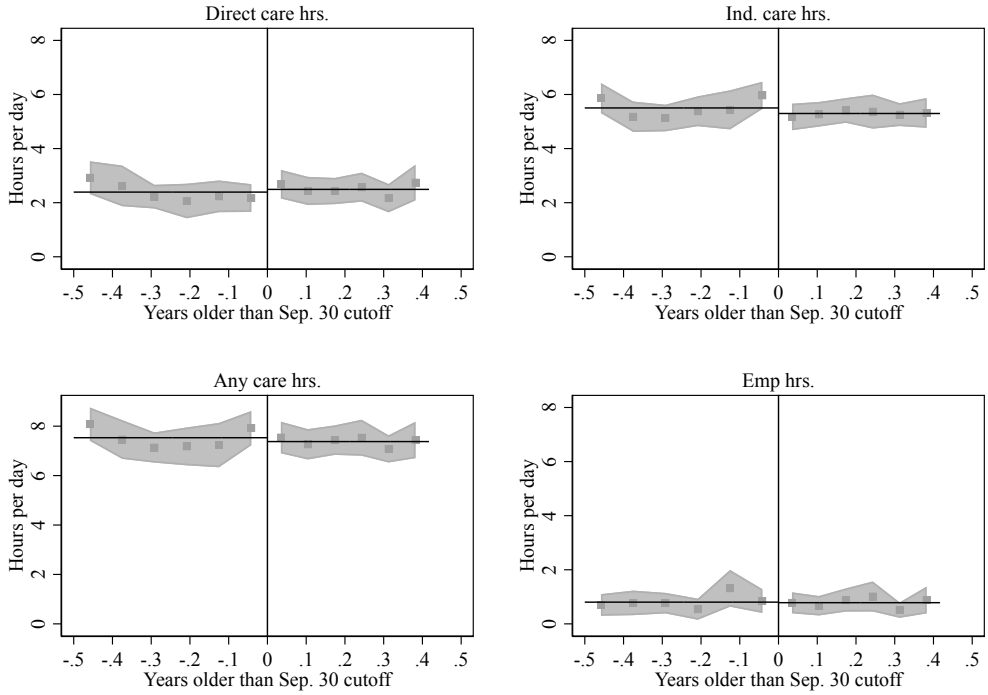
Figure 3. Children's ECCE (proportion), by child's age in years from September 30, mothers with child in age six group



Source: Authors' calculations based on ELMPS 2023
Notes: Points are bin means (months). Gray band is confidence interval around bin means. The line is an intercept-only fit at each side of the cutoff.

Figure 4 explores maternal time use outcomes, in average hours per day, around the age six on September 30 discontinuity for primary, using the preferred intercept specification in the visual. Although reduced form visualizations and not formal tests of impact, these results are consistent with those subsequent tests. On both sides of the cutoff, direct care hours are slightly more than two per day. There are, if anything, very slightly higher direct care hours above the cutoff, but the confidence intervals suggest differences are not significant. Women undertake more than five hours of indirect care work per day, on both sides of the cutoff. Indirect care hours are very slightly lower above the cutoff, but confidence intervals suggest these differences are unlikely to be significant. Any care hours average more than seven per day on both sides of the cutoff, and show a similar pattern, very slightly less above the cutoff but unlikely to be a significant difference. Average hours of employment are around one per day, and identical on both sides of the cutoff. These results suggest that having a child be able to access primary does not appreciably change either time spent on care work or time spent in employment for women with children near the primary age cutoff.

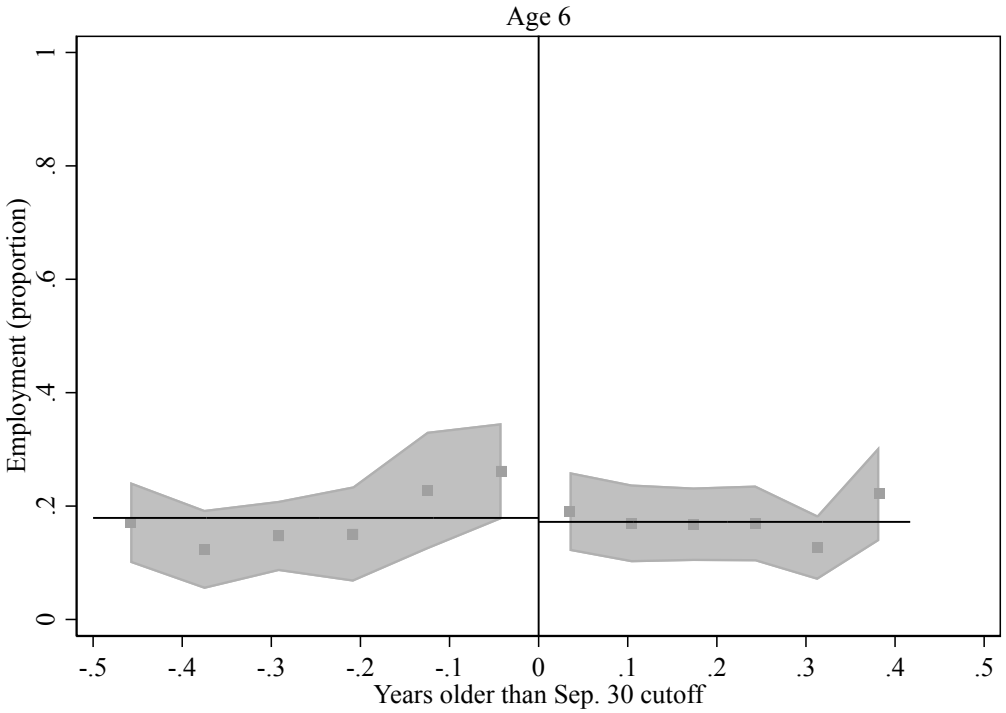
Figure 4. Maternal time use outcomes (average hours per day), by child's age in years from September 30, mothers with child in age six group



Source: Authors' calculations based on ELMPS 2023
Notes: Points are bin means (months). Gray band is confidence interval around bin means. The line is an intercept-only fit at each side of the cutoff.

Figure 5 explores employment on the extensive margin, whether women are employed at all around the cutoff. The probability of being employed is below 20% on both sides of the cutoff and is, if anything, very slightly lower above the cutoff, when children would be eligible for primary, although confidence intervals suggest differences are not significant.

Figure 5. Maternal employment (proportion), by child's age in years from September 30, mothers with child in age six group



Source: Authors' calculations based on ELMPS 2023
Notes: Points are bin means (months). Gray band is confidence interval around bin means. The line is an intercept-only fit at each side of the cutoff.

Table 1 presents the FRDD intercept models of maternal outcomes for mothers with children in the age six group. Notably, with all estimation methods, the first stage is quite strong, a significant 53 percentage point increase in ECCE around the primary cutoff. The patterns in the treatment effect estimates are consistent with those presented in the figures above; slightly higher (0.19 hours per day) direct care hours, 0.39 fewer indirect care hours, 0.29 fewer any care hours, 0.04 fewer employment hours, and a 1.3 percentage point reduction in employment. None of these impacts is statistically significant. Thus, overall, ECCE is not reducing care work nor is it increasing employment on the extensive or intensive margins.

Table 1. FRDD intercept models of maternal outcomes, mothers with a child in age six group

	Direct care hrs.	Indirect care hrs.	Any care hrs.	Employment hrs.	Employed
ECCE	0.190	-0.386	-0.292	-0.037	-0.013
	(0.309)	(0.291)	(0.375)	(0.239)	(0.040)
First	0.531***	0.531***	0.531***	0.531***	0.532***
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
N (Obs.)	1303	1303	1303	1303	1307
N right	730	730	730	730	732
N left	573	573	573	573	575

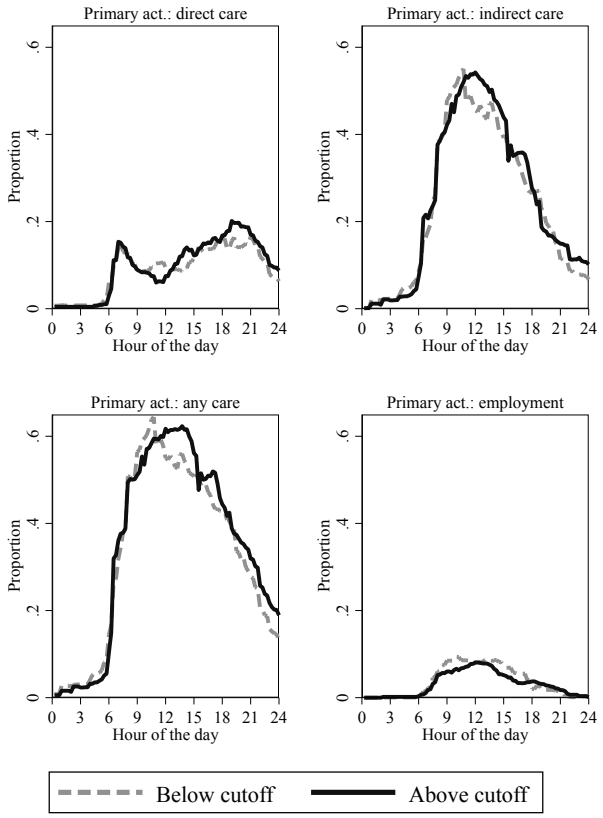
Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. Standard errors in parentheses. Sample consists of mothers with a child in the age six group (+/- six months of age six on Sept. 30) who have non-missing outcome data. "First" denotes the first-stage discontinuity in ECCE. N right denotes the number of observations to the right of the cutoff; N left denotes the number of observations to the left of the cutoff, and N (Obs.) is the total number of observations (sum of N left and N right).

How can mothers *not* have time freed up by sending children to ECCE? Figure 6 explores the time patterns, over the day, of mothers with children in the age six group by whether their child is above or below the cutoff. The proportion of mothers engaged in direct care, indirect care, any care, or employment is shown by quarter hour over the course of the day. Direct care rises starting around 6:00AM and is very slightly higher around 7:00AM-7:45AM for mothers whose children are primary eligible, possibly as they prepare their children for school. Direct care is then very similar into the 9:00AM hour, and then it is lower for those with children eligible for primary until around 12:30PM, when schedules converge again. Thereafter, direct care is either similar between the groups or higher for mothers with children eligible for primary, particularly right after school and in the evening when they might be doing homework. Figure 7, in the appendix, shows the school schedule for primary students aged 10+ (who answered the individual time use module). A majority are in school at 7:45AM and 75% by 8AM. At 12:15PM is the last time 75% are in school and 1:15PM the last time 50% are in school. The patterns observed for direct care are thus consistent with mothers taking young children to school

(potentially increasing care work), having a slight reduction in direct care work for a few hours of school, and then picking children back up from school and having additional responsibilities after school.

