

Gender Roles and the Education Gender Gap in Turkey

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In Turkey, 7% of girls between ages 8 and 12 never make it to school, compared with 2% of boys. By age 15, female enrolment is almost twenty percentage points below male enrolment (UNESCO, 2010). In tertiary education, as of 2009, 77 women were enrolled for each 100 men, which is substantially lower than the European Union average of 124 women for every 100 men in the same year (Eurostat, 2012). Even among developing countries, Turkey is one of the few countries where a substantial gender gap in education to the detriment of girls still exists (Pekkarinen, 2012).

Differences in gender roles have been offered as an explanation for observed gender differences in educational and labor market outcomes (Bertrand, 2010). A study of 25 OECD countries finds that evaluation of women's sense of self, as measured by agreement with the statements "when jobs are scarce, men should have more right to a job than women" or "being a housewife is just as fulfilling as working for pay", is closely associated with women's labor market outcomes (Fortin, 2005). Many believe that views on gender roles are largely determined early in childhood. In some countries, children grow up in an environment in which son preference is strong (see, for example, Zhang et al. (2007) for China and Stash and Hannum (2001) for Nepal). Even in countries that are not typically considered to have patrilineal family systems, female labor market outcomes may depend on parental views on gender roles. In Australia, females' attitudes towards working women are developed in their youth by their religious affiliation and their parents' education and labor market behavior (Vella, 1994). In the U.S., mothers with less traditional gender values are more likely to have working daughters and daughters-in-law (Farre & Vella, 2012).

In many parts of the world, educational outcomes of women have been improving. In the U.S., women started outnumbering men in graduating from four-year colleges in the 1980s (Goldin, Katz, & Kuziemko, 2006). The number of countries where women have more years of education than men increased from 11 in 1950 to 43 in 2010 in a sample of 146 countries.¹ In 2008, female enrollment in tertiary education was higher than male enrollment in all of the

¹ Such a trend has consequences for the marriage market. A recent study finds higher rates of educational hypergamy (the tendency of women to marry men of higher educational status) in countries where a gender gap in education exists against girls (Esteve, García-Román, & Permanyer, 2012).

OECD countries with the exception of Japan, South Korea, Switzerland, and Turkey, and in some large non-OECD countries such as the Philippines, Iran, and Thailand (Pekkarinen, 2012). In developing countries, girls on average have equal or greater schooling attainment than boys, despite lingering gender gaps in school entry favoring boys (Grant & Behrman, 2010). In Thailand, girls are currently more likely to be enrolled in secondary school than boys, even in agricultural communities. The recent reversal of the country's gender gap in enrollment has been attributed to the absence of a strong gender preference for boys (Korinek & Punpuing, 2012).

In socially conservative parts of Turkey, a traditional view on gender roles prevails. Indeed, several studies that have conducted face-to-face interviews with parents, teachers and local officials in Turkey, report conservative views against girls' education as a major impediment. In four cities of the Black Sea region with low enrollment rates for girls, a concern for girls' chastity, need for girls' labor at home, preference for religious education and early marriages were presented as the main reasons for not educating girls (Alat & Alat, 2011). In a traditional and low-income city (Van), parents stated that low income and social pressure against sending girls to mixed sex schools as the most important reasons for keeping girls out of school. Interestingly, all families in the sample who do not educate their daughters educate their sons (İlhan Tunç, 2009). Conservative views on gender roles also are also reflected in popular discourse. Recently, the Turkish Minister of Health has been quoted to say "Mothers should not put another career other than motherhood at the center of their lives" (Hurriyet Daily News, January 05, 2015).

We start our analyses by documenting school dropout rates across educational stages and examine their association with gender views using nationally representative data from the Turkish Demographic and Health Surveys (TDHS 1998, 2003). For policymakers, it is vital to know at which stages of education the gender gap arises and is the most significant. Using data on individual subjective gender views, we find that sons and daughters of women who think that educating sons is more important than educating daughters are more likely to drop out during and after primary school, and that the effects are stronger for daughters. Therefore, traditional gender roles interfere with girls' education very early in life.

