Mother's Education and Early Childhood Educational Care

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Abstract

We examine the impact of the extension of mandatory education from five to eight years on mothers' time spent in early childhood educational care using Turkish Time Use Survey data. We document that the compulsory education reform increased mothers' completion of at least middle school (at least eight years of schooling). However, when we examine the effect of the reform on mothers' time spent on early childhood educational care, we find that the reform had no significant effect on time spent in reading to children, playing with children, and talking to children. Our results contribute to existing OLS studies that find a positive association between a mother's own schooling and time spent on children, a finding also confirmed in our OLS estimation of mother's education on time spent on early childhood educational care. However, since our estimates for intent-to-treat effect of the reform are insignificant, we suggest that results of OLS studies may be largely influenced by omitted variable bias such as mother's ability and social norms affecting both maternal education and childcare behavior. Our results have important implications as about half of pre-primary age children in the world are not enrolled in pre-primary education and hence spend most of their time at home.

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1. INTRODUCTION

A vast empirical literature in sociology, psychology, and economics has documented that early childhood care and education have a crucial impact on educational and labor market outcomes of children both in the short and long term (Heckman, 2006; Barnett & Masse, 2007; Heckman, Moon, Pinto, Savelyev, & Yavitz, 2010; Reynolds, Temple, Suh-Ruu Ou, Arteaga, & White, 2011; Heckman & Karapakula, 2019). Although many studies document the lifelong benefits of early childhood education and care, according to a UNICEF report (2019), in 2017, about half of all pre-primary-age children in the world, which is more than 175 million children, are not enrolled in pre-primary education. Furthermore, in high-income countries, in 2018, 83 percent of children were enrolled, while the corresponding enrolment rate in pre-primary education in low-income countries was only 22 percent.[1] Due to the high cost of providing free pre-primary education, low and lower-middle-income countries struggle to rise enrollment rates in pre-primary education. Hence, children spend most of their time at home, making parental time spent on their care an important factor in their early childhood education.

Recent literature has shown that not only early childhood education and care but also parental child care is a key input for the development of human capital. In particular, the literature has documented the importance of parental child care in the development of children's cognitive and non-cognitive skills for children, especially for those at age 0-2 (Hart & Risley, 1995; Cunha & Heckman, 2008; Cunha, Heckman, & Schennach, 2010; Cartmill et al. 2013; Gunderson et al. 2013; Fiorini & Keane, 2014; Hernandez-Alava & Popli, 2017)[2]. It is well known that parents' education levels are associated with a higher parental time investment in children. Existing studies use ordinary least squares regressions and establish a positive correlation (Leibowitz, 1977; Hill & Stafford, 1980; Sayer, Gauthier, & Furstenberg, 2004; Sayer, Bianchi, & Robinson, 2004; Gauthier, Smeedeng, & Furstenberg, 2004; Bianchi, Robinson, & Milkie, 2006; Guryan, Hurst, & Kearney, 2008; Craig, Powell, & Smyth, 2014; Altintas, 2016; Salehi-Isfahani & Taghvatalab, 2018); however, unobservable individual factors (such as intelligence, ability and emotional intelligence) and unobservable family factors (such as social norms, values and preferences) might affect both mother's education and child care behavior.

We, therefore, contribute to the existing literature by investigating the impact of the extension of mandatory education from five to eight years in Turkey on activities that are considered to be primary components of early childhood education and care, namely time spent in reading to children, playing with children, and talking to children. Research has shown that reading and talking to children and playing with children are important factors for the brain development of children in early childhood period, especially for children under the age of 3 (Bergen, 2002; Ginsberg, 2006; Hurtado, Marchman,

[1] UNICEF (2019) calculates the enrolment ratio of pre-primary education for 2018 by using the data from the UIS global database in most recent year, 2010–2017.

[2] There are also studies showing that non-parental child care for children at age 0-2 has negative effects on children's development of cognitive and non-cognitive skills (Baker, Gruber, & Milligan, 2008; Herbst, 2013; Fort, Ichino, & Zanella, 2020).

& Fernald, 2008; Mol & Bus, 2011; Shneidman, Arroyo, Levine, & Goldin-Meadow, 2012; Weisleder & Fernald, 2013; Hsin and Felfe, 2014; Kalb & Van Ours, 2014; Reed, Hirsh-Pasek, & Golinkoff, 2017; Yogman, Garner, Hutchinson, Hirsh-Pasek, & Michnick, 2018). Hence, our primary outcome variable appears to be well-chosen to measure early childhood care and education provided by mothers.

We examine the impact of the compulsory schooling reform on maternal education because mothers are the main child care providers due to social and cultural norms and financial constraints in many countries, including Turkey (Caner, Guven, Okten, & Sakalli, 2016). In fact, less than 1 percent of children aged 0-2 are enrolled in pre-primary education in Turkey much lower than the OECD average of 33 percent (OECD, 2020). In this study, we analyze the intent-to-treat effect of the reform that increased mothers' education levels on time spent in childcare. We choose not to instrument mother's education with the education expansion reform because the reform as an instrument does not satisfy exclusion restrictions as more educated women tend to marry more educated men and the reform can affect potential outcomes through other channels (See, also, Kirdar, Dayioglu, & Koc, 2018; Akyol &Kirdar, 2022; Akyol &Mocan, 2022).

In the 1997-1998 academic year, the compulsory schooling law, which extended mandatory education from five years to eight years of schooling, was enacted in Turkey. In particular, the reform allowed individuals born before 1986 to drop out of school after they completed five years of primary school, whereas those born after 1986 had to complete five years of primary school as well as three years of middle school. Turkish compulsory schooling reform was exogenous to parental decision making and mostly driven by political factors, which leads to an exogenous increase in educational attainments of individuals born after 1986, but not for those born before 1986.

Using the 2014-2015 Turkish Time Use Survey, a nationally representative survey, and implementing the reduced form regression models, we assess whether an exogenous increase in the education level of mothers has any effect on time spent in early childhood care. In particular, we first find out how the compulsory schooling reform affects mothers' schooling outcomes. We next investigate whether the exposure to the reform has any impact on mothers' time spent in early childhood care, particularly time spent in reading to children, playing with children, and talking to children. More precisely, we estimate the intent-to-treat impact of the compulsory schooling reform on time spent in early childhood care by implementing the reduced form regression models for mothers who have at least one child aged between 0 and 2.

We document that the compulsory education reform increased mothers' completion of at least middle school, consistent with the existing literature which examines the impact of maternal education on the different outcomes by utilizing the same Turkish education reform (Dincer, Kaushal, & Grossman, 2014; Güneş, 2015, 2016; Dursun, Cesur, & Kelly, 2017; Özer, Fidrmuc, & Eryurt, 2018; Usta, 2020), while it did not affect the completion of at least high school or university. Our main results show that the reform does not have any significant effect on mothers' time spent in early childhood care. Moreover, we do not find any evidence of reform effects on mothers' probability of time devoted to

early childhood care activities. On the other hand, we also document that the change in the compulsory years of schooling leads to an increase in mothers' time spent on other activities (eating, house cleaning, socializing with family, and celebrating events) accompanied by children. Thus, our findings indicate that the education reform has no impact on the quality of time spent with children, as time spent in reading to children, playing with children, talking to children as well as time spent in educational activities accompanied by children does not change[3]. Furthermore, in terms of labor market outcomes, we do not find any significant impact of the reform on mothers' employment as well as hours worked. This result is in line with Dincer et al. (2014), Güneş (2015), and Usta (2020), which use data from the Turkish Demographic and Health Survey (TDHS) to investigate the impact of Turkish education reform on the labor force participation rate of mothers. In addition, we document that there is no significant impact of the education reform on the marriage and fertility behavior of women, which is also in accordance with the findings of Gulesci and Meyersson (2013), Kirdar et al. (2018), and Usta (2020). Overall, our results show that increased education had no impact on time spent in early childhood care, and the positive association between time spent in early childhood care and education that is found in the literature and also confirmed in our OLS estimation is likely to result from omitted variables such as intelligence and values that affect both mother's education levels and time spent in early childhood care. We should also note that it is possible that the extension of three years at the secondary school level has no impact on time spent in early childhood care and increased education at higher levels such as tertiary education attainment, may yield different results. Although we do not find any significant effect of the reform on early childhood education provided by mothers, we further investigate the factors that may affect time spent in early childhood care. In particular we consider whether the education reform that increased mothers' educational attainment affects labor market outcomes and preferences for childcare. For example, the higher the level of a woman's educational attainment, the fewer children she is likely to bear (Leon, 2004; Breierova & Duflo, 2004; McCrary & Royer, 2011; Cygan-Rehm & Maeder, 2013; Amin & Behrman, 2014; Kirdar et al. 2018) and fewer children per woman and delayed marriage and childbearing could mean more time spent per child. Also, education may affect parental attitudes as more educated mothers might be better informed on the benefits of early childhood education.

Our paper is most closely related to Usta (2020), which examines the impact of Turkish education reform on early non-monetary investments of mothers in their last children (aged 0-5), including time spent with children using Turkish Demographic Health Survey (TDHS). Although Usta (2020) argues that the education reform increases mothers' time spent with their children at home and outside, the measure of time spent with children is an indicator variable that is equal to one if the mother states that she devotes time to her child and zero otherwise as TDHS does not include any information on total

[3] Following Price (2008), we consider quality time as time spent in all activities in which either the child aged was primary focus (*time spent in reading to children, playing with children, and talking to children*) or in which there is reasonable amount of interaction with children (*educational activities accompanied by children*).

time spent with children and the composition of that time.[4] Hence, Usta (2020) investigates the effects of the education reform on maternal child care at the extensive margin, mothers' probability of spending time with children, not at the intensive margin, mothers' time allocated to children, which is the focus of our paper. Therefore, we contribute to the literature by complementing the findings of Usta (2020). The explanation for different results between our study and Usta's may be found in how mothers may interpret the binary question on time spent in childcare in TDHS. Mothers may consider time spent in activities with their child (such as watching TV, eating with children going to a cinema or park) as maternal child care time; although they may not allocate time to play with children or read and talk to children in their daily routine. We support this argument by constructing alternative child care measures[5] and show that the impact of the reform depends on how we define maternal child care. In particular, our findings document that the education reform increases mothers' likelihood of time allocated to some measures of child care activities.[6]

We also test the validity of our results by conducting a placebo analysis; replicating our estimations in a range of alternative estimations windows; estimating our main model with quadratic time trends; as well as estimating our main model under alternative sample specifications.

Our results have important policy implications as half of pre-primary age children in the world are not enrolled in pre-primary education and enrollment rates are lower in low income countries and in families from poorer backgrounds. We find that increased mother's education level by three extra years, a considerable increase in education levels, does not yield to an increase in mother's time spent on early childhood educational care. Hence, in order to abridge the gap between rich and poor in terms of exposure to early childhood education, a more free and fair access to formal early childhood education and care deserves the attention of policy makers.

The rest of the paper is organized as follows: The next section provides the necessary background information about Turkish Compulsory Schooling Reform. Section 3 describes the data. In Section 4, we explain the identification strategy. Section 5 reports the descriptive statistics and the results. Section 6 shows the robustness checks. Section 7 revisits Usta (2020) with Turkish TUS. In Section 8, we conclude.