Figure 6. Proportion spending time on various primary activities each quarter hour by below/above age six September 30 cutoff, mothers with child in age six group



Source: Authors' calculations based on ELMPS 2023

Figure 6 also shows the proportion of time spent in indirect care work, any care work, and employment by hour of the day. Indirect care work is lower for mothers with children above the cutoff (eligible for primary) starting around 7:30AM, and remains so through around 8:15AM, likely through drop-off for school. Indirect care is then higher for mothers with ECCE eligible children during the school hours and into the afternoon. When they have time freed from direct care, women's time shifts into indirect care. Women do not substitute into employment

during school hours; aside from briefly around noon, women with children eligible for primary are less likely to be spending time in employment during the school day and into the afternoon; they spend slightly more time employed in the evening.

4.4 Sensitivity analyses for FRDD

We undertake a number of sensitivity analyses testing the FRDD specification. The results of the reduced form models are presented in Table 11, in the appendix, estimating the direct effect of being above the cutoff under different specifications. Unsurprisingly, none of the reduced form intercept models show a significant impact of being above the cutoff (eligible for primary) on any of the outcomes. In the linear reduced form model, there is a significant increase in direct care hours when eligible for ECCE, but this disappears in the quadratic specification. The quadratic specifications for indirect care hours show a significant decrease above the cutoff, but also a significant decrease in the probability of employment.

In Table 12 (in the appendix), halving the bandwidth showed all insignificant results, similar to the main estimates in Table 1. Table 13 (in the appendix) examines a linear functional form (polynomial degree one). Again, the estimates remained all insignificant. Table 14 (in the appendix) applies a quadratic functional form (polynomial degree two). The first stage is no longer significant, and the estimates are all implausibly large, but also insignificant. Table 15 presents the two-stage least squares (2SLS) results from the intercept FRDD estimation. The first stage, which uses the cut-off indicator as an instrument for ECCE, shows a strong and significant relationship. In the second stage, the main results are necessarily mathematically identical to Table 1, but with different (robust) standard errors. All remain statistically insignificant. Table 16 presents the FRDD model results with controls. The findings remain consistent with those from the model without controls (Table 1), reinforcing the robustness of the estimates. Overall,

these specification checks show no significant effect of ECCE on maternal time use or employment. Almost all the different specifications are also well-powered in the first stage to detect effects.

4.5 Difference-in-Differences estimates

Table 2 presents the results from the DID analysis. Our main focus is on the effect of ECCE during the school year for those with primary eligible-age (aged 6-8) children on maternal outcomes, shown in the row labeled "Moth. w/ kids (age 6-8) * During school year." There are no statistically significant impacts of this interaction, and coefficients are small.

Table 2. DID models of maternal outcomes, mothers with at least one child aged 6-8 versus mothers with only children aged under 6

	Direct care hrs.	Indirect care hrs.	Any care hrs.	Employment hrs.	Employed
Moth. w/ kids (age 6-8)	-0.446**	0.218	-0.053	-0.004	0.040*
	(0.172)	(0.159)	(0.203)	(0.123)	(0.020)
During school year	0.375*	0.241	0.563**	-0.102	-0.006
	(0.147)	(0.136)	(0.173)	(0.105)	(0.017)
Moth. w/ kids (age 6-8)*During school year	0.231	0.115	0.282	0.009	-0.005
	(0.184)	(0.170)	(0.217)	(0.132)	(0.021)
Constant	0.043	2.121**	2.228*	2.721***	0.492***
	(0.804)	(0.743)	(0.946)	(0.573)	(0.097)
Controls	Yes	Yes	Yes	Yes	Yes
Governorate*urban	Yes	Yes	Yes	Yes	Yes
N (Obs.)	5971	5971	5971	5971	5980

Source: Authors' calculations based on ELMPS 2023
Notes: *p<0.05; **p<0.01; ***p<0.001. Standard errors in parentheses. The sample consists of mothers with only children under age 6 and those with at least one child aged 6-8 who have non-missing outcome data.

4.6 Sensitivity analyses for DID

The results in Table 2 compare mothers with at least one child aged 6-8 to those with only younger children, with controls included. For robustness, we also provide several sensitivity analysis results in the appendix: Table 17 shows results without controls for the same groups; Table 18 and Table 19 compare mothers with at least one child aged 6-11 or 6-17 to those with

only younger children (with controls). Across these variations, the results of no significant impact of ECCE (eligible children during the school year) remain consistent.

4.7 Heterogeneity analyses

There may be differential effects of ECCE when the child attending ECCE is the youngest in the household. To check this possibility, in the FRDD analysis, we conducted an analysis focusing on households where the child in the "age six group" is the youngest offspring of the mother. Since this is a different sample, we rechecked the distribution of children on both sides of the cutoff for FRDD, and the tests for equivalent density do not show significant differences for this sample. The FRDD results, presented in Table 20, remain all insignificant (although the first stage remains significant), suggesting there is not a sizeable differential impact when ECCE becomes available for the youngest child. Moreover, we conducted a similar analysis using DID. The DID results, presented in Table 21, align with the FRDD findings, showing no significant impact of ECCE on maternal time use for mothers whose youngest child is aged 6-8.

Considering the differences in mothers' work schedules and children's school hours, ECCE may affect mothers differently on weekdays compared to weekends. Table 3 illustrates these differences for the time use outcomes using the FRDD model. One estimated impact of ECCE is significant: an 0.7 hour per day reduction in indirect care on weekdays (versus an insignificant 0.3 hour per day increase on the weekend). ECCE may thus slightly shift when care work is being done. Similarly, we analyzed the heterogeneous effects of ECCE on weekdays versus weekends using the DID model. The results, presented in Table 22 (comparing mothers with only children under age 6 to those with at least one child aged 6-8), do not show significant ECCE impacts for weekdays or weekends.

Table 3. FRDD intercept models of maternal outcomes, mothers with a child in the age six group, weekday versus weekend time use

	Direct care hrs.		Indirect care hrs.		Any care hrs.		Employment hrs.	
	Weekday	**Weekend**	**Weekday**	**Weekend**	**Weekday**	**Weekend**	**Weekday**	**Weekend**
ECCE	0.611	-0.754	-0.707*	0.342	-0.294	-0.278	-0.231	0.417
	(0.369)	(0.571)	(0.353)	(0.516)	(0.451)	(0.684)	(0.300)	(0.389)
First	0.517***	0.565***	0.517***	0.565***	0.517***	0.565***	0.517***	0.565***
	(0.025)	(0.040)	(0.025)	(0.040)	(0.025)	(0.040)	(0.025)	(0.040)
N (Obs.)	928	375	928	375	928	375	928	375
N right	516	214	516	214	516	214	516	214
N left	412	161	412	161	412	161	412	161

Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. The "weekday" sample consists of mothers with a child in the age six group (+/- six months of age six on Sept. 30) who completed the time use diary for a weekday (Sunday–Thursday), with non-missing outcome data. The "weekend" sample includes mothers with a child in the age six group (+/- six months of age six on Sept. 30) who completed the time use diary for a weekend day (Friday–Saturday), also with non-missing outcome data. "First" refers to the first-stage discontinuity in pre-primary education. N right denotes the number of observations to the right of the cutoff; N left denotes the number of observations to the left of the cutoff, and N (Obs.) is the total number of observations (sum of N left and N right).

Since the effects of ECCE on time use may vary across school versus non-school hours (as suggested in Figure 6), we explore the effects of ECCE on maternal time use outcomes during school hours and non-school hours separately using both FRDD model and DID model. The FRDD results (appendix Table 23), show that there are not significant differences during school hours or during non-school hours in any of the outcomes. The DID results in Table 4 do show some significant differences. During non-school hours, mothers exhibit a significant 0.7-hour increase in direct care, compared to an insignificant and near-zero change in direct care during school hours. Conversely, indirect care increases by 0.4 hours during school hours, while non-school hours see a smaller and statistically insignificant 0.2-hour increase in indirect care. Any care time has a significant 0.9-hour rise during non-school hours and a smaller but significant 0.4-hour increase during school hours. These results suggest ECCE may both increase and shift maternal care responsibilities, with more direct care during non-school hours and more indirect care during school hours. One reason for the differences with the FRDD results may be that as children get older (not just grade 1 used in FRDD but grades 2 and 3 in the DID), mothers take on additional direct care work assisting with studying and homework.

Table 4. DID models of maternal outcomes, mothers with at least one child aged 6-8 versus mothers with only children aged under 6, school-hours versus non-school-hours time use

	Direct care hrs.		Indirect care hrs.		Any care hrs.		Employment hrs.	
	School	**Non-school**	**School**	**Non-school**	**School**	**Non-school**	**School**	**Non-school**
Moth. w/ kids (age 6-8)	-0.213*	-0.920***	0.035	0.320	-0.178	-0.600	0.026	-0.016
	(0.091)	(0.237)	(0.114)	(0.228)	(0.140)	(0.329)	(0.074)	(0.100)
During school year	0.112	0.186	0.017	-0.323	0.129	-0.138	-0.015	-0.141
	(0.076)	(0.203)	(0.095)	(0.195)	(0.116)	(0.281)	(0.062)	(0.086)
Moth. w/ kids (age 6-8)*During school year	0.041	0.724**	0.363**	0.225	0.404**	0.949**	-0.025	-0.007
	(0.096)	(0.255)	(0.120)	(0.245)	(0.148)	(0.353)	(0.078)	(0.107)
Constant	-0.012	0.567	0.488	2.784**	0.476	3.351*	1.019***	1.874***
	(0.379)	(1.111)	(0.475)	(1.067)	(0.582)	(1.538)	(0.309)	(0.469)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Governorate*urban	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N (Obs.)	4178	5992	4178	5992	4178	5992	4178	5992

Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. The "school hours" columns include mothers with only children under age 6 and those with at least one child aged 6-8, focusing on time use during school hours (8:00 am–12:15 pm, Sunday–Thursday), with non-missing outcome data. The "non-school hours" columns consist of these mothers outside school hours, including Friday–Saturday and non-school hours on Sunday–Thursday, also with non-missing outcome data.

ECCE could differentially impact different types of indirect care hours. To explore this possibility, we analyze the effect of ECCE on specific types of indirect caregiving using both FRDD model and DID model. The FRDD results, presented in Table 5, show ECCE leads to a significant decrease in food preparation hours (0.4 hours per day), but no other differences are significant and are a mix of small decreases (cleaning and travel) and small increases (shopping and other indirect care). The DID results, detailed in the appendix (Table 24 for mothers with at least one child aged 6–8), however, show ECCE does not significantly affect any specific type of indirect caregiving.