Next, we examine the impact of an extension in the duration of compulsory schooling on the adverse effects of mother's traditional views of gender roles in determining children's educational attainment. Using the education reform in 1997, which increased compulsory schooling from 5 to 8 years, as a natural experiment, we show that although the reform helped reduce school dropout rates across the country, reductions in school dropout rates were similar

for boys and girls within the group of children whose mothers have a traditional view on gender roles. Therefore, we show that the policy definitely benefitted children, but it failed to eliminate the educational gender gap against girls.

There are only two studies analyzing the effects of the education reform on gender gap in education in Turkey. These studies do not consider the association of gender gap in education with views and attitudes on gender roles—the focus of our study. In the first study, the reform has been found to substantially reduce the urban-rural gap in educational attainment, but not the gender gap (Kirdar et al., 2013). The second study by Gulesci and Myersson (2013) finds that the reform resulted in a one-year increase in years of schooling on average among women, but did not increase schooling among men, thereby reducing the gender gap.² Hence the two studies that analyze the effect of the reform on gender gap in education find conflicting results. Our study considers the heterogeneity in social preferences towards educating girls in the Turkish society and aims to analyze the differential impact of the reform for children with mothers holding different views on gender roles. Hence, our study also contributes to reconcile the different findings in the literature about the effect of the education reform on the educational gender gap by considering the differential impact of the reform for households with different social preferences.

Turkey, with its culturally diverse population, provides an excellent environment to study the interaction between gender views and education and the effects of education policies on this interaction. The country combines modernity with traditionalism and it displays a wide spectrum of gender views across its regions, as shown by a gender view indicator based on the degree to which the respondents agree with the statement “when jobs are scarce, men should have more right to a job than women”. The regional averages (NUTS-1 level) of the indicator in Turkey vary between 3.22 in the most gender equal region and 4.12 in the most unequal region. By comparison, the average value of the indicator is about 3.23 in Chile, Romania, Spain and Great Britain, about 3.48 in China and Czech Republic, 3.59 in Russia, 3.78 in India and about 4 in Saudi Arabia and Algeria.³

Sometimes, the insufficient supply of education for girls is a reason for gender differences in educational attainment. In countries where most schools are single-sex, the problem of access to schools can in fact be an issue for girls (Alderman, Behrman, Ross, &

²Dincer et al. (2013) analyze the effect of education reform on fertility and children’s health and find that the reform has had a substantial positive effect on girls’ schooling in their first stage regression. They do not question the effect of the reform on the gender gap.

³Authors’ calculations based on the European Social Survey and the World Values Survey data.

Sabot, 1996). An advantage of studying Turkey is that its mixed-sex education system enables us to control for the effect of resource availability at the regional level on the gender gap in education. Furthermore, with the extension of compulsory schooling, the government made major improvements in schooling infrastructure to ensure universal accessibility, by increasing the number of teachers, building new schools, and adding classrooms. Bussing children to nearby schools and constructing boarding schools increased the supply of education for children living in remote areas. Therefore, in our study resource availability can be assumed to influence the two sexes in the same manner, thereby not show up as an explanatory factor behind the observed gender gap in education. In our case, the crucial factor in determining attainment is the male dominant gender view of parents that acts as a barrier against female education, not school availability.

Compulsory Schooling in Turkey

Ottoman Empire created by Turkish tribes in Anatolia was a Sunni Islamic state that reigned over a large territory including modern day Turkey during 1299-1923. The famous Tanzimat-era Education Regulation of 1869 (Maarif Nizamnamesi), the blue-print for the Empire's first centrally organized and controlled network of schools, was conceptualized during the reign of Sultan Abdulaziz (1861-76), but largely implemented during the reign of Sultan Abdulhamid II (1876-1909). Hamidian government attempted to construct a specifically Ottoman system of public education with a strong Islamic reference. Through a policy of linguistic Turkification and religious Sunnification, the state attempted to homogenize a citizenry loyal to the central authority (Herrera, 2004). In primary schools, girls and boys commonly attended the classes together, but girls and boys separately sat at different desks inside one room. In addition to this, there were schools where only girls or only boys attended (Sonmez, 2013).