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[4] TDHS asks mothers who primarily spend time with children at the house and the outside of house. For this question, the possible answers are mother, father, and other people (daughter, son, woman's mother, husband's mother, nobody). By using the data derived from the respondents' answer, Usta (2020) generates an outcome variable, spending time with child, that takes value 1 if the mothers' answer to this question is mother, and 0 otherwise.

[5] See, Section 7, in which we revisit Usta (2020) with Turkish TUS, for the detailed explanation of alternative child care measures.

[6] In addition, Turkish TUS allows us to generate a more homogenous sample in terms of mothers' time constraint for maternal child care, as we find that the reduced form impact of the reform on time devoted to *all* children, at least one of them aged 0-2, whereas Usta (2020) investigates the impact of the reform on mothers' probability of time allocated to the *last* child aged 0-5. In section 7, we try to replicate the analysis sample of Usta (2020), and examine the intent to treat impact of the education reform on our outcome variables as well as other child care measures at the extensive margin.

2. BACKGROUND: TURKISH COMPULSORY SCHOOLING REFORM

In Turkey, in 1997, the parliament implemented the compulsory schooling law, which increases the compulsory years of schooling from five to eight years. Before 1997, the basic education in Turkey was composed of five years of compulsory primary school and three years of non-compulsory middle school. After completing five years of compulsory primary school, students could choose to study in general, vocational, or religious schools or had an option to drop out of school. However, the compulsory schooling law does not allow students to get the primary school diploma without completing an additional three years of middle school (Akar, Akyol, & Okten, 2022).

Turkish Compulsory Schooling Reform was unexpectedly enacted and immediately implemented in 1997. In particular, this reform was exogenous to parental decision making and mostly driven by political factors. The exposure to the compulsory schooling law was determined by the school starting age: Individuals born before 1986 could drop out after they complete five years of primary school, whereas those who were born after 1986 had to complete eight years of schooling, i.e., five years of primary school and three years of middle school. Thus, the law leads to an exogenous increase in individuals' years of schooling born after 1986, but not for those born before. Turkish law states that a child can start the first grade of primary school in the fall of the academic year if he/she is 6 year (72 months) old at the end of that calendar year. However, being 72 months-old requirements to enroll in primary school is not too strict; a child can start the first year of primary school if she/ he is on the margin of 72-month age cut-off. Therefore, a child born in 1986 could complete the primary education in 1997 and could be exempt from the compulsory schooling law. On the other hand, a child born in 1986 who could complete the fourth grade of the primary education in 1997 when the law was implemented could be exposed to the compulsory schooling law. Therefore, for the 1986 birth cohort, the exposure to the law is unclear (Dursun & Cesur, 2016; Cesur & Mocan, 2018; Dursun, Cesur, & Mocan, 2018; Kırdar, Dayioglu, & Koc, 2018; Akar et al., 2022, Akyol & Mocan, 2022).

Turkish compulsory schooling reform does not change the quality of education or the curriculum of the basic education. The compulsory education is free in public schools where most students are enrolled. However, parents need to incur some monetary cost such as the cost of school uniforms, transportation, meal or school supplies for sending their children to the state school. Full compliance with Turkish compulsory schooling reform is not accomplished because Turkish compulsory schooling reform is not strictly enforced, although the non-attendance of students to the compulsory school results in monetary fines for parents.

3. DATA

In this paper, we utilize the Turkish Time Use Survey (TUS), a nationally representative survey, conducted among 11,044 households (9,073 included in the survey), during the period of 1 August 2014-

31 July 2015. This survey was part of Harmonized European Time Use Study (HETUS) and utilized EUROSTAT (2000a, 2000b) activity classifications and coding as its basis.

The TUS is composed of four questionnaires: Household Questionnaire, Individual Questionnaire, Diaries and Work Schedule. In our analysis, we merge three data sets derived from Household Questionnaire, the Diaries, and the Individual Questionnaire of the TUS. Household questionnaire provides information about the children under the age of 10 in the household who receive the informal or formal child care from others. In the diary part of the TUS, individuals are asked to write down all of their daily activities for 24 hours at ten-minute intervals. The diaries collect information about primary activities that the individuals attend on weekdays and weekends. Specifically, regarding these primary activities, the diaries gathered the data about how much time individuals allocate to these primary activities, when and where individuals did these primary activities, and whether individuals were alone or not while doing these primary activities, if not, with whom (wife/husband, mother/father, a child less than 10 years old, other household member or someone else outside the household) they did these primary activities.

We generate one key outcome variable to measure mothers' time spent in early childhood care: ***Time spent in playing games with children, reading to and talking to children.*** We should also note that Turkish TUS does not provide any data for time spent in playing games with children, and time spent in reading to children, and time spent in talking to children, separately. We also construct an alternative outcome variable to produce comparable estimates to some of the literature on this subject: ***Time spent in educational activities accompanied by children***. We generate this outcome variable, *educational activities accompanied by children*, by using "with whom" questions in diaries, as in Guryan et al. (2008). In particular, to construct the outcome variable, *accompanied by children*, we use the data derived from respondents' answers to the following question: While you were doing this activity, was there any household member younger than 10 years old with you? ***Educational activities accompanied by children*** includes going to the cinema, exhibition, library, art-related activities, and reading books. Following previous literature, we also generate five outcome variables:[7] *i*) physical child care, *ii*) supervisory child care, *iii*) traveling with child, i*v*) other child care, and *v*) total child care. In addition to that to find out the intent-to-treat impact of the education reform on maternal child care at the extensive margin, we also construct a dummy variable***, activity participation***, that takes the value 1 if time spent in a particular activity per week is greater than 0, and 0 otherwise.

[7] *Physical child care* is time spent on the basic needs of children, including breast-feeding, feeding, changing diapers, rocking a child to sleep, bathing, looking at a child while playing, and so on. *Travelling with child* includes activities such as driving a child to school, to a cinema, to a music course, and to a doctor. *Supervisory child care* is time spent in accompanying a child while doing any activities. *The other child care* consists of the activities other than activities in physical, school-related, supervisory, travelling with child, and playing games with children, reading to, and talking to children. *Total child care* includes physical, playing games with children, reading to, and talking to children, travelling with child, supervisory, and the other child care activities.

We converted minutes per day reports for one weekday and one weekend day to minutes per week by multiplying respondents' time response for a weekday by five and time response for a weekend day by two and summing up reproduced time responses, as in Hofferth & Sandberg (2001), Aguiar & Hurst (2007), Guryan et al. (2008), and Hsin & Felfe (2014).

The Individual Questionnaire of the TUS consists of detailed data on demographics (age, gender, the region of residence, country of birth) as well as labor market outcomes of individuals. In particular, the survey gathers data about individuals' employment status, earnings, hours worked, occupations, side jobs, and full-time/part-time employment. However, the survey does not contain any information about respondents' actual wages, but it asks respondent to select one of the wage group among five wage category in the Individual Questionnaire. To investigate the impact of schooling on individuals' earning, we therefore generate an outcome variable, *Higher than Minimum Wage*, which is equal to 1 if the respondent's wage group is in the higher wage group, i.e. the cut of value of respondents' wage group is higher than the average minimum wage of Turkey in 2014 and 2015, and 0 otherwise.[8] We also explore the effects of schooling on mothers' employment by constructing a binary variable, *employment*, which takes the value 1 if the respondent works for at least one hour with/without receiving payment during the last week or the respondent is temporarily unemployed, and 0 otherwise.

Individuals' years of birth are used to identify individuals' exposure to the compulsory schooling reform, in contrast to a number of papers that utilize the same Turkish reform and implement a sharp regression discontinuity design by using individuals' birth month (see, for instance, Gulesci, Meyersson, & Trommlerova, 2020; Usta, 2020). Misreporting of the birth month in Turkey is a common issue; and therefore, relying on the month of birth to identify the impact of the reform could be problematic as we will discuss in detail in the empirical strategy section. We should also note that the Turkish Time Use Survey does not collect information on individuals' month of birth. We thus generate a binary variable, *Reform,* which is equal to 1 if individuals were born after 1986, and 0 otherwise. The TUS does not collect any data on individuals' years of schooling; however, it contains information about individuals' most recent degree they obtained. The survey categorizes individuals' most recent degree they obtained into 5 groups: *i*) No degree, *ii*) primary school degree, *iii*) middle school degree or vocational middle school degree, *iv*) high school or vocational high school degree, and *v*) university degree or above (master/Ph.D.). Therefore, we use the data on education status to construct a binary variable, *Middle School*, which is equal to 1 if individuals obtain at least middle school degree, i.e., complete at least eight years of schooling, and 0 otherwise.

[8] In the Individual Questionnaire, there are five wage groups that represents the wage of the respondent: Wage group 1: 0-1080 Turkish Liras (TL), Wage group 2: 1081-1550 Turkish Liras (TL), Wage Group 3: 1551-2170 Turkish Liras (TL), Wage Group 4: 2171-3180 Turkish Liras (TL), and Wage Group 5: 3181 Turkish Liras (TL), and higher. Minimum wage in 2014 and 2015 are 891.04 TL and 1,000.55 TL, respectively. Higher than Minimum Wage group consists of the wage group 2, 3, 4, and 5. Lower or Equal to Minimum Wage group is the lowest wage group, i.e., the wage group 1.

According to an OECD report (2020), less than 1 percent of children aged 0-2 are enrolled in pre-primary education in Turkey much lower than the OECD average of 33 percent. Hence, we focus on mothers with at least one child less than 3 years old in order to avoid sample selection to formal daycare. In addition to that, focusing on mothers with at least one child under 3 years old helps us to form more homogeneous treatment and control groups. Therefore, we restrict our sample to married mothers aged between 22 and 35 (born between 1980 and 1992) who have at least one child aged between 0 and 2.[9] Married mothers aged 22-28 *(born between 1987 and 1992*) are assigned to the treatment group, while married mothers aged 29-35 *(born between 1980 and 1985*) are assigned to the control group. In the result section, we will show that our sample does not suffer from the sample selection bias.

As we explained in section 2, for the 1986 birth cohort, the exposure to reform is uncertain. Therefore, the 1986 birth cohort is excluded from our main analysis (see, for instance, Dursun & Cesur, 2016; Kırdar et al., 2018; Cesur and Mocan, 2018; Dursun et al., 2018; Akar et al. 2022). We should also note that including those born in 1986 does not change our results.