Table 5. FRDD intercept models of maternal outcomes, mothers with a child in the age six group, different types of indirect care activities

	Food	**Cleaning**	**Shopping**	**Travel**	**Other indirect**
ECCE	-0.369*	-0.340	0.129	-0.054	0.113
	(0.176)	(0.199)	(0.104)	(0.041)	(0.149)
First	0.531***	0.531***	0.531***	0.531***	0.531***
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
N (Obs.)	1303	1303	1303	1303	1303
N right	730	730	730	730	730
N left	573	573	573	573	573

Source: Authors' calculations based on ELMPS 2023
Notes: *p<0.05; **p<0.01; ***p<0.001. The sample consists of mothers with a child in the age six group (+/- six months of age six on Sept. 30) who have non-missing outcome data. "First" denotes the first-stage discontinuity in ECCE. N right denotes the number of observations to the right of the cutoff; N left denotes the number of observations to the left of the cutoff, and N (Obs.) is the total number of observations (sum of N left and N right).

An additional distinction is between care work as a primary or secondary activity. There are not significant FRDD results (Table 25 in the appendix). However, DID results (Table 6), show significant increases from ECCE in primary direct care and primary any care hours. Negative shifts, albeit smaller and insignificant, in secondary care hours for these outcomes suggest some substitution from ECCE.

Table 6. DID models of maternal outcomes, mothers with at least one child aged 6-8 versus mothers with only children aged under 6, primary versus secondary activities

	Direct care hrs.		Indirect care hrs.		Any care hrs.		Employment hrs.	
	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary
Moth. w/ kids (age 6-8)	-0.234*	-0.211	0.235	-0.017	0.001	-0.054	0.012	-0.016
	(0.118)	(0.125)	(0.155)	(0.057)	(0.183)	(0.102)	(0.122)	(0.012)
During school year	0.008	0.367***	0.255	-0.014	0.263	0.300***	-0.082	-0.019
	(0.101)	(0.106)	(0.132)	(0.049)	(0.157)	(0.087)	(0.104)	(0.010)
Moth. w/ kids (age 6-8)*During school year	0.331**	-0.100	0.124	-0.010	0.455*	-0.174	-0.007	0.016
	(0.126)	(0.134)	(0.166)	(0.061)	(0.196)	(0.109)	(0.130)	(0.013)
Constant	-0.014	0.057	1.999**	0.122	1.985*	0.243	2.655***	0.066
	(0.550)	(0.582)	(0.723)	(0.265)	(0.856)	(0.477)	(0.568)	(0.056)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Governorate*urban	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N (Obs.)	5971	5971	5971	5971	5971	5971	5971	5971

Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. The sample includes mothers with only children under age 6 and those whose youngest child is aged 6-8, with non-missing outcome data. The "primary" columns are their time use in primary activities, the "secondary" columns are their time use in secondary activities.

The effects of ECCE on maternal time use may vary based on mothers' and their spouses' gender norms. To investigate this, we analyze the effects of ECCE on maternal outcomes comparing mothers with equitable versus inequitable norms about caregiving and mothers whose spouses hold equitable versus inequitable norms. For differences among mothers with varying gender norms, the results from FRDD models (Table 26 in the appendix) indicate no significant differences in the effects of ECCE on maternal time use. In contrast, DID models (Table 7) show a significant 1.4 hour increase in indirect care from ECCE for mothers with inequitable gender norms, but no other significant differences. Additionally, results from FRDD models (Table 27 in the appendix) and DID models (Table 28) show no significant differences in the effects of ECCE across spouse norm groups.

Table 7. DID models of maternal outcomes, mothers with at least one child aged 6-8 versus mothers with only children aged under 6, mothers with equitable gender norms versus mothers with inequitable gender norms

	Direct care hrs.		Indirect care hrs.		Any care hrs.		Employment hrs.		Employed	
	Eq.	**Ineq.**	**Eq.**	**Ineq.**	**Eq.**	**Ineq.**	**Eq.**	**Ineq.**	**Eq.**	**Ineq.**
Moth. w/ kids (age 6-8)	-0.396*	-0.047	0.287	-1.095	0.030	-0.725	0.047	-0.498	0.046*	-0.057
	(0.181)	(0.572)	(0.165)	(0.576)	(0.212)	(0.715)	(0.133)	(0.318)	(0.021)	(0.057)
During school year	0.422**	0.499	0.277*	-0.489	0.594***	0.561	-0.087	-0.332	-0.004	-0.062
	(0.154)	(0.523)	(0.140)	(0.527)	(0.180)	(0.653)	(0.113)	(0.291)	(0.018)	(0.052)
Moth. w/ kids (age 6-8) * During school year	0.176	-0.021	0.055	1.360*	0.231	0.618	-0.035	0.500	-0.008	0.064
	(0.194)	(0.620)	(0.177)	(0.625)	(0.227)	(0.775)	(0.142)	(0.345)	(0.023)	(0.062)
Constant	0.059	-3.700	2.001**	6.701	2.128*	3.173	2.613***	3.221	0.451***	0.981*
	(0.826)	(4.254)	(0.753)	(4.284)	(0.967)	(5.314)	(0.605)	(2.366)	(0.102)	(0.422)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Governorate*urban	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N (Obs.)	5378	588	5378	588	5378	588	5378	588	5374	586

Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. Standard errors in parentheses. The sample includes mothers with only children under age 6 and those whose youngest child is aged 6-8, with non-missing outcome data. The "Eq." columns include mothers with equitable gender norms about caregiving, and the "Ineq." columns include mothers with inequitable gender norms about caregiving.

Further analyses in the appendix explore the potential heterogeneity in the effects of ECCE on maternal time use, considering distinctions by maternal education level (FRDD results (Table 29) and DID results (Table 30)), residential location (urban versus rural, FRDD (Table 31) and DID (Table 32)), and family structure (nuclear versus extended, FRDD (Table 33) and DID (Table 34)). The results indicate no statistically significant effects of ECCE on maternal time use across these dimensions. Overall, the heterogeneity analysis results do not show differential benefits when the youngest child reaches ECCE, nor by most dimensions of demographics, with the exception of mother's gender norms (DID). There is some suggestive evidence of shifts in care work between weekdays and weekends (FRDD), school and non-school hours (DID), into primary activities (DID) and between types of indirect care work (FRDD). However, these heterogenous impacts are not ever robust across both DID and FRDD, and a variety of analyses are undertaken, so should be considered suggestive at most.

5 Discussion and conclusions

Global gender disparities in unpaid care work have prompted calls for policies to redistribute this care work, including onto the market with services such as ECCE (International Labour Organization 2018). The expectation is that these services will reduce the time women spend in unpaid care work and increase women's employment. Past research has demonstrated that ECCE usually does, particularly in LMICs, increase women's employment rates and/or hours (Halim, Perova, and Reynolds 2023; Gelbach 2002; Swart, Van Den Berge, and Van Der Wiel 2019). Studies of ECCE's impact do not necessarily look at other impacts on women's time, such as whether time in unpaid care work actually decreases. However, some of the studies that do examine time use show ECCE decreasing unpaid care work (Angeles et al. 2012;

Calderón 2014; Fang and Miao 2024). For instance, a study of the impact of ECCE in Mexico showed it reduced mothers' time in child care while doing something else by 1.4 hours per day and additionally time spent exclusively on child care by 0.3 hours, while increasing employment by 18 percentage points and hours per week of employment by 7 hours, consistent with the weekly reduction in time spent in child care (Angeles et al. 2012).

This paper tested the impact of ECCE on maternal time use and employment in Egypt, using FRDD and DID designs for specifically primary school. These strategies' ability to identify the causal effects of ECCE rests on a number of assumptions. For FRDD, there does not appear to be manipulation of birth dates right around the cutoff, but children's ages are also not uniformly distributed. There is a very clear jump in ECCE at the cutoff, such that the identification strategy's first stage is strong. Because FRDD focuses on a local average treatment effect, impacts at other ages than age six could be different. The local nature of estimates, constrained to around the cutoff, can also limit statistical power. Although the first stage is strong, small impacts may not be detectable. The DID approach assumes trends between treatment and control groups would have been similar without ECCE. To ensure that interview timing around the school start date (September 30) did not introduce bias, we compared the characteristics of mothers and their spouses interviewed before and after this date. The results suggested minimal bias, beyond the geographic aspects of fieldwork, which we control for.

The results showed that in Egypt, ECCE, specifically children starting primary school, does not decrease time spent in unpaid care work, nor increase employment rates or hours of work.[18] There is some suggestive evidence that ECCE may slightly shift the timing or type of care work, but not care work or employment overall. The main results are robust to a variety of

alternative specifications and robustness checks, such as focusing on the youngest child in the household.

Several factors may be driving the lack of effect from ECCE. First, primary school days are short, and short hours of care have been shown to have null or negative effects on women's employment outcomes in some low-employment contexts (Medrano 2009; Krafft and Lassassi 2024; Mata 2024).[19] Lengthening the school day or providing after-school care could be an effective approach to support mothers' employment, as suggested by studies in other contexts (Berthelon et al. 2020; Cannon, Jacknowitz, and Painter 2006; Contreras and Sepúlveda 2017; Dhuey, Lamontagne, and Zhang 2019; Martínez A. and Perticará 2017). However, studies in other contexts with short days of care have still shown positive impacts (Berlinski and Galiani 2007; Swart, Van Den Berge, and Van Der Wiel 2019), so it may be particularly in contexts with low female employment rates that length of care matters (Medrano 2009; Krafft and Lassassi 2024), as with Egypt.

An important critique of research on early childhood development interventions in LMICs is that only 4% look at impacts on maternal labor market outcomes or time use, and furthermore that studies often value mother's time for such interventions at zero (Evans, Jakiela, and Knauer 2021). Given current gender divisions of care work, in Egypt ECCE may create additional work for mothers – as suggested by the descriptive evidence on additional direct care around drop off/pick up and after school, DID results around increased care in non-school hours, and DID results around increased primary direct care work. Similarly, in the U.S., in some cases ECCE led to parents spending additional time engaging with children (Gelber and Isen 2013), although they also increased maternal employment (Cascio and Schanzenbach 2013) and reduced care work (Gibbs, Wikle, and Wilson 2024).

While ECCE interventions seem to increase maternal employment and shift time use in LMICs outside of MENA (Halim, Perova, and Reynolds 2023), results in MENA to date have been less promising. Child care subsidies did not improve mother's employment outcomes in Egypt, nor did subsidies combined with employment services (Caria et al. 2022). In Algeria, a pre-primary expansion did not increase and appears to have even reduced maternal employment (Krafft and Lassassi 2024). Gender norms that identify women as homemakers and men as breadwinners (Hoodfar 1997; El-Feki, Heilman, and Barker 2017) may be underlying the ineffectiveness of ECCE interventions in improving maternal outcomes in MENA.