4. IDENTIFICATION

We first examine the impact of the educational reform on maternal education by estimating the following functional form

$$Middle\ School_i = \gamma_0 + \gamma_1 Reform_i + \gamma_2 X_i + \gamma_3 Y_i + \mu_i \quad (1)$$

where *Middle School* is a binary variable that is equal to 1 if the individual completes at least middle school, i.e., *at least eight years* of schooling, 0 otherwise. We also regress *High School* and *University* on the variable *Reform* to examine whether educational reform has any impact on educational attainment at the higher level. *Reform is* equal to 1 if the individual was born after 1986, and otherwise. In particular, in line with previous literature, we identify the impact of the education reform by using individuals' year of birth for several reasons.[10] First of all, as the school starting age is not strictly enforced in Turkey, we exclude those born in 1986 from our main analysis as the exposure to the reform is uncertain for the 1986 birth cohort (see, Kirdar et al. 2016; Cesur & Mocan, 2018; Torun, 2018; Akyol & Mocan, 2020; Akar & Okten, 2021). Second, information regarding individuals' month of birth in Turkish data sets is incomplete and noisy as the parents may delay the birth registration to official documents (Akyol & Mocan, 2022). In addition, misreporting of birth month is a common issue in Turkey, as about one in five Turkish birth certificates reports January as the month of birth (Akyol & Mocan, 2022). Finally,

[9] We should note that the average age of becoming a father for the first time is older than a mother. In our main analysis, due to the small sample size of fathers as well as large sample size difference between the treatment and control groups of fathers, we do not examine the impact of fathers' education on time spent in child care activities.
[10] See, Akyol and Mocan (2022) for detailed explanation why we should not use individuals' month of birth to identify the impact of Turkish compulsory schooling reform.

misreporting of the month of birth may lead to failure of the exclusion restriction assumption of the Instrumental Variable method (IV) (see, Akyol & Kirdar, 2022; Akyol & Mocan, 2022).[11]

X_i represents a vector of dummy variables for survey-month fix effects, survey-year fixed effects, and the region of residence fixed effects. These set of fixed effects aim to account for time and regional differences that may affect mothers' time allocation to children. Y_i is a vector of control variables including total number of children, the age of the first-born child, and the age of last-born child. These variables intend to capture the effects of the number of children and the age of child on the allocation of mothers' time to early childhood care activities, as previous literature indicate that these variables are important factors that influence parents' time investment in children[12]. Here, we should also mention that we first check whether the education reform has any effect on these variables before adding them as a control variable in our regression. In the next section, we will discuss results in detail.

To account for the potential differential time trends in the early childhood care outcomes, we add split linear time trend before and after cut off birth year. In particular, Y_i also includes control variables such as re-centered birth year for treatment and control groups; re-centered birth year for the treatment group is defined as $Year_{tre} = Reform_i \times (Yob_i - 1986)$ and re-centered birth year for the control group is defined as $Year_{cont} = (1 - Reform_i) \times (Yob_i - 1986)$, where Yob_i is a variable that the individual was born in. We add re-centered birth year differentiated by the exposure to the reform status to disentangle age trends in both early childhood care outcomes as well as maternal education (Fort, Schneewis, & Winter-Ebmer, 2016; Cesur & Mocan, 2018; Dursun & Cesur, 2016; Dursun, Cesur, & Mocan, 2018; Kirdar et al. 2018; Akar et al. 2022). In this regression, standard errors are clustered at the region by birth cohort level.

Estimating the impact of maternal education on time spent in early childhood education and care activities using the Ordinary Least Square (OLS) techniques may produce a biased estimate as an individual's educational attainment is endogenous. As in the previous literature, the exposure to the reform may be used as an instrument for educational attainment to generate exogenous variation in the level of schooling but not in early childhood care outcomes[13]. However, in our case, the Instrumental Variable (IV) approach is not applicable because the exclusion restriction condition is more likely to be violated. In particular, an increase in schooling level may influence women's propensity to marry with

[11] Akyol and Kirdar (2022) document that the reform increases the survey response quality of individuals. In addition, Akyol and Mocan (2022) find that those who have a middle school diploma and those who have at least a high school diploma are more likely to report their month of birth in comparison to those with less than middle school education.

[12] See, for instance, Zick and Bryant (1996), which show that the age of youngest child is the important determinant of mothers' time spent with children. In addition, Price (2008) also document that the birth-order matters for the parent-child quality time, as a first born-child receives more quality of time with parents than a second born child.

[13] The Turkish compulsory schooling reform is used as an instrument for education to investigate the effect of education on individual level outcomes such as labor market outcomes (Mocan, 2014; Aydemir & Kirdar, 2017; Torun, 2018), drop-out decisions (Caner, Guven, Okten, & Sakalli, 2016), political behavior outcomes (Cesur & Mocan, 2018), health outcomes (Cesur, Dursun, & Mocan, 2018), subjective well-being (Dursun & Cesur, 2016), voluntary work outcomes (Akar et al.2022), leisure-time behavior (Akar, 2022).

higher educated men by changing their preferences for marriage. These arguments are also made by recent studies which investigate the impact of the education reform on marriage and fertility outcomes of women, women's exposure to intimate partner violence, and consanguineous marriage (See Kirdar et al.2018; Akyol & Kirdar, 2022; Akyol & Mocan, 2022). We confirm this finding by documenting that for mothers, the reform increases the probability of marrying a spouse who has at least middle school diploma (see Table B.1. in Appendix)[14]. This result is consistent with the findings of Akyol and Kirdar (2022), which shows that Turkish compulsory schooling reform increases partners' middle school completion. We, therefore, estimate the reduced form effects of the compulsory schooling reform, which is equivalent to an "intent to treat" (ITT) analysis by estimating the following regression equation using the ordinary least squares (OLS) technique[15]:

$$CC_i = \delta_0 + \delta_1 Reform_i + \delta_2 X_i + \delta_3 Y_i + \varepsilon_i \quad (2)$$

where CC_i is the early childhood care outcome for the ith individual. Our key outcome variables are: Time spent in reading to children, playing with children, and talking to children. We report these results as reduced form effects of the reform on time spent in early childhood care. Our control variables are the same as in equation 1. In the estimation of equation 2, standard errors are clustered at the region by birth cohort level. We also implement an alternative method for correcting standard errors. We estimate the p-values using wild cluster bootstrap as clustering standard errors at birth cohort results in 12 clusters that may not be large enough to get an accurate inference. The results for which we cluster standard errors at birth cohort level also confirm our main findings.

We also investigate whether the cohort effects confound our findings on the impact of maternal education on time spent in early childhood care activities. In particular, we widen and narrow the estimation windows as well as add the split quadratic time trends into regressions at wider bandwidth. Apart from this, we also carry out a placebo test by restricting the sample to those born between 1980-1985, who are in our control group and not exposed to the compulsory schooling reform, and examine the impact of the *placebo reform* which takes the value 1 if individuals were born between 1983 and 1985, and takes the value 0 if individuals were born between 1980 and 1982.

5. RESULTS

In this section, we first present the descriptive statistics of the main analysis sample. Second, we check whether the education reform has any impact on the marriage and fertility behavior of women. Next, we

[14] Our results also report that the education reform has no impact on husbands'age, which is in line with Usta (2020) (see the last row of Table B.1 in Appendix). We should also note that we do not find any impact of the education reform on the age gap between mothers and their husbands.

[15] To account for too many zeros in time use survey data, we also run Tobit regressions for equation (2) and document that different model implementations do not change our main findings.

investigate the effects of the compulsory schooling reform on schooling outcomes and then on time spent in reading to children, playing with children, and talking to children. We show the effects of the educational reform on other child care outcomes and also present our results showing how the compulsory schooling reform affects mother's time spent in other daily activities.

5.1. Descriptive Statistics

Table 1 shows the descriptive statistics for all mothers who have at least one child under the age of 3 (columns 1 to 3). The treatment group consists of married mothers aged 22-28 (born between 1987 and 1992), who have at least one child under the age of 3, and the control group includes married mothers aged 29-35 (those born between 1980 and 1985), who have at least one child under the age of 3. Our results show that the average age of married mothers in the treatment group is around 25.5 years old, whereas the corresponding average in the control group is around 32 years old. The Panel A of Table 1 also shows that around 70 percent of married mothers in the treatment group have at least middle school degree, while in the control group, at least middle school completion rate of married mothers is 49 percent (Figure 1 in Appendix).

The descriptive statistics for labor market outcomes are presented in the Panel B of Table 1. In our sample, 20.8 percent of mothers are either employed or temporarily unemployed. In particular, on average, nearly 18 percent of mothers in the treatment group and 23.4 percent of mothers in the control group are either employed or temporarily unemployed. Moreover, on average, mothers in the control group work nearly 9 hours per week, while mothers in the treatment group work about 7 hours per week. In addition, we consider the sample of employed mothers to compare the share of mothers earning higher than minimum wage between treatment and control groups. For mothers in the control group, on average, the share of employed mothers earning more than the minimum wage (the average minimum wage of 2014 and 2015) is 77 percent, while the corresponding share is 69 percent for employed mothers in the treatment group.

In the Panel C of Table 1, we provide descriptive statistics for time spent in early childhood care. We first show that, on average, mothers in the treatment group spent 332 minutes per week playing with children, reading to their children, and talking to children; on the other hand, mothers in the control group allocated about 279 minutes per week to these activities (see also Figure 2 in Appendix). Moreover, we report the descriptive statistics for the proportion of mothers who allocate time to playing with children, reading to their children, and talking to children. 70 (66) percent of mothers in the treatment (control) group allocate time to early childhood care activities (see also Figure 3 in Appendix).

In the Panel D of Table 1, we present descriptive statistics for children's background characteristics. First of all, we document that for mothers in the treatment group, the average age of the first-born child is around 3.5, while the corresponding age for mothers in the control group is 7. Moreover, on average, mothers in the control group have approximately 2.5 children, whereas mothers in the treatment group

have approximately 1.8 children. When we look at the number of children under the age of 3, we document that on average married mothers both in the treatment group and the control group have around 1.1 children under the age of 3.

Overall, as mothers in the treatment group is younger than those in the control group, there may be some differences in mothers' total number of children and the age of first-born child, and the age of last-born child. In our analysis, we will address the effects of maternal age differences in time spent in child care activities.

5.2.Preliminary Checks: Impact of Reform on Sample Selection and Fertility

Before we present our main results, we assess whether the reform has any effect on the sample selection, as we restrict our sample to married mothers having at least one child aged 0-2. Therefore, we first examine the impact of the education reform on the marriage outcomes for the sample of all women. As seen in the first row of Table 2, there is no significant impact of Turkish compulsory schooling reform on the probability of being married. Then, we show that the education reform does not affect the likelihood of becoming a mother (given a birth) for the sample of married women. Finally, we document that for the sample of all mothers, we do not observe any effect of the reform on the probability of being a mother who have at least one child aged 0-2[16]. Thus, our findings indicate that our sample does not suffer from the sample selection bias. For the sample of all mothers, we also explore whether Turkish education reform has any impact on the number of children that mothers have and mothers' age at first birth. The results presented in the last rows of Table 2 show no evidence of policy effect on the number of children as well as age at first birth. All these results are consistent with Gulesci & Meyersson (2013), Kirdar et al. (2018), and Usta (2020), which examines the impact of the same Turkish education reform on marriage outcomes and fertility of women. In particular, Kirdar et al. (2018) indicate that Turkish compulsory schooling reform reduces the probability of marriage and first birth in teenage years, and these effects vanish after age 18[17]. The findings of Kirdar et al. (2018) support our main findings in Table 2 as we focus on mothers aged between 22 and 35 in our analysis.

As we discussed in the identification section, we include the number of children as well as the age of the children as a control variable in our regressions, because we consider that these variables are important determinants of mothers' time investment in children (See also Zick & Bryant, 1996; Price

[16] We also check whether the reform has any effect on sample selection by exaimining the impact of Turkish compulsory schooling reform on the number of children aged between 0 and 2 for our main analysis sample (See column (1) of Table B.2. in Appendix).