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Supplemental appendix: The impact of early childhood care and education on maternal time use in Egypt

Appendix: Additional Tables

Table 8. Means, differences, and t-tests for mother and spouse characteristics before or on versus after September 30th visit date among the mother group with at least one child aged 6-8

	Before or on Sep. 30th	After Sep. 30th	Pairwise t-test Mean difference
	Mean/(SE)	Mean/(SE)	
Mother's age group			
<25	0.037	0.030	0.006
	(0.006)	(0.003)	
25-29	0.274	0.246	0.028
	(0.015)	(0.008)	
30-34	0.296	0.317	-0.021
	(0.015)	(0.009)	
35-39	0.252	0.249	0.003
	(0.014)	(0.009)	
40-44	0.113	0.115	-0.002
	(0.011)	(0.006)	
45-49	0.023	0.036	-0.012
	(0.005)	(0.004)	
50+	0.004	0.007	-0.003
	(0.002)	(0.002)	
Mother's education			
Illiterate	0.167	0.184	-0.017
	(0.012)	(0.008)	
Reads & Writes	0.035	0.036	-0.001
	(0.006)	(0.004)	
Primary	0.075	0.068	0.007
	(0.009)	(0.005)	
Preparatory	0.123	0.112	0.011
	(0.011)	(0.006)	
General secondary	0.043	0.047	-0.004
	(0.007)	(0.004)	
Vocational secondary	0.364	0.362	0.002
	(0.016)	(0.009)	
Post-secondary institute	0.022	0.028	-0.006
	(0.005)	(0.003)	
University & above	0.170	0.162	0.008
	(0.013)	(0.007)	
Region			
Greater Cairo	0.027	0.055	-0.029***
	(0.005)	(0.005)	
Alexandria & Suez Canal	0.043	0.044	-0.001

	Before or on Sep. 30th	After Sep. 30th	Pairwise t-test Mean difference
	Mean/(SE)	Mean/(SE)	
	(0.007)	(0.004)	
Urban Lower Egypt	0.055	0.088	-0.033**
	(0.008)	(0.006)	
Urban Upper Egypt	0.105	0.153	-0.047***
	(0.010)	(0.007)	
Rural Lower Egypt	0.367	0.265	0.102***
	(0.016)	(0.009)	
Rural Upper Egypt	0.403	0.394	0.008
	(0.016)	(0.010)	
Ever married	0.978	0.964	0.014*
	(0.005)	(0.004)	
Spouse present	0.886	0.880	0.006
	(0.011)	(0.006)	
Spouse education			
Spouse absent/education missing	0.131	0.131	-0.001
	(0.011)	(0.007)	
Illiterate	0.126	0.139	-0.012
	(0.011)	(0.007)	
Reads & Writes	0.051	0.046	0.005
	(0.007)	(0.004)	
Primary	0.062	0.059	0.003
	(0.008)	(0.005)	
Preparatory	0.064	0.054	0.011
	(0.008)	(0.004)	
General secondary	0.027	0.028	-0.001
	(0.005)	(0.003)	
Vocational secondary	0.377	0.369	0.009
	(0.016)	(0.010)	
Post-secondary institute	0.014	0.017	-0.003
	(0.004)	(0.003)	
University & above	0.148	0.158	-0.009
	(0.012)	(0.007)	
Spouse age group			
Spouse absent/age missing	0.119	0.125	-0.005
	(0.011)	(0.007)	
<25	0.007	0.007	-0.001
	(0.003)	(0.002)	
25-29	0.032	0.027	0.005
	(0.006)	(0.003)	
30-34	0.175	0.179	-0.004

	Before or on Sep. 30th	After Sep. 30th	Pairwise t-test Mean difference
	Mean/(SE)	Mean/(SE)	
	(0.013)	(0.008)	
35-39	0.285	0.274	0.012
	(0.015)	(0.009)	
40-44	0.205	0.206	-0.002
	(0.013)	(0.008)	
45-49	0.118	0.109	0.009
	(0.011)	(0.006)	
50+	0.059	0.073	-0.014
	(0.008)	(0.005)	
N (obs.)	904	2577	3481

Source: Authors' calculations based on ELMPS 2023
Notes: *p<0.05; **p<0.01; ***p<0.001.

Table 9. Means, differences, and t-tests for mother and spouse characteristics before or on versus after September 30th among the mother group whose children are all under six as of September 30th

	Before or on Sep. 30th	After Sep. 30th	Pairwise t-test Mean difference
	Mean/(SE)	Mean/(SE)	
Mother's age group			
<25	0.411	0.438	-0.027
	(0.022)	(0.011)	
25-29	0.361	0.360	0.001
	(0.022)	(0.011)	
30-34	0.141	0.117	0.025
	(0.016)	(0.007)	
35-39	0.058	0.048	0.010
	(0.011)	(0.005)	
40-44	0.016	0.028	-0.012
	(0.006)	(0.004)	
45-49	0.010	0.005	0.005
	(0.004)	(0.002)	
50+	0.002	0.004	-0.002
	(0.002)	(0.001)	
Mother's education			
Illiterate	0.139	0.108	0.031*
	(0.016)	(0.007)	
Reads & Writes	0.010	0.022	-0.012
	(0.004)	(0.003)	
Primary	0.079	0.095	-0.017
	(0.012)	(0.007)	
Preparatory	0.147	0.130	0.018
	(0.016)	(0.007)	
General secondary	0.071	0.043	0.027*
	(0.012)	(0.005)	
Vocational secondary	0.331	0.334	-0.004
	(0.021)	(0.011)	
Post-secondary institute	0.012	0.035	-0.023**
	(0.005)	(0.004)	
University & above	0.212	0.233	-0.021
	(0.018)	(0.009)	
Region			
Greater Cairo	0.026	0.040	-0.013
	(0.007)	(0.004)	
Alexandria & Suez Canal	0.052	0.044	0.009
	(0.010)	(0.005)	
Urban Lower Egypt	0.046	0.088	-0.042**

	Before or on Sep. 30th	After Sep. 30th	Pairwise t-test Mean difference
	Mean/(SE)	Mean/(SE)	
	(0.009)	(0.006)	
Urban Upper Egypt	0.121	0.136	-0.016
	(0.015)	(0.008)	
Rural Lower Egypt	0.319	0.263	0.056*
	(0.021)	(0.010)	
Rural Upper Egypt	0.435	0.429	0.007
	(0.022)	(0.011)	
Ever married	0.988	0.977	0.011
	(0.005)	(0.003)	
Spouse present	0.907	0.881	0.026
	(0.013)	(0.007)	
Spouse education			
Spouse absent/education missing	0.109	0.129	-0.020
	(0.014)	(0.007)	
Illiterate	0.073	0.089	-0.016
	(0.012)	(0.006)	
Reads & Writes	0.020	0.031	-0.011
	(0.006)	(0.004)	
Primary	0.056	0.061	-0.004
	(0.010)	(0.005)	
Preparatory	0.069	0.058	0.010
	(0.011)	(0.005)	
General secondary	0.044	0.034	0.011
	(0.009)	(0.004)	
Vocational secondary	0.427	0.383	0.044
	(0.022)	(0.011)	
Post-secondary institute	0.024	0.026	-0.002
	(0.007)	(0.004)	
University & above	0.177	0.190	-0.013
	(0.017)	(0.009)	
Spouse age group			
Spouse absent/age missing	0.101	0.123	-0.022
	(0.014)	(0.007)	
<25	0.046	0.061	-0.015
	(0.009)	(0.005)	
25-29	0.222	0.271	-0.049*
	(0.019)	(0.010)	
30-34	0.373	0.319	0.054*
	(0.022)	(0.010)	
35-39	0.171	0.148	0.023

	Before or on Sep. 30th	After Sep. 30th	Pairwise t-test Mean difference
	Mean/(SE)	Mean/(SE)	
	(0.017)	(0.008)	
40-44	0.042	0.038	0.005
	(0.009)	(0.004)	
45-49	0.012	0.014	-0.002
	(0.005)	(0.003)	
50+	0.032	0.026	0.006
	(0.008)	(0.004)	
N (obs.)	496	2015	2511

Source: Authors' calculations based on ELMPS 2023
Notes: *p<0.05; **p<0.01; ***p<0.001.

Table 10. Means, differences, and t-tests for mother and spouse characteristics below versus above the age six cutoff, mothers with a child in the age six group

	Below cutoff	Above cutoff	Pairwise t-test
	Mean/(SE)	Mean/(SE)	Mean difference
Mother's age group			
<25	0.083	0.054	0.029*
	(0.012)	(0.008)	
25-29	0.250	0.278	-0.028
	(0.018)	(0.017)	
30-34	0.335	0.323	0.012
	(0.020)	(0.017)	
35-39	0.200	0.214	-0.014
	(0.017)	(0.015)	
40-44	0.090	0.091	-0.001
	(0.012)	(0.011)	
45-49	0.036	0.034	0.002
	(0.008)	(0.007)	
50+	0.005	0.005	-0.000
	(0.003)	(0.003)	
Mother's education			
Illiterate	0.176	0.175	0.001
	(0.016)	(0.014)	
Reads & Writes	0.047	0.030	0.017
	(0.009)	(0.006)	
Primary	0.077	0.072	0.004
	(0.011)	(0.010)	
Preparatory	0.122	0.117	0.004
	(0.014)	(0.012)	
General secondary	0.038	0.044	-0.005
	(0.008)	(0.008)	
Vocational secondary	0.375	0.372	0.003
	(0.020)	(0.018)	
Post-secondary institute	0.030	0.025	0.005
	(0.007)	(0.006)	
University & above	0.136	0.165	-0.029
	(0.014)	(0.014)	
Region			
Greater Cairo	0.054	0.052	0.002
	(0.009)	(0.008)	
Alexandria & Suez Canal	0.038	0.053	-0.015
	(0.008)	(0.008)	
Urban Lower Egypt	0.076	0.091	-0.015
	(0.011)	(0.011)	
Urban Upper Egypt	0.134	0.181	-0.048*

	Below cutoff	Above cutoff	Pairwise t-test Mean
	Mean/(SE)	Mean/(SE)	difference
	(0.014)	(0.014)	
Rural Lower Egypt	0.236	0.221	0.015
	(0.018)	(0.015)	
Rural Upper Egypt	0.462	0.402	0.060*
	(0.021)	(0.018)	
Ever married	0.955	0.963	-0.008
	(0.009)	(0.007)	
Spouse present	0.868	0.881	-0.013
	(0.014)	(0.012)	
Spouse education			
Spouse absent/education missing	0.146	0.128	0.018
	(0.015)	(0.012)	
Illiterate	0.109	0.134	-0.024
	(0.013)	(0.013)	
Reads & Writes	0.033	0.042	-0.009
	(0.007)	(0.007)	
Primary	0.071	0.067	0.004
	(0.011)	(0.009)	
Preparatory	0.049	0.050	-0.002
	(0.009)	(0.008)	
General secondary	0.016	0.033	-0.017
	(0.005)	(0.007)	
Vocational secondary	0.415	0.371	0.044
	(0.021)	(0.018)	
Post-secondary institute	0.016	0.014	0.002
	(0.005)	(0.004)	
University & above	0.146	0.162	-0.016
	(0.015)	(0.014)	
Spouse age group			
Spouse absent/age missing	0.137	0.123	0.015
	(0.014)	(0.012)	
<25	0.005	0.007	-0.002
	(0.003)	(0.003)	
25-29	0.056	0.042	0.013
	(0.010)	(0.007)	
30-34	0.198	0.221	-0.023
	(0.017)	(0.015)	
35-39	0.271	0.266	0.005
	(0.019)	(0.016)	
40-44	0.168	0.173	-0.005
	(0.016)	(0.014)	

	Below cutoff Mean/(SE)	Above cutoff Mean/(SE)	Pairwise t-test Mean difference
45-49	0.094 (0.012)	0.110 (0.012)	-0.017
50+	0.071 (0.011)	0.059 (0.009)	0.013
N (obs.)	576	734	1310

Source: Authors' calculations based on ELMPS 2023
Notes: *p<0.05; **p<0.01; ***p<0.001.

Table 11. Reduced form FRDD intercept, linear, and quadratic models, mothers with child in age six group

	Direct care hrs.			Ind. care hrs.			Any care hrs.			Emp hrs.			Employed		
	Intercept	Linear	Quadratic	Intercept	Linear	Quadratic	Intercept	Linear	Quadratic	Intercept	Linear	Quadratic	Intercept	Linear	Quadratic
Above cutoff	0.101	0.678*	0.252	-0.205	-0.415	-1.575**	-0.155	0.044	-1.229	-0.020	-0.196	-0.263	-0.007	-0.082	-0.158*
	(0.165)	(0.343)	(0.566)	(0.155)	(0.324)	(0.532)	(0.199)	(0.416)	(0.684)	(0.128)	(0.267)	(0.440)	(0.021)	(0.044)	(0.073)
Age in years from cutoff		-1.740*	3.475		0.540	10.607**		-0.383	11.697*		0.592	0.891		0.257*	1.165*
		(0.845)	(4.032)		(0.797)	(3.795)		(1.024)	(4.879)		(0.657)	(3.139)		(0.109)	(0.518)
Above cutoff # Age in years from cutoff		1.485	-6.242		-0.310	-9.058*		-0.026	-12.712*		-0.602	-0.278		-0.268	-1.586*
		(1.155)	(4.871)		(1.089)	(4.585)		(1.399)	(5.895)		(0.898)	(3.793)		(0.149)	(0.626)
Age in years from cutoff # Age in years from cutoff			8.994			17.362**			20.833*			0.517			1.567
			(6.799)			(6.399)			(8.227)			(5.293)			(0.874)
Above cutoff # Age in years from cutoff # Age in years from cutoff			-2.829			-20.599*			-19.346			-2.047			-0.560
			(9.354)			(8.804)			(11.319)			(7.282)			(1.202)
Constant	2.391***	1.866***	2.429***	5.503***	5.666***	6.754***	7.533***	7.418***	8.723***	0.803***	0.982***	1.014*	0.179***	0.257***	0.355***
	(0.123)	(0.283)	(0.512)	(0.116)	(0.267)	(0.482)	(0.149)	(0.343)	(0.619)	(0.096)	(0.220)	(0.398)	(0.016)	(0.037)	(0.066)
N (obs.)	1303	1303	1303	1303	1303	1303	1303	1303	1303	1303	1303	1303	1307	1307	1307
AIC	6519.4	6519.1	6520.4	6362.8	6366.2	6362.6	7016.1	7019.8	7017.3	5860.9	5864.1	5868.0	1184.7	1183.2	1182.5

Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. Standard errors in parentheses. Sample consists of mothers with a child in the age six group (+/- six months of age six on Sept. 30) who have non-missing outcome data.

Table 12. FRDD intercept models of maternal outcomes, mothers with a child in the age six group, half the bandwidth

	Direct care hrs.	Indirect care hrs.	Any care hrs.	Employment hrs.	Employed
ECCE	1.035	-1.049	-0.289	-0.285	-0.125
	(0.659)	(0.624)	(0.828)	(0.536)	(0.095)
First	0.348***	0.348***	0.348***	0.348***	0.348***
	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)
N (Obs.)	619	619	619	619	621
N right	373	373	373	373	375
N left	246	246	246	246	246

Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. Standard errors in parentheses. "First" denotes the first-stage discontinuity in pre-primary. Sample consists of mothers with a child in the age six group (+/- six months of age six on Sept. 30) who have non-missing outcome data within three (rather than six) months of the cutoff. N right denotes the number of observations to the right of the cutoff; N left denotes the number of observations to the left of the cutoff, and N (Obs.) is the total number of observations (sum of N left and N right).

Table 13. FRDD linear models of maternal outcomes, mothers with a child in the age six group

	Direct care hrs.	Indirect care hrs.	Any care hrs.	Employment hrs.	Employed
ECCE	3.202	-1.959	0.206	-0.926	-0.386
	(1.737)	(1.525)	(1.972)	(1.293)	(0.239)
First	0.212***	0.212***	0.212***	0.212***	0.213***
	(0.048)	(0.048)	(0.048)	(0.048)	(0.048)
N (Obs.)	1303	1303	1303	1303	1307
N right	730	730	730	730	732
N left	573	573	573	573	575

Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. Standard errors in parentheses. Sample consists of mothers with a child in the age six group (+/- six months of age six on Sept. 30) who have non-missing outcome data. "First" denotes the first-stage discontinuity in ECCE. N right denotes the number of observations to the right of the cutoff; N left denotes the number of observations to the left of the cutoff, and N (Obs.) is the total number of observations (sum of N left and N right).

Table 14. FRDD quadratic models of maternal outcomes, mothers with a child in the age six group

	Direct care hrs.	Indirect care hrs.	Any care hrs.	Employment hrs.	Employed
ECCE	15.926	-99.509	-77.620	-16.594	-12.053
	(92.052)	(518.618)	(405.215)	(93.783)	(75.858)
First	0.016	0.016	0.016	0.016	0.013
	(0.083)	(0.083)	(0.083)	(0.083)	(0.083)
N (Obs.)	1303	1303	1303	1303	1307
N right	730	730	730	730	732
N left	573	573	573	573	575

Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. Standard errors in parentheses. Sample consists of mothers with a child in the age six group (+/- six months of age six on Sept. 30) who have non-missing outcome data. "First" denotes the first-stage discontinuity in ECCE. N right denotes the number of observations to the right of the cutoff; N left denotes the number of observations to the left of the cutoff, and N (Obs.) is the total number of observations (sum of N left and N right).

Table 15. 2SLS FRDD intercept models of maternal outcomes, mothers with a child in the age six group

	Direct care hrs.	Indirect care hrs.	Any care hrs.	Employment hrs.	Employed
ECCE	0.190	-0.386	-0.292	-0.037	-0.013
	(0.309)	(0.291)	(0.375)	(0.239)	(0.040)
Constant	2.312***	5.664***	7.655***	0.818***	0.185***
	(0.233)	(0.221)	(0.285)	(0.178)	(0.031)
First stage					
Above cutoff	0.531***	0.531***	0.531***	0.531***	0.532***
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
Constant	0.417***	0.417***	0.417***	0.417***	0.416***
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
N (Obs.)	1303	1303	1303	1303	1307
p-val. for chi H0: exog.	0.338	0.590	0.703	0.334	0.430
p-val. for F-test H0: exog.	0.339	0.591	0.703	0.334	0.431
Partial r-sq.	0.340	0.340	0.340	0.340	0.342
F-stat. first	571.984	571.984	571.984	571.984	578.077
p-val F test	0.000	0.000	0.000	0.000	0.000

Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. Robust standard errors in parentheses. Sample consists of mothers with a child in the age six group (+/- six months of age six on Sept. 30) who have non-missing outcome data.

Table 16. FRDD intercept models of maternal outcomes, mothers with a child in the age six group, including controls

	Direct care hrs.	Indirect care hrs.	Any care hrs.	Employment hrs.	Employed
ECCE	0.169	-0.373	-0.292	-0.097	-0.018
	(0.301)	(0.286)	(0.367)	(0.231)	(0.038)
First	0.526***	0.526***	0.526***	0.526***	0.527***
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
N (Obs.)	1303	1303	1303	1303	1305
N right	730	730	730	730	731
N left	573	573	573	573	574

Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. Standard errors in parentheses. The sample consists of mothers with a child in the age six group (+/- six months of age six on Sept. 30) who have non-missing outcome data. "First" denotes the first-stage discontinuity in pre-primary. N right denotes the number of observations to the right of the cutoff; N left denotes the number of observations to the left of the cutoff, and N (Obs.) is the total number of observations (sum of N left and N right). Controls are: age group, education level, ever married, spouse present, region, education of spouse, and age group of spouse (see Table 10).

Table 17. DID models of maternal outcomes, without controls, mothers with at least one child aged 6-8 versus mothers with only children aged under 6

	Direct care hrs.	Indirect care hrs.	Any care hrs.	Employment hrs.	Employed
Moth. w/ kids (age 6-8)	-0.707***	0.269	-0.188	0.256*	0.082***
	(0.166)	(0.155)	(0.198)	(0.119)	(0.019)
During school year	0.423**	0.231	0.532**	-0.006	0.003
	(0.149)	(0.139)	(0.177)	(0.107)	(0.017)
Moth. w/ kids (age 6-8)*During school year	0.191	0.116	0.290	-0.050	-0.016
	(0.189)	(0.175)	(0.224)	(0.135)	(0.022)
Constant	2.414***	4.804***	6.747***	0.524***	0.099***
	(0.134)	(0.124)	(0.159)	(0.096)	(0.016)
N (Obs.)	5973	5973	5973	5973	5982

Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. Standard errors in parentheses. The sample consists of mothers with only children under age 6 and those with at least one child aged 6-8 who have non-missing outcome data.