[17] Using the data from TDHS, Gulesci and Meyerson (2013) show that the compulsory schooling reform has no impact on the timing of either marriage or birth, nor on the number of children. On the other hand, utilizing the same data and the same education reform, Dincer et al. (2014) and Güneş (2015) document that the reform reduces womens' fertility and increases women's age at first marriage and age at first birth. A long the same line, Güneş (2016) report that this reform reduces teenage fertility. More recently, Kirdar et al. (2018) also show that the education reform has a negative and robust effects on teenage marriage and fertility, but up to the certain age. However, consistent with Gulesci and Meyerson (2013), Kirdar et al. (2018) also find that the effects of the reform vanish after a couple of years, when individuals has a right to leave school.

2008). Before adding them as a control variable in our regressions, we also check whether the education reform has any effect on these variables for our analysis sample. Table B.2. in Appendix displays these results. In particular, for mothers who have at least one child aged 0-2, we do not observe any impact of the reform on the number of children (column (2) of Table B.2). In line with Usta (2020), we also report that there is no impact of the reform on the age of child, particularly the first-born and the age of last-born child (column (3) and (4), respectively).

5.3. Main Results

5.3.1. Schooling Outcomes

Table 3 reports the estimation results of Equation (1) for mothers and all women in Panel A and B, respectively. First of all, in the column (1) of Panel A, we document that the educational reform significantly increases the educational attainment of mothers who have at least one child under the age of 3 by 20 percentage points (ppt). Furthermore, we examine the effects of the reform on the completion of at least a high school and at least a university. However, our findings show that there is no significant impact of the reform on the probability of obtaining at least high school degree or university degree (see column (2) and (3) of Table 3). The second panel of Table 3 presents the impact of the education reform on the schooling of all women. As seen in the column (1), (2), and (3) of Table 3, we show that the impact of the education reform on at least being a middle school graduate for mothers is higher than for all women.

5.3.2. Time Spent on Early Childhood Care

We examine the effects of the exposure to the reform on time spent in early childhood care in this section. We use time spent in reading to children, playing with children, and talking to children as our primary early childhood care outcome variable.

Table 4 reports the reduced form effects (intent-to-treat effects) of the compulsory schooling reform on early childhood care outcomes for mothers at the intensive margin (time spent in reading to children, playing with children, talking to children) and at the extensive margin (the probability of time spent in reading to children, playing with children, talking to children) in the Panel A and B, respectively. Results derived from our main analysis sample are shown in column (3) of Table 4. To examine whether our results are due to the across the board age effect, we, first, estimate our model by narrowing the estimation window to 5-year (the cohorts of 1991-1981). Then, we widen the estimation window to 7-year (the cohorts of 1993-1979) and 8-year (the cohorts of 1994-1978) and add split quadratic time trends around the cutoff. In all regressions reported in Table 4, we include the total number of children, the age of first-born, and the age of last-born child as control variables. As we showed in the previous section, there are no significant effects of the exposure to the educational reform on these variables (see Table B.2 in the Appendix). Moreover, excluding these variables from our analysis does not change our findings. As a result, as seen in the Panel A of Table 4, for all estimation windows, we do not find any

significant impact of the compulsory schooling reform on time spent in early childhood care. Our findings at the extensive margin also indicate that there is no evidence of reform effects on the probability of time spent in early childhood care (Panel B of Table 4).

To generate a more homogeneous sample in terms of mothers' time constraints, we also restrict the sample to stay-at-home mothers, i.e., non-working mothers, and investigate whether the education reform has any impact on early childhood care[18]. Therefore, in order to assure that this sample does not suffer from sample selection problem, we first show that the exposure to the compulsory schooling reform has no impact on the employment probability of mothers[19] (Table B.3 in Appendix). This result is also in line with Dincer et al. (2014), Gunes (2015), and Usta (2020), which uses data from TDHS to investigate the impact of the education reform on mothers' employment. In addition to that, we do not find any reduced form impact of the reform on working hours of mothers. Previous studies also show that the education reform increases women's earnings in Turkey although it has no impact on the labor force participation of females (Mocan, 2014; Aydemir & Kirdar, 2017; Torun, 2018). As we mentioned in the data section, due to the limited data on earnings, we examine the impact of the reform on the likelihood of earning higher than minimum wage rather than the actual wage of mothers, and show that there is no significant impact of the reform on this outcome variable. We consider that the small sample size of working mothers may generate inconsistent results with previous literature. As a result, we conclude that restricting our sample to stay-at-home mothers does not change our main findings (see Table B.4. in Appendix).

We also investigate whether our results are due to the fact we restrict our sample to mother with younger children. To address this point, we also limit our sample to those who have at least one child aged 0-4 as well as 0-6, and examine the impact of the education reform on time spent in early childhood care. Similar to our main results, for these sample specifications, we do not observe any significant reduced form effect of the reform on the allocation of time to reading to children, playing with children, and talking to children (see Table B.5. in Appendix).

As we mentioned in the previous section, the reform increases mothers' probability of marrying a spouse who has at least middle school diploma. Considering the possibility that more educated husbands may spend more time in early childhood care activities[20], we find out the effects of an additional three years of schooling, due to a change in the compulsory schooling law, on husband's time devoted to reading to children, playing with children, and talking to children as well as educational activities

[18] Female labor force participation rate is about 30 percent in Turkey (20 percent in our sample, possibly due to our requirement that women have at least one child under 3), working women is rather a select sample.

[19] As a robustness check, we also exclude the control variables, the total number of children, the age of first-born child, and the age of last-born child, and find that excluding these variables from regression does not change our main results.

[20] For instance, Pleck (1997) shows that fathers devote more time to teaching and playing activities, whereas mothers allocate more time to routine childcare activities.

accompanied by children. However, the results in Table B.6. in Appendix report that there is no intent-to-treat impact of the education reform on husband's early childhood care time.

Although our main analysis focuses on the effects of maternal education on time spent in reading to children, playing with children, and talking to children, we also exaimine the impact of the education reform on time spent in other childcare measures such as time spent in physical, supervisory child care activities, and traveling with child, which may depend on a child's specific needs[21]. Table B.7. in Appendix displays the impact of the exposure to reform on other child care measures. First of all, we find no evidence of the reform effect on time spent in physical child care activities as well as total child care activities (column (2) and (6) of Panel A). On the other hand, we show that the education reform significantly reduces time spent in supervisory activities, time spent in traveling with children as well as time spent in other child care activities (see columns (3), (4), and (5) of Panel A). Moreover, our findings in the Panel B of Table B.7 report that there is no reduced form effect of the reform on the probability of time devoted to child care activities except for supervisory activities.

Overall, our results show that increased education had no impact on time spent in early childhood care. The positive association between time spent in early childhood care and mother's education found in the previous OLS studies is probably due to the omitted variable bias, as individual characteristics and family characteristics may influence both early childhood care and maternal educational attainment. In line with previous OLS studies, we also document the positive association between education and time spent in early childhood care activities (see Table B.8. in Appendix). It is also possible that the extension of three years at the secondary school level has no impact on time spent in early childhood care and increased education at higher levels such as tertiary education attainment may affect time spent in early childhood education.

5.4. Time Spent in Activities Accompanied by Children

As we mentioned in Section 3, we generate an alternative outcome variable, *Time spent in educational activities accompanied by children* including going to the cinema, exhibition, library, art-related activities, and reading books. We also examine whether the compulsory schooling reform affects time spent in other daily activities accompanied by children. Results are presented in Table B.9 in the Appendix. Motivation for this analysis is twofolds: First, since we find insignificant results for time spent in early childhood care, we would like to examine whether the extension of three years at the

[21] Traveling with child can be endogenous, as it depends on the location where a child lives. More educated mothers may have a house that is close to the city center, where most of the activities are more likely to be held. Moreover, we argue that mothers' allocation of time in physical child care do not necessarily help children to develop their cognitive skills. Hence, in some sense time spent in these activities is determined by both demand (from the child) and supply (from the mother) side factors.

secondary school level was too little to have any effect on any type of time use.[22] Second, Usta (2020) finds that mothers who were exposed to the reform are more likely to state that they devote time to her child which seems to contradict our results. However, if mothers perceive time spent on educational and other activities with children as time devoted to their children, then this can reconcile the two seemingly different findings.

Column 1 of Panel A in Table B.9. shows that the education reform has no impact on time spent in educational activities accompanied by children, which is in line with our main findings presented earlier. However, Table B.9. also reports that there is a positive and significant impact of the reform on time spent in eating, house cleaning, socializing with family, and celebrating events *accompanied by children* (columns 2, 3, 4, and 5 of Panel A, respectively)[23]. In addition, we also show that the reform significantly reduces time spent in sports and outdoor activities *accompanied by children* (column (6) of Panel A). We also find an evidence that the education reform increases time spent in all activities accompanied by children (column (7)). At the extensive margin, on the other hand, our results show that the education reform has no impact on the probability of time devoted to other activities accompanied by children, except for house cleaning (Panel B). In summary, the exposure to the educational reform leads to an increase in time spent in other daily activities accompanied by children, although it has no impact on time spent in early childhood care activities. We will revisit Usta (2020) in more detail as we will construct a sample more similar to hers in section 7.

6. ROBUSTNESS CHECK

We examine the validity of our main results by implementing several robustness checks. First of all, we conduct a placebo test by restricting the sample to those born between 1980-1985, who are in our control group and not exposed to the compulsory schooling reform, and examine the impact of the *placebo reform* which takes the value 1 if individuals were born between 1983 and 1985, and takes the value 0 if individuals were born between 1980 and 1982. As a result, as seen in Table B.10, we show that our results are due to the change in the compulsory years of schooling in 1997 in Turkey, as placebo reform has no impact on time spent in early child care activities.

Second, as we discussed in previous sections, the 1986 birth cohort is excluded from our main analysis due to the uncertainty of this cohort to the exposure to the compulsory schooling reform. As a robustness check, we include those born in 1986 in our analysis by considering that 1986 birth cohort is not affected by the reform, and then conduct our main analysis (see column (1) of Table B.11 in Appendix). Furthermore, instead of excluding the 1986 birth cohort, we assign the exogenous variable,

[22] See, also, Akar & Okten (2021) which shows that for females, increased education due to the change in the mandatory years of schooling in Turkey has a negative and significant causal impact on time spent in religious activities.

[23] We also find that the education reform has a positive and marginally significant reduced form impact on time spent in watching TV/DVD/video accompanied by children. The significance level is 13.3 percent for time spent in watching accompanied by children.

Reform, to the value of 0.50 (see column (2) of Table B.11 in Appendix) and 0.33 for the birth cohort 1986 (See column (3) of Table B.11 in Appendix). These specifications also confirm our main findings. Then, we explore whether including married mothers receiving child care from others in our sample leads to our main results. We, therefore, restrict our sample to those who do not receive child care from others and show that for this sample restriction, there is no significant impact of the exposure to the educational reform on time spent in early childhood care activities (see column (4) of Table B.11 in Appendix). We further investigate whether our results are due to the fact that mothers in our sample have older children that can help them to do child care activities. We, therefore, restrict our sample to those who have at least one child under the age of 3 but not have a child older than the age of 10. Our main results are also valid under this sample specification (see column (5) of Table B.11 in Appendix).