Table 18. DID models of maternal outcomes, mothers with at least one child aged 6-11 versus mothers with only children aged under 6

	Direct care hrs.	Indirect care hrs.	Any care hrs.	Employment hrs.	Employed
Moth. w/ kids (age 6-11)	-0.412**	0.267	0.002	-0.043	0.043*
	(0.150)	(0.149)	(0.187)	(0.124)	(0.019)
During school year	0.359**	0.224	0.526**	-0.089	-0.004
	(0.137)	(0.137)	(0.171)	(0.114)	(0.018)
Moth. w/ kids (age 6-11)*During school year	0.146	0.078	0.221	0.137	-0.009
	(0.157)	(0.157)	(0.196)	(0.130)	(0.020)
Constant	0.405	2.772***	3.171***	2.984***	0.452***
	(0.548)	(0.545)	(0.682)	(0.454)	(0.071)
Controls	Yes	Yes	Yes	Yes	Yes
Governorate*urban	Yes	Yes	Yes	Yes	Yes
N (Obs.)	8892	8892	8892	8892	8909

Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. Standard errors in parentheses.

The sample consists of mothers with only children under age 6 and those with at least one child aged 6-11 who have non-missing outcome data.

Table 19. DID models of maternal outcomes, mothers with at least one child aged 6-17 versus mothers with only children aged under 6

	Direct care hrs.	Indirect care hrs.	Any care hrs.	Employment hrs.	Employed
Moth. w/ kids (age 6-17)	-0.369**	0.254	0.027	-0.064	0.043*
	(0.139)	(0.147)	(0.181)	(0.129)	(0.019)
During school year	0.355**	0.220	0.511**	-0.093	-0.005
	(0.130)	(0.137)	(0.170)	(0.121)	(0.018)
Moth. w/ kids (age 6-17)*During school year	0.023	0.074	0.111	0.207	-0.003
	(0.144)	(0.153)	(0.188)	(0.134)	(0.020)
Constant	0.005	2.715***	2.821***	3.366***	0.504***
	(0.436)	(0.461)	(0.569)	(0.405)	(0.061)
Controls	Yes	Yes	Yes	Yes	Yes
Governorate*urban	Yes	Yes	Yes	Yes	Yes
N (Obs.)	11146	11146	11146	11146	11162

Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. Standard errors in parentheses. The sample consists of mothers with only children under age 6 and those with at least one child aged 6-17 who have non-missing outcome data.

Table 20. FRDD intercept models of maternal outcomes, mothers with a child in the age six group, child in the age six group is her youngest child

	Direct care hrs.	Indirect care hrs.	Any care hrs.	Employment hrs.	Employed
ECCE	-0.436	-0.441	-0.670	-0.359	-0.046
	(0.356)	(0.421)	(0.525)	(0.386)	(0.060)
First	0.537***	0.537***	0.537***	0.537***	0.540***
	(0.031)	(0.031)	(0.031)	(0.031)	(0.030)
N (Obs.)	602	602	602	602	606
N right	317	317	317	317	319
N left	285	285	285	285	287

Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. Sample includes mothers with a child in the age six group (+/- six months of age six on Sept. 30), where the child in the age six group is the youngest in the household, with non-missing outcome data. "First" denotes the first-stage discontinuity in ECCE. N right denotes the number of observations to the right of the cutoff; N left denotes the number of observations to the left of the cutoff, and N (Obs.) is the total number of observations (sum of N left and N right).

Table 21. DID models of maternal outcomes, mothers with at least one child aged 6-8 where the child aged 6-8 is her youngest child versus mothers with only children aged under 6

	Direct care hrs.	Indirect care hrs.	Any care hrs.	Employment hrs.	Employed
Moth. w/ kids (age 6-8)	-0.532*	0.325	-0.030	0.001	0.056*
	(0.227)	(0.195)	(0.253)	(0.140)	(0.023)
During school year	0.387*	0.249	0.585***	-0.112	-0.010
	(0.157)	(0.135)	(0.175)	(0.097)	(0.016)
Moth. w/ kids (age 6-8)*During school year	0.496	-0.149	0.265	-0.045	-0.027
	(0.255)	(0.219)	(0.285)	(0.158)	(0.026)
Constant	-0.086	0.768	0.797	2.471***	0.504***
	(1.025)	(0.881)	(1.144)	(0.633)	(0.111)
Controls	Yes	Yes	Yes	Yes	Yes
Governorate*urban	Yes	Yes	Yes	Yes	Yes
N (Obs.)	3688	3688	3688	3688	3691

Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. Standard errors in parentheses. The sample includes mothers with only children under age 6 and those whose youngest child is aged 6-8, with non-missing outcome data.

Table 22. DID models of maternal outcomes, mothers with at least one child aged 6-8 versus mothers with only children aged under 6, weekday versus weekend time use

	Direct care hrs.		Indirect care hrs.		Any care hrs.		Employment hrs.	
	Weekday	Weekend	Weekday	Weekend	Weekday	Weekend	Weekday	Weekend
Moth. w/ kids (age 6-8)	-0.552*	-0.236	0.140	0.344	-0.192	0.201	0.041	-0.050
	(0.224)	(0.273)	(0.203)	(0.264)	(0.260)	(0.332)	(0.162)	(0.187)
During school year	0.300	0.457	0.240	0.238	0.517*	0.619*	-0.086	-0.213
	(0.186)	(0.246)	(0.169)	(0.238)	(0.216)	(0.300)	(0.135)	(0.168)
Moth. w/ kids (age 6-8)*During school year	0.351	0.012	0.134	0.144	0.417	0.056	-0.035	0.077
	(0.237)	(0.305)	(0.215)	(0.295)	(0.275)	(0.371)	(0.171)	(0.208)
Constant	0.358	-0.123	2.991***	-2.175	3.289**	-2.016	2.623***	3.304*
	(0.931)	(1.976)	(0.845)	(1.915)	(1.082)	(2.407)	(0.673)	(1.351)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Governorate*urban	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N (Obs.)	4163	1808	4163	1808	4163	1808	4163	1808

Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. The "weekday" sample consists of mothers with only children under age 6 and those with at least one child aged 6-8 who completed the time use diary for a weekday, with non-missing outcome data. The "weekend" sample includes mothers with only children under age 6 and those with at least one child aged 6-8 who completed the time use diary for a weekend day (Friday–Saturday), also with non-missing outcome data.

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Table 23. FRDD intercept models of maternal outcomes, mothers with a child in the age six group, school versus non-school hours

	Direct care hrs.		Indirect care hrs.		Any care hrs.		Employment hrs.	
	School	**Non-school**	**School**	**Non-school**	**School**	**Non-school**	**School**	**Non-school**
ECCE	0.113	0.359	-0.019	0.155	0.094	0.514	-0.202	0.048
	(0.153)	(0.414)	(0.205)	(0.416)	(0.246)	(0.591)	(0.140)	(0.185)
First	0.520***	0.533***	0.520***	0.533***	0.520***	0.533***	0.520***	0.533***
	(0.025)	(0.021)	(0.025)	(0.021)	(0.025)	(0.021)	(0.025)	(0.021)
N (Obs.)	933	1310	933	1310	933	1310	933	1310
N right	518	734	518	734	518	734	518	734
N left	415	576	415	576	415	576	415	576

Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. Standard errors in parentheses. The "school" columns include mothers with a child in the age six group (+/- six months of age six on Sept. 30) and their time during school hours (8:00 am–12:15 pm, Sunday–Thursday), with non-missing outcome data. The "non-school" columns consist of the time use of mothers with a child in the age six group (+/- six months of age six on Sept. 30) outside of school hours, including Friday–Saturday and non-school hours on Sunday–Thursday. "First" denotes the first-stage discontinuity in ECCE. N right denotes the number of observations to the right of the cutoff; N left denotes the number of observations to the left of the cutoff, and N (Obs.) is the total number of observations (sum of N left and N right).

Table 24. DID models of maternal outcomes, mothers with at least one child aged 6-8 versus mothers with only children aged under 6, different types of indirect care activities

	Food	Cleaning	Shopping	Travel	Other indirect
Moth. w/ kids (age 6-8)	0.107	0.007	0.034	0.008	0.054
	(0.096)	(0.104)	(0.055)	(0.025)	(0.086)
During school year	0.145	-0.125	0.008	0.018	0.231**
	(0.082)	(0.089)	(0.047)	(0.021)	(0.074)
Moth. w/ kids (age 6-8)*During school year	-0.046	0.170	0.045	-0.030	-0.018
	(0.102)	(0.111)	(0.059)	(0.027)	(0.093)
Constant	0.698	0.854	0.670**	-0.140	-0.177
	(0.446)	(0.486)	(0.256)	(0.116)	(0.403)
Controls	Yes	Yes	Yes	Yes	Yes
Governorate*urban	Yes	Yes	Yes	Yes	Yes
N (Obs.)	5971	5971	5971	5971	5971

Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. Standard errors in parentheses. The sample includes mothers with only children under age 6 and those whose youngest child is aged 6-8, with non-missing outcome data.

Table 25. FRDD intercept models of maternal outcomes, mothers with a child in the age six group, primary versus secondary activities

	Direct care hrs.		Indirect care hrs.		Any care hrs.		Employment hrs.	
	Primary	**Secondary**	**Primary**	**Secondary**	**Primary**	**Secondary**	**Primary**	**Secondary**
ECCE	-0.049	0.239	-0.252	-0.135	-0.301	0.009	-0.002	-0.035
	(0.223)	(0.208)	(0.281)	(0.098)	(0.341)	(0.173)	(0.237)	(0.020)
First	0.531***	0.531***	0.531***	0.531***	0.531***	0.531***	0.531***	0.531***
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
N (Obs.)	1303	1303	1303	1303	1303	1303	1303	1303
N right	730	730	730	730	730	730	730	730
N left	573	573	573	573	573	573	573	573

Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. Standard errors in parentheses. The sample consists of mothers with a child in the age six group (+/- six months of age six on Sept. 30) who have non-missing outcome data. The "primary" columns are their time use in primary activities, the "secondary" columns are their time use in secondary activities. "First" denotes the first-stage discontinuity in ECCE. N right denotes the number of observations to the right of the cutoff; N left denotes the number of observations to the left of the cutoff, and N (Obs.) is the total number of observations (sum of N left and N right).

Table 26. FRDD intercept models of maternal outcomes, mothers with a child in the age six group, mothers with equitable gender norms versus mothers with inequitable gender norms

	Direct care hrs.		Indirect care hrs.		Any care hrs.		Employment hrs.		Employed	
	Eq.	**Ineq.**	**Eq.**	**Ineq.**	**Eq.**	**Ineq.**	**Eq.**	**Ineq.**	**Eq.**	**Ineq.**
ECCE	0.041	1.621	-0.442	0.055	-0.474	1.373	0.000	-0.279	-0.001	-0.120
	(0.321)	(1.065)	(0.305)	(0.938)	(0.395)	(1.143)	(0.258)	(0.548)	(0.043)	(0.104)
First	0.529***	0.550***	0.529***	0.550***	0.529***	0.550***	0.529***	0.550***	0.530***	0.550***
	(0.022)	(0.074)	(0.022)	(0.074)	(0.022)	(0.074)	(0.022)	(0.074)	(0.022)	(0.074)
N (Obs.)	1181	121	1181	121	1181	121	1181	121	1182	120
N right	657	72	657	72	657	72	657	72	657	71
N left	524	49	524	49	524	49	524	49	525	49

Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. Standard errors in parentheses.