7. REVISITING USTA (2020) with Turkish TUS

We revisit Usta (2020) with Turkish TUS in this section to compare our results. Usta (2020) focuses on ever-married mothers who gave birth at most five years before the survey year by using TDHS which collects the data for mothers' investment in their last child. Therefore, Usta (2020) shows the impact of the reform on mothers' likelihood of time allocation to the *last* child aged 0-5, unlike in our paper in which we estimate the impact of the reform on time devoted to *all* children, at least one of them aged 0-2. Therefore, to replicate her findings, we restrict our sample to ever-married mothers born 1982-1991 as well as 1981-1992, whose last child aged between 0-5, and examine the reduced form effect of the reform on child care outcomes (Table B.12 in Appendix). However, in contrast to Usta (2020)[24], we do not find any evidence for the effect of the reform on the probability of time spent in our main outcome variable by using the data from Turkish TUS (column (1)). The reason might be that TDHS data does not have any information on activities carried out by mothers or the amount of time spent with children. In particular, the TDHS survey asks mothers who primarily spend time with children at home and out of home. And therefore, mothers may consider the time spent in any activities with their child (such as watching TV, eating with children, and going to a cinema or park) as maternal child care time. However, they may not allocate time to play with children, read, and talk to children in their daily routines. Our findings presented in Table B.12. in Appendix also support our argument as we find evidence of the effect of the reform on the likelihood of time spent in different child care measures. More precisely, we generate four alternative child care measures to show that the impact of the reform depends on how we define maternal child care time. Table B.13. in Appendix presents the composition of these child care measures[25]. As seen in column (3), we first show that the reform increases the probability of time

[24] The reduced form regression results of Usta (2020) document that the reform increases mothers' likelihood of time spent with children by 6.1 to 7.9 ppt, depending on bandwidth sizes.

[25] *Child Care measure 1* excludes time spent in playing with children, and talking and reading to children from time spent in total child care activities. *Child Care measure 2* includes time spent in total child care (excl.time spent in playing with children, reading and talking to children) as well as eating accompanied by children. *Child Care Measure 3* includes time spent in child care measure 2 as well as leisure activities accompanied by children

allocated to total child care activities (excl. time spent in our main outcome variable), i.e child care measure 1. In addition, when we also include eating accompanied by children in total child care activities (excl. time spent in our main outcome variable), we observe that the education reform increases mothers' probability of time spent in child care measure 2 (column (4)). Then, considering leisure activities accompanied by children such as listening to music, doing social activities, sports and outdoor activities, reading, and computer-based activities with children as maternal child care time, we document that the education reform rises the likelihood of time spent in child care measure 3 by 4.1 ppt (column (5)). Finally, as reported in column (6) of Table B.12, including time spent in household care activities accompanied by children in time spent child care activities (measure 3) also leads to a 4.4 ppt increase in the probability of time spent in child care measure 4. As a result, we conclude that although we do not find any impact of the compulsory schooling reform on the probability of time spent in playing with children, talking and reading to children (our main outcome variable), we provide an evidence on the impact of the reform on the alternative definitions of maternal child care. In particular, the unspecified definition of child care in TDHS might lead to an inaccurate measure of maternal child care. In contrast, Turkish TUS provides detailed and activity-based data by asking mothers to report their daily time use at ten-minute intervals for one weekday and one weekend. Therefore, we can provide evidence of the effects of the reform on time spent on specific activities.

8. CONCLUSION

Although many studies document the lifelong benefits of early childhood education and care, about half of all pre-primary-age children in the world, which is more than 175 million children, are not enrolled in pre-primary education (UNICEF, 2019). Since mothers are generally primary caregivers of young children, it is reasonable to assume that these children spend most of their time at home with their mothers making mothers' chilcare behavior an important policy question. Existing studies in the literature establish a positive association between mothers' schooling and time investment in children (Hill & Stafford, 1980; Sayer et al. 2004; Price, 2008; Guryan et al. 2008) using the ordinary least squares method. However, omitted variables such as mother's intelligence, values and social norms may affect both her education level and child care behavior.

In this paper, we investigate the impact of the extension in compulsory schooling in Turkey on mothers' time spent in reading to children, playing with children, and talking to children using the 2014-2015 Turkish Time Use Survey. We document that the compulsory education reform increased mothers' completion of at least middle school (at least eight years of schooling). However, when we examine the effect of the reform on mothers' time, we find that the reform had no significant effect on time spent in reading to children, playing with children, and talking to children. Since our estimates for intent-to-treat

(reading, listening to music, sports and outdoor activities, social activities, art and hobby, computer-based activities). *Child Care Measure 4* includes time spent in child care measure 3 as well as household care activities accompanied by children.

effect of the reform are insignificant, we suggest that results of OLS studies may be influenced by the omitted variable bias such as mother's ability and social norms affecting both maternal education and childcare behavior.

Our results have important policy implications as many children are not enrolled in pre-primary education and enrollment rates are even lower in low income countries and in families from poorer backgrounds. In order to abridge the gap between rich and poor in terms of exposure to early childhood education, a more free and fair access to formal early childhood education and care deserves the attention of policy makers.

REFERENCES

Akar, B. (2022). Does education affect leisure-time reading? Evidence from time use survey, *Applied Economics Letters*, DOI: 10.1080/13504851.2022.2118218

Akar, B., Akyol, P. & Okten, C.(2022) Education and Voluntary Work: Evidence from Turkish Time Use Survey. J Labor Res 43, 275–320 https://doi.org/10.1007/s12122-022-09335-0

Akar, B. & Okten, C. (2021). The impact of education on time spent in religious activities: evidence from Turkey, *Applied Economics Letters*, DOI: 10.1080/13504851.2021.1914316

Akyol, P., & Kırdar, M. G. (2022). Compulsory schooling reform and intimate partner violence in Turkey. *European Economic Review*, *150*, 104313.

Akyol & Mocan. (2022). Education and Consanguineous Marriage. Forthcoming Journal of Human Capital

Altintas, E. (2016). The widening education gap in developmental child care activities in the United States, 1965–2013. *Journal of Marriage and Family*, 78(1), 26-42.

Aguiar, M., & Hurst, E. (2007). Measuring Trends in Leisure: The Allocation of Time Over Five Decades. *Quarterly Journal of Economics*, 122: 969-1006.

Amin, V., & Behrman, J. (2014). Do more-schooled women have fewer children and delay childbearing? Evidence from a sample of US twins. *Journal of Population Economics*, 27(1), 1-31.

Aydemir, A., & Kirdar. M.G. (2017). Low wage returns to schooling in a developing country: Evidence from a major policy reform in Turkey. *Oxford Bulletin of Economics and Statistics*, 79 (6): 1046-1086.

Baker, M., Gruber, J., & Milligan, K. (2008). Universal child care, maternal labor supply, and family well-being. *Journal of Political Economy, 116*(4), 709–745.

Barnett, W.S., & Masse, L.N. (2007). Comparative benefit cost analysis of the Abecedarian program and its policy implications. *Economics of Education Review*, 26(1):113–125.

Breierova, L., & Duflo, E. (2004). The Impact of Education on Fertility and Child Mortality: Do Fathers Really Matter Less than Mothers? NBER Working Paper No. 10513.

Bergen, D. (2002). The role of pretend play in children's cognitive development. *In Early Childhood Research and Practice*, 4(1), 2–15.

Bianchi, S. M. (2011). Family Change and Time Allocation in American Families. *The ANNALS of the American Academy of Political and Social Science*, 638:21–44.

Bianchi, S. M., Sayer, L.C., Milkie, M. A., & Robinson, J. P. (2012). Housework: Who Did, Does or Will Do It, and How Much Does It Matter? *Social Forces*, 91:55–63.

Caner, A., Guven C., Okten C., & Sakalli S. (2016) Gender Roles and the Education Gender Gap in Turkey. *Social Indicators Research*, 129(3), 1231-54.

Cesur, R., & Mocan, N. (2018). Education, religion, and voter preference in a Muslim country. *Journal of Population Economics*, 31(1),1- 44.

Cesur R., Dursun B., & Mocan N. (2018). The impact of education health and health behavior in a middle income, low education country. *Economics & Human Biology*, 31, 94-114.

Cartmill, E. A., Armstrong, B. F., Gleitman, L. R., Goldin-Meadow, S., Medina, T. N., Trueswell, J. C. (2013). Quality of early parent input predicts child vocabulary 3 years later. Proceedings of the National Academy of Sciences, USA, 110, 11278–11283.

Craig, L., Powell, A., & Smyth, C. (2014). Towards intensive parenting?. *The British Journal of Sociology*, 65: 555-579.

Cygan-Rehm, K., & Maeder, M. (2013). The Effects of Education on Fertility Evidence from a Compulsory Schooling Reform. *Labour Economics*, Vol.: 25, Issue: C, pages 35-48.

Cunha F., & Heckman, J.J. (2008). Formulating, identifying and estimating the technology of cognitive and noncognitive skill formation. *J Human Res*, 43(4):738–782.

Cunha, F., Heckman, J.J., & Schennach, S.M. (2010). Estimating the Technology of Cognitive and Noncognitive Skill Formation. *Econometrica,* 78 (3): 883–931.

Dincer, M.A., Kaushal, N., & Grossman, M. (2014). Women's education: harbinger of another spring? Evidence from a Natural Experiment in Turkey. *World Development*. 64, 243–258.

Dursun, B., & Cesur, R. (2016). Transforming lives: the impact of compulsory schooling on