The sample consists of mothers with a child in the age six group (+/- six months of age six on Sept. 30) who have non-missing outcome data. The "Eq." columns include mothers with equitable gender norms about caregiving, the "Ineq." columns include mothers with inequitable gender norms about caregiving. "First" denotes the first-stage discontinuity in ECCE. N right denotes the number of observations to the right of the cutoff; N left denotes the number of observations to the left of the cutoff, and N (Obs.) is the total number of observations (sum of N left and N right).

Table 27. FRDD intercept models of maternal outcomes, mothers with a child in the age six group, mothers' spouses with equitable gender norms versus mothers' spouses with inequitable gender norms

	Direct care hrs.		Indirect care hrs.		Any care hrs.		Employment hrs.		Employed	
	Eq.	**Ineq.**	**Eq.**	**Ineq.**	**Eq.**	**Ineq.**	**Eq.**	**Ineq.**	**Eq.**	**Ineq.**
ECCE	0.259	0.453	-0.391	-0.718	-0.271	-0.473	0.079	-0.048	0.000	-0.038
	(0.372)	(0.795)	(0.352)	(0.824)	(0.460)	(0.996)	(0.308)	(0.418)	(0.051)	(0.082)
First	0.511***	0.546***	0.511***	0.546***	0.511***	0.546***	0.511***	0.546***	0.511***	0.546***
	(0.026)	(0.055)	(0.026)	(0.055)	(0.026)	(0.055)	(0.026)	(0.055)	(0.026)	(0.055)
N (Obs.)	917	204	917	204	917	204	917	204	919	203
N right	523	112	523	112	523	112	523	112	525	111
N left	394	92	394	92	394	92	394	92	394	92

Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. Standard errors in parentheses. The sample consists of mothers with a child in the age six group (+/- six months of age six on Sept. 30) who have non-missing outcome data. The "Eq." columns include mothers' spouses with equitable gender norms about caregiving, the "Ineq." columns include mothers' spouses with inequitable gender norms about caregiving. "First" denotes the first-stage discontinuity in ECCE. N right denotes the number of observations to the right of the cutoff; N left denotes the number of observations to the left of the cutoff, and N (Obs.) is the total number of observations (sum of N left and N right).

Table 28. DID models of maternal outcomes, mothers with at least one child aged 6-8 versus mothers with only children aged under 6, mother's spouse with equitable gender norms versus mother's spouse with inequitable gender norms

	Direct care hrs.		Indirect care hrs.		Any care hrs.		Employment hrs.		Employed	
	Eq.	**Ineq.**	**Eq.**	**Ineq.**	**Eq.**	**Ineq.**	**Eq.**	**Ineq.**	**Eq.**	**Ineq.**
Moth. w/ kids (age 6-8)	-0.503*	-0.708	0.131	0.702	-0.192	0.119	0.174	-0.253	0.042	0.030
	(0.210)	(0.396)	(0.188)	(0.421)	(0.243)	(0.517)	(0.154)	(0.198)	(0.024)	(0.040)
During school year	0.348*	0.208	0.203	0.267	0.474*	0.448	0.078	-0.192	-0.002	0.031
	(0.175)	(0.357)	(0.157)	(0.379)	(0.203)	(0.465)	(0.129)	(0.178)	(0.020)	(0.036)
Moth. w/ kids (age 6-8) * During school year	0.236	0.665	0.162	-0.174	0.355	0.382	-0.177	0.243	-0.007	0.001
	(0.224)	(0.426)	(0.201)	(0.453)	(0.259)	(0.556)	(0.165)	(0.212)	(0.026)	(0.043)
Constant	0.097	3.232*	3.283***	3.470*	3.110***	6.193**	0.899	1.439	0.269**	0.234
	(0.714)	(1.607)	(0.640)	(1.707)	(0.827)	(2.096)	(0.525)	(0.801)	(0.089)	(0.181)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Governorate*urban	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N (Obs.)	4197	983	4197	983	4197	983	4197	983	4201	984

Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. Standard errors in parentheses. The sample includes mothers with only children under age 6 and those whose youngest child is aged 6-8, with non-missing outcome data. The "Eq." columns include mothers' spouse with equitable gender norms about caregiving, and the "Ineq." columns include mothers' spouse with inequitable gender norms about caregiving.

Table 29. FRDD intercept models of maternal outcomes, mothers with a child in the age six group, by mother's education

	Direct care hrs.		Indirect care hrs.		Any care hrs.		Employment hrs.		Employed	
	Int. +	**<Int.**	**Int. +**	**<Int.**	**Int. +**	**<Int.**	**Int. +**	**<Int.**	**Int. +**	**<Int.**
ECCE	0.622	-0.355	-0.635	-0.012	-0.085	-0.514	0.001	-0.134	-0.029	0.001
	(0.395)	(0.490)	(0.385)	(0.446)	(0.490)	(0.582)	(0.362)	(0.284)	(0.058)	(0.054)
First	0.502***	0.568***	0.502***	0.568***	0.502***	0.568***	0.502***	0.568***	0.504***	0.568***
	(0.028)	(0.033)	(0.028)	(0.033)	(0.028)	(0.033)	(0.028)	(0.033)	(0.028)	(0.033)
N (Obs.)	773	530	773	530	773	530	773	530	774	531
N right	442	288	442	288	442	288	442	288	442	289
N left	331	242	331	242	331	242	331	242	332	242

Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. Standard errors in parentheses. The sample consists of mothers with a child in the age six group (+/- six months of age six on Sept. 30) who have non-missing outcome data. The "Int. +" columns include mothers whose education level is intermediate or above. The "<Int." columns include mothers whose education level is below intermediate. "First" denotes the first-stage discontinuity in ECCE. N right denotes the number of observations to the right of the cutoff; N left denotes the number of observations to the left of the cutoff, and N (Obs.) is the total number of observations (sum of N left and N right).

Table 30. DID models of maternal outcomes, mothers with at least one child aged 6-8 versus mothers with only children aged under 6, by mother's education

	Direct care hrs.		Indirect care hrs.		Any care hrs.		Employment hrs.		Employed	
	Int. +	<Int.	Int. +	<Int.	Int. +	<Int.	Int. +	<Int.	Int. +	<Int.
Moth. w/ kids (age 6-8)	-0.347	-0.525	0.209	0.265	0.069	-0.152	-0.064	0.009	0.018	0.055
	(0.218)	(0.286)	(0.200)	(0.268)	(0.256)	(0.340)	(0.174)	(0.161)	(0.027)	(0.029)
During school year	0.256	0.650**	0.327	0.072	0.613**	0.520	0.027	-0.325*	-0.001	-0.024
	(0.183)	(0.251)	(0.167)	(0.234)	(0.214)	(0.298)	(0.146)	(0.141)	(0.023)	(0.025)
Moth. w/ kids (age 6-8)*During school year	0.239	0.103	-0.032	0.373	0.091	0.516	-0.004	0.065	0.003	-0.005
	(0.232)	(0.310)	(0.212)	(0.290)	(0.272)	(0.368)	(0.185)	(0.174)	(0.029)	(0.032)
Constant	-0.874	0.675	3.620***	1.316	2.997*	2.205	3.297***	1.250	0.590***	0.181
	(1.141)	(1.273)	(1.043)	(1.191)	(1.337)	(1.512)	(0.909)	(0.715)	(0.149)	(0.134)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Governorate*urban	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N (Obs.)	3683	2288	3683	2288	3683	2288	3683	2288	3690	2290

Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. Standard errors in parentheses. The sample includes mothers with only children under age 6 and those whose youngest child is aged 6-8, with non-missing outcome data. "Int. +" columns include mothers whose education level is intermediate or above. The "<Int." columns include mothers whose education level is below intermediate.

Table 31. FRDD intercept models of maternal outcomes, mothers with a child in the age six group, urban versus rural

	Direct care hrs.		Indirect care hrs.		Any care hrs.		Employment hrs.		Employed	
	Urban	**Rural**	**Urban**	**Rural**	**Urban**	**Rural**	**Urban**	**Rural**	**Urban**	**Rural**
ECCE	0.158	0.157	-0.365	-0.315	-0.517	-0.161	-0.030	-0.034	-0.003	-0.006
	(0.562)	(0.371)	(0.522)	(0.356)	(0.726)	(0.443)	(0.479)	(0.276)	(0.070)	(0.049)
First	0.481***	0.552***	0.481***	0.552***	0.481***	0.552***	0.481***	0.552***	0.481***	0.554***
	(0.037)	(0.026)	(0.037)	(0.026)	(0.037)	(0.026)	(0.037)	(0.026)	(0.037)	(0.026)
N (Obs.)	449	854	449	854	449	854	449	854	450	857
N right	276	454	276	454	276	454	276	454	277	455
N left	173	400	173	400	173	400	173	400	173	402

Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. Standard errors in parentheses. The sample consists of mothers with a child in the age six group (+/- six months of age six on Sept. 30) who have non-missing outcome data. The "urban" columns include mothers living in urban areas. The "rural" columns include mothers living in urban areas. N right denotes the number of observations to the right of the cutoff; N left denotes the number of observations to the left of the cutoff, and N (Obs.) is the total number of observations (sum of N left and N right).

Table 32. DID models of maternal outcomes, mothers with at least one child aged 6-8 versus mothers with only children aged under 6, urban versus rural

	Direct care hrs.		Indirect care hrs.		Any care hrs.		Employment hrs.		Employed	
	Urban	**Rural**	**Urban**	**Rural**	**Urban**	**Rural**	**Urban**	**Rural**	**Urban**	**Rural**
Moth. w/ kids (age 6-8)	-0.361	-0.475*	-0.103	0.344	-0.433	0.082	-0.305	0.105	0.037	0.042
	(0.334)	(0.202)	(0.291)	(0.191)	(0.381)	(0.241)	(0.271)	(0.135)	(0.040)	(0.023)
During school year	0.264	0.425*	-0.204	0.395*	-0.005	0.767***	-0.425	-0.015	-0.031	-0.001
	(0.279)	(0.174)	(0.243)	(0.164)	(0.319)	(0.207)	(0.227)	(0.116)	(0.034)	(0.020)
Moth. w/ kids (age 6-8)*During school year	0.299	0.187	0.396	0.020	0.731	0.127	0.215	-0.040	-0.025	0.003
	(0.354)	(0.218)	(0.309)	(0.206)	(0.404)	(0.260)	(0.288)	(0.146)	(0.043)	(0.025)
Constant	-0.361	-0.475*	-0.103	0.344	-0.433	0.082	-0.305	0.105	0.037	0.042
	(0.334)	(0.202)	(0.291)	(0.191)	(0.381)	(0.241)	(0.271)	(0.135)	(0.040)	(0.023)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Governorate	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N (Obs.)	1819	4152	1819	4152	1819	4152	1819	4152	1821	4159

Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. Standard errors in parentheses. The sample includes mothers with only children under age 6 and those whose youngest child is aged 6-8, with non-missing outcome data. The "urban" columns include mothers living in urban areas. The "rural" columns include mothers living in urban areas.