hope and happiness. *Journal of Population Economics*, 29(3), 911-956.
Dursun, B., Cesur, R., & Kelly, I. R. (2017). The Value of Mandating Maternal Education in a Developing Country. National Bureau of Economic Research (NBER) Working Paper No. 23492.
EUROSTAT. (2000a). Survey on Time Use: Activity Coding List. Final draft. Luxembourg: European Commission.
EUROSTAT. (2000b). Guidelines on Harmonized European Time Use Surveys Luxembourg: European Commission.
Fiorini, M., & Keane, M. (2014). How the Allocation of Children's Time Affects Cognitive and Noncognitive Development. *Journal of Labor Economics*, 32(4), 787-836.
Fort, M., Schneeweis, N., & Winter-Ebmer, R. (2016). Is Education Always Reducing Fertility? Evidence from Compulsory Schooling Reforms. *The Economic Journal*, 126(595): 1823–1855.
Fort, M., Ichino, A., and Zanella, G. (2020). Cognitive and noncognitive costs of day care at age 0-2 for children in advantaged families. *Journal of Political Economy*, 128(1):158 205.
Gauthier, A., Smeedeng, T., & Furstenberg, F. (2004). Are Parents Investing Less Time in Children? Trends in Selected Industrialized Countries. *Population and Development Review*, 30(4), 647-671.
Ginsberg, H.P. (2006). *Mathematical play and playful mathematics: A guide for early education*. In Singer et al., op. cit. (pp. 145-165).
Gunderson, E. A., Gripshover, S. J., Romero, C., Dweck, C. S., Goldin-Meadow, S., Levine, S. C. (2013). Parent praise to 1- and 3- year olds predicts children's motivational frameworks 5 years later. *Child Development*, 84, 1526–1541.
Guryan, J., Hurst, E., & Kearney, M. (2008). Parental Education and Parental Time with Children. *Journal of Economic Perspectives*, 22 (3): 23-46.
Gulesci, Selim, Erik Meyersson and Sifia Trommlerova, 2020. "The Effect of Compulsory Schooling Expansion on Mother's Attitudes Toward Domestic Violence in Turkey." World Bank Economic Review, 34(2): 464-484.
Güleşçi, Selim, and Erik Meyersson. 2013. "'For the Love of the Republic': Education, Secularism, and Empowerment." Working Paper no. 490. Innocenzo Gasparini Inst. Econ. Res., Bocconi Univ., Milan.
Güneş, P.M. (2015). The role of maternal education in child health: Evidence from a compulsory schooling law. *Economics of Education Review*, 47: 1–16.
Güneş, P. (2016). The Impact of Female Education on Teenage Fertility: Evidence from Turkey, *The B.E. Journal of Economic Analysis & Policy*, vol. 16, no. 1, 2016, pp. 259-288. https://doi.org/10.1515/bejeap-2015-0059
Hart, B., & Risley, T. R. (1995). Meaningful differences in the everyday experience of young American children. Baltimore, MD: Paul H. Brookes Publishing Company.
Heckman, J.J. (2006). Skill formation and the economics of investing in disadvantaged children. *Science*, 312:1900–1902.
Heckman, J. J., Moon, S. H., Pinto, R., Savelyev, P. A., & Yavitz, A. (2010). The Rate of Return to the High/Scope Perry Preschool Program. *Journal of public economics*, 94(1-2), 114–128.
Heckman, J. J., & Karapakula, G. (2019). The Perry Preschoolers at Late Midlife: A Study in Design-Specific Inference Working Paper 2019-034, Human Capital and Economic Opportunity Global Working Group
Herbst, C.M. (2013). 'The impact of non-parental child care on child development: evidence from the summer participation, *Journal of Public Economics*, vol. 105, pp. 86 105.
Hernández-Alava, M., & Popli, G. (2017). Children's Development and Parental Input: Evidence from the UK Millennium Cohort Study. *Demography*, 54(2):485-511.
Hill, C., & Stafford, F. (1980). Parental Care of Children: Time Diary Estimates of Quantity, Predictability, and Variety. *The Journal of Human Resources*, 15(2), 219-239.
Hsin, A., & Felfe, C. (2014). When does time matter? maternal employment, children's time with parents, and child development. *Demography*, 51(5), 1867–1894.

Hurtado, N., Marchman, V. A., & Fernald, A. (2008). Does input influence uptake? Links between maternal talk, processing speed and vocabulary size in Spanish-learning children. *Developmental science*, 11(6), F31–F39.

Hofferth, S.L., & Sandberg, J.F. (2001). How American Children Spend Their Time. *Journal of Marriage and Family, 63*, 295-308.

Kalb, G., & van Ours, J. C. (2014). Reading to young children: A head-start in life?. *Economics of Education Review*, 40, 1–24.

Kırdar, M.G., Dayıoğlu, M., & Koç, İ. (2018). The Effects of Compulsory-Schooling Laws on Teenage Marriage and Births in Turkey. *Journal of Human Capital*, 12(4), 640-668.

McCrary, J., & Royer, H. (2011). The effect of female education on fertility and infant health: evidence from school entry policies using exact date of birth. *American Economic Review*, 101, 158–195.

Mol, S.E., & A.G. Bus (2011). To Read or Not to Read: A Meta-Analysis of Print Exposure From Infancy to Early Adulthood. *Psychological Bulletin*, 137, 267–296.

Leibowitz, A. (1977). Parental inputs and children's achievement. *Journal of Human Resources*, 12 (2), 242–251.

Leon, A., (2004). The Effect of Education on Fertility: Evidence from Compulsory Schooling Laws, Working Paper, University of Pittsburgh.

Price, J. (2008). "Parent Child Quality Time: Does Birth Order Matter?" *Journal of Human Resources*. 43 (1):240–65.

Reed, J. & Hirsh-Pasek, K. & Golinkoff, RM.(2017). Learning on hold: Cell phones sidetrack parent-child interactions. *Dev Psychol*. 53(8):1428-1436

Reynolds, A. J., Temple, J. A., Ou, S. R., Arteaga, I. A., & White, B. A. (2011). School-based early childhood education and age-28 well-being: effects by timing, dosage, and subgroups. *Science* (New York, N.Y.), 333(6040), 360–364.

Salehi-Isfahani, D. & Taghvatalab, S. (2019). Education and the allocation of time of married women in Iran. *Review of Economics of the Household*. 17, 889–921

Sayer, L., Gauthier, A., & Furstenberg, F. (2004). Educational Differences in Parents' Time with Children: Cross-National Variations, *Journal of Marriage and Family*, 66(5), 1152-1169.

Sayer, L., Bianchi, S., & Robinson, J. (2004). Are Parents Investing Less in Children? Trends in Mothers' and Fathers' Time with Children. *American Journal of Sociology, 110*(1), 1-43.

Shneidman, L.A., Arroyo, M.E., Levine, S.C., & Goldin-Meadow, S. (2013). What counts as effective input for word learning?. *J Child Lang*, 40(3):672-686.

Torun, H., (2018). Compulsory Schooling and Early Labor Market Outcomes in a Middle Income Country. *Journal of Labor Research*, 1-29.

OECD (2020), Education at a Glance 2020: OECD Indicators, OECD Publishing, Paris, https://doi.org/10.1787/69096873-en.

Özer, M., Fidrmuc, J., & Eryurt, M.A. Maternal education and childhood immunization in Turkey. Health Econ. 2018;27(8):1218–29.

Pleck, J. H. (1997). Paternal involvement: Levels, sources, and consequences. In M. E. Lamb (Ed.), *The role of the father in child development* (pp. 66–103). John Wiley & Sons Inc.

United Nations Children's Fund, A World Ready to Learn: Prioritizing quality early childhood education, UNICEF, New York, April 2019.

Usta, E. K. (2020). Effects of Maternal Education on Early Nonmonetary Investments in Child Development. Journal of Human Capital, 14(4), 535- 583.

Yogman, M., Garner, A., Hutchinson, J., Hirsh-Pasek, K., Golinkoff, R.M. & Committee On Psychosocial Aspects of Child and Family Health; Council On Communications and Media. (2018). The Power of Play: A Pediatric Role in Enhancing Development in Young Children. *Pediatrics*. 2018 Sep;142(3).

Weisleder, A., & Fernald, A. (2013). Talking to Children Matters: Early Language Experience Strengthens Processing and Builds Vocabulary. *Psychological Science*, 24(11), 2143-2152.

Zick, Cathleen D., & Bryant, W. Keith. (1996). A New Look at Parents' Time Spent in Child Care: Primary and Secondary Time Use. *Social Science Research,* 25(3): 260 –280.

TABLES AND FIGURES

TABLE 1: Descriptive Statistics

	(1)	(2)	(3)
VARIABLES	All	Treatment	Control
PANEL A: Background Information			
Age	29.01	25.52	31.86
	(1.754)	(3.575)	(1.586)
Middle School	0.584	0.699	0.491
	(0.501)	(0.493)	(0.460)
High School	0.399	0.382	0.413
	(0.493)	(0.490)	(0.487)
College	0.201	0.143	0.249
	(0.433)	(0.401)	(0.351)
PANEL B: Labor Market Outcomes			
Employment	0.208	0.176	0.234
	(0.424)	(0.406)	(0.382)
Weekly Hours Worked	7.949	6.592	9.054
	(16.73)	(15.54)	(17.59)
Higher than Minimum Wage*	0.742	0.686	0.774
	(0.422)	(0.440)	(0.471)
PANEL C: Early Childhood Care Outcomes			
Time Spent *(in min. per week)*	301.5	331.9	276.8
	(357.7)	(370.6)	(384.2)
Participation *(per week)*	0.678	0.702	0.659
	(0.468)	(0.458)	(0.475)
PANEL D: Children's Background Information			
Number of Total Children	2.188	1.831	2.479
	(1.272)	(1.013)	(1.383)
Number of Children aged 0-2	1.068	1.070	1.066
	(0.264)	(0.255)	(0.272)
Age of First-Born Child	5.429	3.537	6.970
	(4.635)	(4.309)	2.921
Age of Last-Born Child	1.051	0.945	1.138
	(0.770)	(0.762)	(0.739)
Observations	606	272	334

Notes: Table shows the mean, standard deviation, and the number of observations from 2014-2015 Turkish Time Use Survey data. Column (1), (2), and (3) report the results for all mothers who have at least one child under the age of 3, in the treatment group, and in the control group, respectively. The treatment group consists of married mothers born between 1987 and 1992, and the control group consists of those born between 1980 and 1985. The 1986 cohort is excluded. *Employment* is a dependent variable that takes the value 1 if the respondent works for one hour with/without receiving payment during the last week or the respondent is temporarily unemployed, and 0 otherwise. *Weekly Hours Worked* is a dependent variable that takes the value worker's hours worked in a week at the main job and side job if married mother is employed, and 0 otherwise. *Higher than Minimum Wage* is a dummy variable that takes the value 1 if monthly/daily paid respondent's wage group is in the higher than minimum wage groups, takes the value 0 if monthly/daily paid respondents' wage group is in the lowest wage group. * *Higher than Minimum Wage* are calculated for employed mothers. Standard deviations are in the parenthesis.

TABLE 2: The Impact of Exposure to the Education Reform on Sample Selection and Fertility

	(1)	(2)	(3)	(4)
	QUADRATIC TIME TREND[ξ]	**LINEAR TIME TREND**		
Bandwidth	**8**	**7**	**6**	**5**
Dependent Variables:				
PANEL A: All women				
Married	0.015	0.036	0.020	0.034
	(0.058)	(0.033)	(0.036)	(0.043)
Observations	3,583	3,128	2,674	2,213
PANEL B: All married women				
Mother	-0.057	0.015	0.033	-0.004
	(0.061)	(0.039)	(0.044)	(0.046)
Observations	2,505	2,236	1,937	1,626
PANEL C: All married mothers				
Mother with at least one child aged between 0-2	-0.044	-0.011	-0.042	-0.038
	(0.090)	(0.054)	(0.057)	(0.062)
Number of Children	-0.237	-0.008	-0.005	-0.130
	(0.158)	(0.102)	(0.105)	(0.114)
Age at First Birth	0.530	0.076	-0.042	0.291
	(0.587)	(0.353)	(0.387)	(0.397)
Observations	1,976	1,759	1,518	1,285

Notes: Reform is a binary variable equal to 1 if the individual was born between 1987 and 1992, and equal to 0 if the individual was born between 1980 and 1985. The 1986 cohort is excluded.[ξ]At bandwidth level 8, the split quadratic time trends are added as control variables into regressions. The control variables include the survey-month fixed effects, the survey-year fixed effects, the region of residence fixed effects, re-centered birth $year_{tre}$, and re-centered birth $year_{cont,}$. The entries in the parentheses are the standard error of the estimated coefficients, clustered by the region by the birth cohort level. ***, **, * indicate significance at %1, %5, and %10, respectively.
Source: 2014-2015 Turkish Time Use Survey, TURKSTAT

TABLE 3: The Impact of Exposure to the Education Reform on Educational Outcomes

	(1)	(2)	(3)
	Middle School	High School	College
Variables			
	PANEL A: Mothers		
Reform	0.200***	0.027	-0.018
	(0.073)	(0.075)	(0.068)
Observations		606	
	PANEL B: All Women		
Reform	0.121***	0.015	0.026
	(0.030)	(0.041)	(0.038)
Observations		2,674	

Notes: Reform is a binary variable equal to 1 if the individual was born between 1987 and 1992, and equal to 0 if the individual was born between 1980 and 1985. The 1986 cohort is excluded. The dependent variable, *Middle School,* is a binary variable equal to 1 if the individual completes at least middle school and 0 otherwise. The control variables include the survey-month fixed effects, the survey-year fixed effects, the region of residence fixed effects, re-centered birth $year_{tre}$, and re-centered birth $year_{cont.,}$ total number of children, the age of the first-born child, and the age of last-born child. Standard errors are clustered at the region by the birth cohort level. ***, **, * indicate significance at %1, %5, and %10, respectively.
Source: 2014-2015 Turkish Time Use Survey, TURKSTAT

TABLE 4: The Impact of Exposure to the Education Reform on Early Childhood Care Outcomes

	(1)	(2)	(3)	(4)
	QUADRATIC TIME TREND$^{\xi}$	**LINEAR TIME TREND**		
Bandwidth	**8**	**7**	**6**	**5**
Variables				
PANEL A: Time Spent (in min. per week)				
Reform	26.405	-26.978	-27.271	5.854
	(99.754)	(56.799)	(66.571)	(68.661)
	[0.781]	[0.671]	[0.746]	[0.953]
PANEL B: Participation (per week)				
Reform	0.003	-0.018	0.002	0.001
	(0.117)	(0.067)	(0.076)	(0.082)
	[0.976]	[0.778]	[0.974]	[0.991]
Observations	726	678	606	539

Notes: Reform is a binary variable equal to 1 if the mother was born between 1987 and 1992, and equal to 0 if the mother was born between 1980 and 1985. The 1986 cohort is excluded. $^{\xi}$At bandwidth level 8, the split quadratic time trends are added as control variables into regressions. The control variables include the survey-month fixed effects, the survey-year fixed effects, the region of residence fixed effects, re-centered birth $year_{tre}$, and re-centered birth $year_{cont,}$ total number of children, the age of the first-born child, and the age of last-born child. The entries in the parentheses are the standard error of the estimated coefficients, clustered by the region by the birth cohort level. ***, **, * indicate significance at %1, %5, and %10, respectively. P-values related to bootstrapped standard errors, clustered by the birth cohort level, are given in brackets.
Source: 2014-2015 Turkish Time Use Survey, TURKSTAT

APPENDIX

Figure 1. *Proportion of Mothers with At Least Middle School Diploma in 2014-2015 by Birth Cohorts 1980 to 1992*

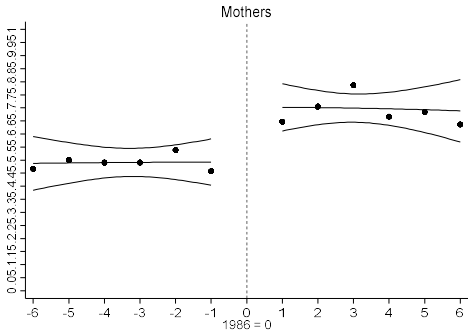

Figure 2. *Average Time Spent in Playing with Children, Reading and Talking to Children (in min. per week) by Birth Cohorts 1980 to 1992*

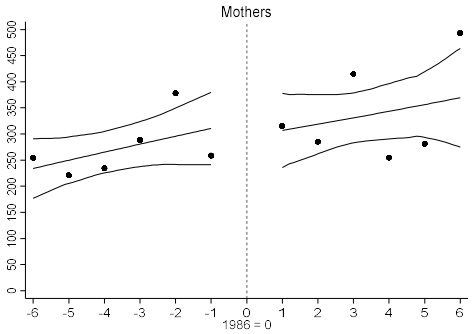

Figure 3. *Average Proportion of Individuals Playing with Children, Reading and Talking to Children by Birth Cohorts 1980 to 1992*

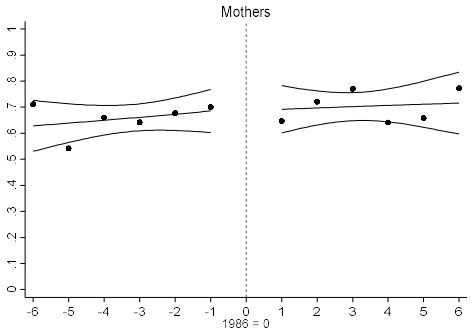

TABLE B.1: The Impact of Exposure to the Education Reform on Husband's Characteristics

	(1)	(2)	(3)	(4)
	QUADRATIC TIME TREND[ξ]	**LINEAR TIME TREND**		
Bandwidth	**8**	**7**	**6**	**5**
Dependent Variable:				
Husband education	0.311**	0.244***	0.284***	0.218***
	(0.120)	(0.072)	(0.072)	(0.078)
Husband age	-0.543	-0.255	-0.439	-0.779
	(0.980)	(0.595)	(0.639)	(0.731)
Observations	680	636	572	511

Notes: Reform is a binary variable equal to 1 if the mother was born between 1987 and 1992, and equal to 0 if the mother was born between 1980 and 1985. The 1986 cohort is excluded. *Husband education* is a dependent variable that that takes value 1 if the mothers' husband has at least middle school degree, and 0 otherwise. [ξ]At bandwidth level 8, the split quadratic time trends are added as control variables into regressions. The control variables include the survey-month fixed effects, the survey-year fixed effects, the region of residence fixed effects, re-centered birth $year_{tre}$, and re-centered birth $year_{cont,}$ total number of children, the age of the first-born child, and the age of last-born child. Standard errors are clustered at the region by the birth cohort level. ***, **, * indicate significance at %1, %5, and %10, respectively.
Source: 2014-2015 Turkish Time Use Survey, TURKSTAT

TABLE B.2: The Impact of Exposure to the Education Reform on the Number of Children and the Age of Child

	(1)	(2)	(3)	(4)
Dependent Variables:	Number of Children under age of 3	Total Number of Children	Age of First-Born Child	Age of Last-Born Child
Reform	-0.057	0.016	0.205	-0.069
	(0.042)	(0.197)	(0.620)	(0.159)
Observations		606		

Notes: *Reform* is a binary variable equal to 1 if the mother was born between 1987 and 1992, and equal to 0 if the mother was born between 1980 and 1985. The 1986 cohort is excluded. Total Number of Children, Number of Children under age of 3, age of the first-born child, age of last-born child are dependent variables. The control variables include the survey-month fixed effects, the survey-year fixed effects, the region of residence fixed effects, re-centered birth $year_{tre}$, and re-centered birth $year_{cont.}$ Standard errors are clustered at the region by the birth cohort level. ***, **, * indicate significance at %1, %5, and %10, respectively.
Source: 2014-2015 Turkish Time Use Survey, TURKSTAT

TABLE B.3: The Impact of Exposure to the Education Reform on Labor Market Outcomes of Mothers

	(1)	(2)	(3)	(4)
	QUADRATIC TIME TREND[ξ]		**LINEAR TIME TREND**	
Bandwidth	**8**	**7**	**6**	**5**
Dependent Variable				
Employment	0.182	0.042	0.082	0.099
	(0.114)	(0.066)	(0.071)	(0.080)
Weekly Hours Worked (*0s included*)	7.240	1.282	3.058	3.674
	(4.579)	(2.652)	(2.820)	(3.151)
Observations	726	678	606	539
High Wage	0.339	-0.003	0.033	0.209
	(0.345)	(0.184)	(0.216)	(0.224)
Observations	106	102	97	87

Notes: Reform is a binary variable equal to 1 if the mother was born between 1987 and 1992, and equal to 0 if the mother was born between 1980 and 1985. The 1986 cohort is excluded. [ξ]At bandwidth level 8, the quadratic time trends are added as control variables into regressions. *Employment* is a dependent variable that takes the value 1 if the respondent works for one hour with/without receiving payment during the last week or the respondent is temporarily unemployed, and 0 otherwise. *Weekly Hours Worked* is a dependent variable that takes the value worker's hours worked in a week at the main job and side job if married mother is employed, and 0 otherwise. *Higher than Minimum Wage* is a dependent variable that takes the value 1 if monthly/daily paid respondent's wage group is in the higher than minimum wage groups, takes the value 0 if monthly/daily paid respondents' wage group is in the lowest wage group. The control variables include the survey-month fixed effects, the survey-year fixed effects, the region of residence fixed effects, re-centered birth $year_{tre}$, and re-centered birth $year_{cont,}$ total number of children, the age of the first-born child, and the age of last-born child. Standard errors are clustered at the region by the birth cohort level. ***, **, * indicate significance at %1, %5, and %10, respectively.
Source: 2014-2015 Turkish Time Use Survey, TURKSTAT

TABLE B.4: The Impact of Exposure to the Education Reform on Stay-at-Home mothers' Early Childhood Care Outcomes

	(1)	(2)	(3)	(4)
	QUADRATIC TIME TREND[ξ]	**LINEAR TIME TREND**		
Bandwidth	**8**	**7**	**6**	**5**
Variables				
PANEL A: Time Spent (in min. per week)				
Reform	58.726	-20.338	-15.973	14.866
	(102.748)	(61.173)	(71.385)	(73.565)
	[0.674]	[0.807]	[0.885]	[0.914]
PANEL B: Participation (per week)				
Reform	-0.021	-0.025	-0.008	-0.024
	(0.132)	(0.074)	(0.085)	(0.093)
	[0.893]	[0.727]	[0.940]	[0.876]
Observations	580	542	480	425

Notes: Stay-at-Home mothers represent all mothers who are not working for one hour with/without receiving payment during the last week. *Reform* is a binary variable equal to 1 if the mother was born between 1987 and 1992, and equal to 0 if the mother was born between 1980 and 1985. The 1986 cohort is excluded. [ξ]At bandwidth level 8, the split quadratic time trends are added as control variables into regressions. The control variables include the survey-month fixed effects, the survey-year fixed effects, the region of residence fixed effects, re-centered birth $year_{tre}$, and re-centered birth $year_{cont,}$ total number of children, the age of the first-born child, and the age of last-born child. The entries in the parentheses are the standard error of the estimated coefficients, clustered by the region by the birth cohort level. ***, **, * indicate significance at %1, %5, and %10, respectively. P-values related to bootstrapped standard errors, clustered by the birth cohort level, are given in brackets.
Source: 2014-2015 Turkish Time Use Survey, TURKSTAT

TABLE B.5: The Impact of Exposure to the Education Reform on Time Spent in Reading to Children, Playing with Children, and Talking to Children (in min. per week)

	(1)	(2)	(3)	(4)
	QUADRATIC TIME TREND$^{\xi}$	**LINEAR TIME TREND**		
Bandwidth	**8**	**7**	**6**	**5**
Variables				
PANEL A: Mothers with at least one child aged between 0-6				
Reform	-14.008	-38.831	-36.099	-19.811
	(64.633)	(37.025)	(41.751)	(43.477)
Observations	1,486	1,362	1,214	1,060
PANEL B: Mothers with at least one child aged between 0-4				
Reform	-37.259	-57.617	-59.020	-28.902
	(75.608)	(43.857)	(49.636)	(52.999)
Observations	1,156	1,072	949	837