Table 33. FRDD intercept models of maternal outcomes, mothers with a child in the age six group, nuclear versus extended families

	Direct care hrs.		Indirect care hrs.		Any care hrs.		Employment hrs.		Employed	
	Nuclear	**Extended**	**Nuclear**	**Extended**	**Nuclear**	**Extended**	**Nuclear**	**Extended**	**Nuclear**	**Extended**
ECCE	0.117	0.634	-0.577	0.881	-0.537	1.324	-0.000	-0.256	-0.005	-0.069
	(0.331)	(0.865)	(0.313)	(0.797)	(0.402)	(1.046)	(0.258)	(0.649)	(0.043)	(0.112)
First	0.525***	0.569***	0.525***	0.569***	0.525***	0.569***	0.525***	0.569***	0.527***	0.569***
	(0.023)	(0.059)	(0.023)	(0.059)	(0.023)	(0.059)	(0.023)	(0.059)	(0.023)	(0.059)
N (Obs.)	1135	168	1135	168	1135	168	1135	168	1140	167
N right	632	98	632	98	632	98	632	98	635	97
N left	503	70	503	70	503	70	503	70	505	70

Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. Standard errors in parentheses. The sample consists of mothers with a child in the age six group (+/- six months of age six on Sept. 30) who have non-missing outcome data. The "nuclear" columns include mothers whose families include a husband, wife, and their children only. The "extended" columns include mothers whose families include additional members beyond the husband, wife, and children. N right denotes the number of observations to the right of the cutoff; N left denotes the number of observations to the left of the cutoff, and N (Obs.) is the total number of observations (sum of N left and N right).

Table 34. DID models of maternal outcomes, mothers with at least one child aged 6-8 versus mothers with only children aged under 6, nuclear versus extended families

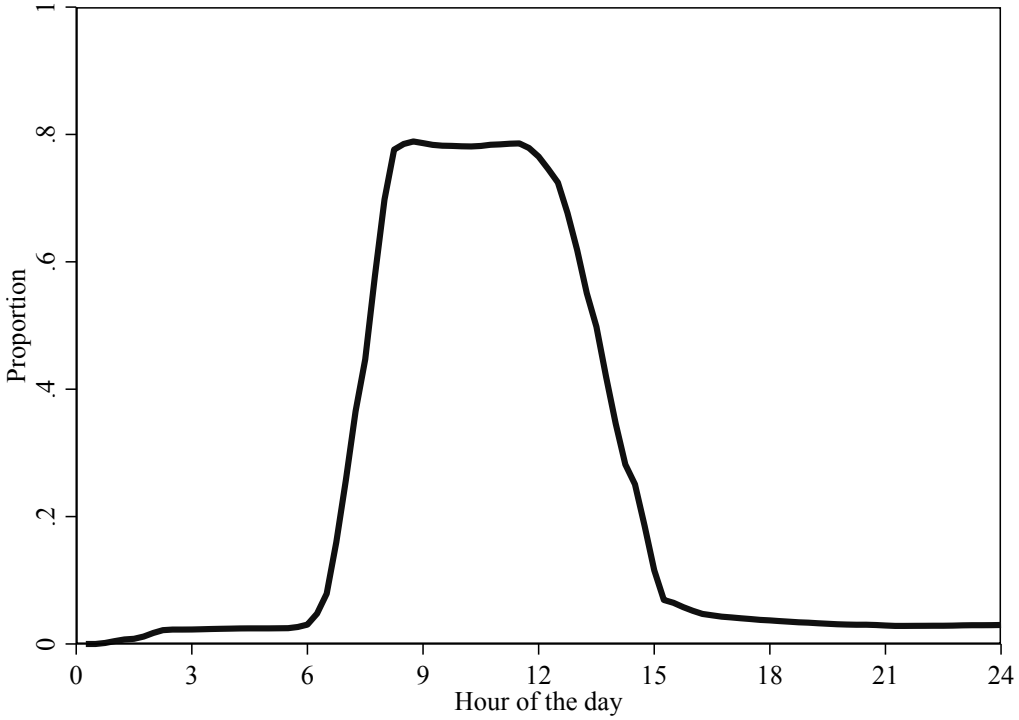
	Direct care hrs.		Indirect care hrs.		Any care hrs.		Employment hrs.		Employed	
	Nuclear	Extended	Nuclear	Extended	Nuclear	Extended	Nuclear	Extended	Nuclear	Extended
Moth. w/ kids (age 6-8)	-0.482**	-0.313	0.145	0.519	-0.186	0.619	0.030	-0.113	0.051*	-0.029
	(0.181)	(0.563)	(0.170)	(0.482)	(0.215)	(0.637)	(0.131)	(0.359)	(0.021)	(0.060)
During school year	0.372*	0.534	0.227	0.014	0.526**	0.657	-0.045	-0.288	0.005	-0.059
	(0.156)	(0.464)	(0.146)	(0.397)	(0.185)	(0.524)	(0.113)	(0.296)	(0.018)	(0.049)
Moth. w/ kids (age 6-8)*During school year	0.222	0.286	0.104	0.436	0.297	0.416	-0.005	-0.123	-0.015	0.046
	(0.195)	(0.599)	(0.182)	(0.513)	(0.231)	(0.676)	(0.141)	(0.382)	(0.023)	(0.063)
Constant	0.450	-1.017	3.298***	-2.160	3.539**	-2.694	3.676***	2.675	0.620***	0.447
	(0.960)	(2.740)	(0.898)	(2.347)	(1.139)	(3.096)	(0.696)	(1.748)	(0.113)	(0.297)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Governorate*urban	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N (Obs.)	5204	767	5204	767	5204	767	5204	767	5216	764

Source: Authors' calculations based on ELMPS 2023

Notes: *p<0.05; **p<0.01; ***p<0.001. Standard errors in parentheses. The sample includes mothers with only children under age 6 and those whose youngest child is aged 6-17, with non-missing outcome data. The "nuclear" columns include mothers whose families include a husband, wife, and their children only. The "extended" columns include mothers whose families include additional members beyond the husband, wife, and children.

Appendix: Additional Figures

Figure 7. Proportion of time spent on formal instruction in school, children aged 10+ currently enrolled in primary school



Source: Authors' calculations based on ELMPS 2023

[1] Key labor market statistics have been validated against other nationally representative, cross-sectional sources each wave (Assaad and Krafft 2013; Krafft, Assaad, and Rahman 2021; Assaad and Krafft 2024).

[2] There is thus a small group of respondents who were not yet aged six when fielded (fielding started September 15, 2023) but turned six by September 30 for whom we do not know if they enrolled in primary school, since they were not asked those questions. Since the vast majority of children start school on time in Egypt, analyses assume these children did as well and are in primary. Likewise, there is a large group of children who were not age six on September 30, 2023, and were still under six when interviewed subsequently, so were not asked the enrollment questions. Analyses assume they were not enrolled in primary, as they would not have been eligible. Data are available on their pre-primary enrollment from the roster.

[3] Fieldwork began September 15, 2023 (Assaad and Krafft 2024) and 75% of the sample was fielded in October or later.

[4] In the rare instance a mother has more than one child in the age six group (aged 5.5-6.5), which was mostly twins with the same ECCE status, the youngest or lowest ranked in the roster was used when mapping.

[5] Initial analyses also explored whether there were discontinuities at age four or age five, but there were not.

[6] Estimated using rdrobust (Calonico, Cattaneo, and Titiunik 2014).

[7] $After = 1$ if the first interview was conducted after September 30th, and $After = 0$ if it was conducted on or before this date.

[8] $Eligible = 1$ if the mother has a child aged 6–8 as of September 30th, and $Eligible = 0$ if her children are all younger than six on that date. Note that ECCE enrollment for children aged 6-8 as of September 30th is nearly universal (97%) so ECCE enrollment and eligibility are effectively interchangeable for interpretation.

[9] We use a two-way fixed effects approach to estimate the DID estimator. Although recent advances have introduced alternative DID estimators to address some limitations of the traditional approach, these alternatives are unnecessary for our analysis. For example, staggered DID designs have been developed by researchers to allow for varied treatment timings across groups (Borusyak, Jaravel, and Spiess 2024). In our case, however, school start dates are uniform across all groups, so there is no staggered treatment effect to account for. Likewise, our treatment is binary, so we avoid the issues of continuous treatments (Callaway, Goodman-Bacon, and Sant'Anna 2024).

[10] School hour cutoffs based on when 75% of children are in school, using time use data on time children in primary spent in school, discussed and presented below.

[11] We categorize mothers into two groups: higher educated and lower educated, using intermediate education as the cutoff. A mother is classified as higher educated if her education level is intermediate or above, which includes vocational secondary, post-secondary institutions, and university or higher degrees. A mother is classified as lower educated if her education level is below intermediate, which includes illiterate, those who can read and write but lack an educational credential, as well as primary and preparatory education.

[12] Respondents were asked their agreement with the statement, "The husband should help his working wife raise their children." Responses were categorized into two groups: gender norms about caregiving inequitable (strongly disagree, disagree, or neutral) and gender norms about caregiving equitable (agree or Strongly agree).

[13] Nuclear households consist of a husband, wife, and their children only. Extended families include additional members beyond the husband, wife, and children.

[14] Because the time use module is about the day preceding the current day, and surveys do not occur equally on all days of the week in fieldwork, particularly from employed individuals, these descriptives re-weight time use outcomes to ensure an equal distribution of days overall, by sex, and by whether the respondent is employed.

[15] Tests undertaken using rddensity version 2.3 (Cattaneo, Jansson, and Ma 2018).

[16] All FRDD plots estimated using rdplot (Calonico, Cattaneo, and Titiunik 2014).

[17] The functional form of outcomes, not the treatment, is prioritized and the same functional form should be used for the treatment as well (Imbens and Lemieux 2008; Lee and Lemieux 2010).

[18] The paper looks at the impact of ECCE services on women's employment for women with ECCE-eligible children; it does not consider the impact of ECCE on women's employment via working in ECCE, and the care economy including ECCE is dominated by women (Krafft and Ehab 2023; Economic Research Forum and UN Women 2020; International Labour Organization 2018).

[19] In contexts where employment rates are higher, even shorter hours of care may increase employment (Swart, Van Den Berge, and Van Der Wiel 2019).