Notes: Reform is a binary variable equal to 1 if the mother was born between 1987 and 1992, and equal to 0 if the mother was born between 1980 and 1985. The 1986 cohort is excluded. $^{\xi}$At bandwidth level 8, the split quadratic time trends are added as control variables into regressions. The control variables include the survey-month fixed effects, the survey-year fixed effects, the region of residence fixed effects, re-centered birth $year_{tre}$, and re-centered birth $year_{cont,}$ total number of children, the age of the first-born child, and the age of last-born child. The entries in the parentheses are the standard error of the estimated coefficients, clustered by the region by the birth cohort level. ***, **, * indicate significance at %1, %5, and %10, respectively.
Source: 2014-2015 Turkish Time Use Survey, TURKSTAT

TABLE B.6: The Impact of Exposure to the Education Reform on Husband's Time Spent in Early Childhood Care (in min. per week)

	(1)	(2)	(3)	(4)
	QUADRATIC TIME TREND[ξ]	**LINEAR TIME TREND**		
Bandwidth	**8**	**7**	**6**	**5**
Dependent Variable:				
Playing with Children, Reading and Talking to Children	-0.225	-56.342	-27.801	-25.757
	(76.560)	(41.750)	(45.537)	(50.931)
Educational Activities Accompanied by Children	-3.881	-1.623	0.741	-3.086
	(5.421)	(2.903)	(4.281)	(2.710)
Observations	680	636	572	511

Notes: Reform is a binary variable equal to 1 if the mother was born between 1987 and 1992, and equal to 0 if the mother was born between 1980 and 1985. The 1986 cohort is excluded. [ξ]At bandwidth level 8, the split quadratic time trends are added as control variables into regressions. The control variables include the survey-month fixed effects, the survey-year fixed effects, the region of residence fixed effects, re-centered birth $year_{tre}$, and re-centered birth $year_{cont,}$ total number of children, the age of the first-born child, and the age of last-born child. Standard errors are clustered at the region by the birth cohort level. ***, **, * indicate significance at %1, %5, and %10, respectively.
Source: 2014-2015 Turkish Time Use Survey, TURKSTAT

TABLE B.7: The Impact of Exposure to the Education Reform on Other Child Care Outcomes

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variables:	Main Outcome variable	Physical Child Care	Supervisory Child Care	Traveling with Child	Other Child Care Activities	Total Child Care
PANEL A: Time Spent (in min. per week)						
Reform	-27.271	134.595	-11.306*	-27.649**	-89.338**	-20.968
	(66.571)	(104.800)	(5.786)	(12.068)	(42.156)	(122.542)
PANEL B: Participation (per week)						
Reform	0.002	0.020	-0.091**	-0.047	-0.121	0.007
	(0.076)	(0.031)	(0.045)	(0.056)	(0.083)	(0.022)
Observations	606					

Notes: *Reform* is a binary variable equal to 1 if the mother was born between 1987 and 1992, and equal to 0 if the mother was born between 1980 and 1985. The 1986 cohort is excluded. The control variables include the survey-month fixed effects, the survey-year fixed effects, the region of residence fixed effects, re-centered birth $year_{tre}$, and re-centered birth $year_{cont,}$ total number of children, the age of the first-born child, and the age of last-born child. Standard errors are clustered at the region by the birth cohort level. ***, **, * indicate significance at %1, %5, and %10, respectively.
Source: 2014-2015 Turkish Time Use Survey, TURKSTAT

TABLE B.8: The Impact of Maternal Education on Early Childhood Care Outcomes

	(1)	(2)	(3)	(4)
	QUADRATIC TIME TREND$^{\xi}$	**LINEAR TIME TREND**		
Bandwidth	**8**	**7**	**6**	**5**
Variables				
PANEL A: Time Spent (in min. per week)				
Middle School	106.336***	105.226***	112.737***	112.044***
	(28.087)	(29.728)	(31.667)	(34.732)
PANEL B: Participation (per week)				
Middle School	0.085**	0.076*	0.089**	0.108**
	(0.038)	(0.039)	(0.042)	(0.045)
Observations	726	678	606	539

Notes: Middle School is a binary variable equal to 1 if the individual completes at least middle school, and 0 otherwise. The sample consists of individuals born between 1980 and 1992. The 1986 cohort is excluded. $^{\xi}$At bandwidth level 8, the split quadratic time trends are added as control variables into regressions. The control variables include the survey-month fixed effects, the survey-year fixed effects, the region of residence fixed effects, re-centered birth year$_{tre}$, and re-centered birth year$_{cont,}$ total number of children, the age of the first-born child, and the age of last-born child. Standard errors are clustered at the region by the birth cohort level. ***, **, * indicate significance at %1, %5, and %10, respectively.
Source: 2014-2015 Turkish Time Use Survey, TURKSTAT

TABLE B.9: The Impact of Exposure to the Education Reform on Activities Accompanied by Children

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent Variables:	Educational Activities	Eating	House cleaning	Socializing with family	Celebrating events	Sports and Outdoor activities	All Activities
PANEL A: Time Spent (in min. per week)							
Reform	-3.098	91.198*	32.020**	21.234**	18.145*	-26.509**	520.051*
	(6.850)	(46.595)	(15.850)	(8.540)	(10.054)	(12.620)	(300.008)
PANEL B: Participation (per week)							
Reform	-0.008	0.072	0.098**	0.073	0.038	-0.031	0.029
	(0.036)	(0.068)	(0.045)	(0.057)	(0.030)	(0.032)	(0.035)
Observations				606			

Notes: *Reform* is a binary variable equal to 1 if the mother was born between 1987 and 1992, and equal to 0 if the mother was born between 1980 and 1985. The 1986 cohort is excluded. The control variables include the survey-month fixed effects, the survey-year fixed effects, the region of residence fixed effects, re-centered birth year$_{tre}$, and re-centered birth year$_{cont,}$ total number of children, the age of the first-born child, and the age of last-born child. Standard errors are clustered at the region by the birth cohort level. ***, **, * indicate significance at %1, %5, and %10, respectively.
Source: 2014-2015 Turkish Time Use Survey, TURKSTAT

TABLE B.10. The Impact of Placebo Education Reform on Time Spent in Reading to Children, Playing with Children, and Talking to Children (*in min. per week*)

	(1)	(2)
	PANEL A: First Stage	**PANEL B: Reduced Form Regressions**
Dependent Variables:	Middle School	Time Spent
Placebo Reform	0.020	69.143
	(0.113)	(67.202)
F-statistics	0.03196	
Observations	334	

Notes: The sample consists of mothers born between 1980 and 1985, where the placebo treatment group consists of mothers born between 1983 and 1985, and the placebo control group consists of those born between 1980 and 1982. The control variables include the survey-month fixed effects, the survey-year fixed effects, the region of residence fixed effects, re-centered birth $year_{placebo\text{-}tre}$, and re-centered birth $year_{placebo\text{-}cont,}$ total number of children, the age of the first-born child, and the age of last-born child. Standard errors are clustered at the region by the birth cohort level. ***, **, * indicate significance at %1, %5, and %10, respectively.
Source: 2014-2015 Turkish Time Use Survey

TABLE B.11: The Impact of Exposure to the Education Reform on Time Spent in Reading to Children, Playing with Children, and Talking to Children (*in min. per week*)

	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Sample Specifications:	Including 1986 birth cohort	Alternative Reform Specification 1	Alternative Reform Specification 2	Restrict to sample those who do not receive child care from others$^{\phi}$	Restrict sample to mother who have at least one child under the age of 3 but not have a child older than 9$^{\phi}$
Variables					
Reform	-26.506	-21.611	-25.350	-7.512	-82.087
	(59.918)	(65.204)	(66.083)	(70.570)	(74.992)
Observations	672			524	505

Notes: Reform is a binary variable equal to 1 if the mother was born between 1987 and 1992, and equal to 0 if the mother was born between 1980 and 1985. $^{\phi}$The 1986 cohort is excluded. *Alternative Reform Specification 1* is the alternative construction of the binary variable, *Reform*, where it takes the value 1 if the mother was born between 1987 and 1992, takes the value 0 if the individual was born between 1980 and 1985, and takes the value 0.5 if the respondent was born in 1986. *Alternative Reform Specification 2* is the alternative construction of the binary variable, *Reform*, where it takes the value 1 if the mother was born between 1987 and 1992, takes the value 0 if the mother was born between 1980 and 1985, and takes the value 0.33 if the respondent was born in 1986. The control variables include the survey-month fixed effects, the survey-year fixed effects, the region of residence fixed effects, re-centered birth $year_{tre}$, and re-centered birth $year_{cont,}$ total number of children, the age of the first-born child, and the age of last-born child. Standard errors are clustered at the region by the birth cohort level. ***, **, * indicate significance at %1, %5, and %10, respectively.
Source: 2014-2015 Turkish Time Use Survey

TABLE B.12. The Impact of Education Reform on the probability of Time Allocated to Child Care Activities

(for the sample of Usta (2020))

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent Variables:	Main Outcome Variable	Total Child Care	Child Care Measure 1	Child Care Measure 2	Child Care Measure 3	Child Care Measure 4	All Activities Accompanied by Children
PANEL A: Mothers born between 1982 and 1991							
Reform	-0.077	0.017	0.046	0.042*	0.041*	0.044**	0.018
	(0.076)	(0.027)	(0.032)	(0.024)	(0.022)	(0.022)	(0.027)
Observation				843			
PANEL B: Mothers born between 1983 and 1990							
Reform	-0.112	0.017	0.061*	0.045*	0.041*	0.041*	-0.007
	(0.090)	(0.027)	(0.035)	(0.025)	(0.024)	(0.024)	(0.035)
Observations				685			

Notes: The sample includes ever-married mothers whose last child under the age of 5. *Reform* is a binary variable equal to 1 if the mother was born after 1986, and equal to 0 if the mother was born before 1986. The 1986 cohort is excluded. *Child Care measure 1* excludes time spent in playing with children, and talking and reading to children from time spent in total child care activities. *Child Care measure 2* includes time spent in total child care (exc.time spent in playing with children, reading and talking to children) as well as eating accompanied by children. *Child Care Measure 3* includes time spent in child care measure 2 as well as leisure activities accompanied by children (reading, listening to music, sports and outdoor activities, social activities, art and hobby activities, computer based activities). *Child Care Measure 4* includes time spent in child care measure 3 as well as household care activities accompanied by children. The control variables include the survey-month fixed effects, the survey-year fixed effects, the region of residence fixed effects, re-centered birth $year_{tre}$, and re-centered birth $year_{cont,}$, total number of children, the age of the first-born child, and the age of last-born child. Standard errors are clustered at the region by the birth cohort level. ***, **, * indicate significance at %1, %5, and %10, respectively.

Source: 2014-2015 Turkish Time Use Survey

Table B.13. The Composition of Alternative Child Care Measures

Variables	Child Care Measure 1	Child Care Measure 2	Child Care Measure 3	Child Care Measure 4
Playing with Children, Reading and Talking to Children	-	-	-	-
Physical Child Care	x	x	x	x
Supervisory Child Care	x	x	x	x
Traveling with Child	x	x	x	x
Other Child Care Activities	x	x	x	x
Eating accompanied by Children		x	x	x
Leisure activities accompanied by children (*listening to music, sports and outdoor activities, reading, social activities, art and hobby activities, computer based activities*)			x	
Household care activities accompanied by children				x