Following World War I, the huge conglomeration of territories and peoples that formerly comprised the Ottoman Empire was divided into several new states. Turkish War of Independence 1919-1922 initiated by Mustafa Kemal Ataturk and his colleagues in Anatolia resulted in the establishment of Modern Republic of Turkey in 1923, with Ataturk as its first president. At this time, 90 percent of the population was illiterate. The new Republic established a secular education system and replaced the Arabic alphabet with the Turkish alphabet derived from the Latin Alphabet.

In Turkey, prior to 1997, the students were subject to a 5+3+3 education system with only five years of compulsory primary education, followed by three years of junior high and

three years of high school. With a law change in 1997, compulsory education was increased from five to eight years by merging the first two levels. Children typically start school at age 6 so that the new law required that they remain in school until about age 14. To meet the expected increase in enrollment, the Ministry of National Education constructed 103,983 new basic education classrooms during 1997-2001, raising the total stock to 264,776 (Dulger, 2004). During 1996-2003, 103,000 additional primary school teachers were hired, creating a 36% increase (Dinçer, Kaushal, & Grossman, 2013).

Education statistics prior to 1998 show us the vast gender gap in educational attainment. In 1988, sixteen year-old girls in western, central or northern Turkey were 1.5 to 3 times more likely to graduate from junior high school compared to girls in the least developed east region; for boys, no significant regional differences were observed. Furthermore, girls were found to be less likely to finish junior high school, if their fathers believed in sex segregation or that wives are only good for housework (Aytac & Rankin, 2004). A study, based on 1994 data, reports higher inequality in female enrollment rates across provinces compared to inequality in total enrollment rates, at all levels of schooling (Tansel & Gungor, 2000). In 1998, more than 50% of the girls aged 13–14 were out of school, compared to one-third of the boys; about 16% of girls aged 9–11 were out of school, compared to 7% of boys (Smits & Hoşgör, 2006).

In countries where laws are strictly enforced and the infrastructure is available to keep track of school-aged children, it is not surprising that compulsory education positively influences educational outcomes. Indeed, a sizable literature on compulsory schooling laws finds that the introduction or extension of such laws improves educational attainment. The studies are usually on developed countries⁴. When enforcement or infrastructure is imperfect, such as the case in Turkey, it is likely that some school-age children will not attend school. The educational gender gap in the country has declined since 1998, but there still is a gap to the detriment of girls. Being a boy has been found to increase the probability of completing higher education by 0.16 in 2006 data (Hisarciklilar, McKay, & Wright, 2010). Although eight years of primary education is compulsory since 1997, about 640,000 children of primary school age (6-14), 60% of whom were girls, were out of school in 2007 (UNESCO, 2010). Turkey has achieved universal primary education, but only in the modern western part of the country (Alat & Alat, 2011).

⁴ Such as the U.S. (Angrist & Krueger, 1991) (Acemoglu & Angrist, 2001), Taiwan (Chou, Liu, Grossman, & Joyce, 2010), Britain and Northern Ireland (Oreopoulos, 2006), Britain (Devereux & Hart, 2010), Germany (Kemptner, Jürges, & Reinhold, 2011), the U.S. and Norway (Black, Devereux, & Salvanes, 2008), and 12 European countries (Brunello, Fort, & Weber, 2009)

Data and Descriptive Statistics: Turkey Demographic and Health Surveys (TDHS)

Data on views on gender roles come from the Turkish Demographic and Health Surveys (hereafter TDHS) which were conducted by Hacettepe University of Turkey. TDHS are representative not only at the national level but also at five major regions of the country (the West, South, Central, North, and East). The ever-married women module of TDHS provides data for a wide range of monitoring and impact evaluation indicators related to population, health, nutrition, women's beliefs and attitudes, and children's educational attainment.

For our analyses we make use of the 1998 and 2003 rounds of TDHS. Our measure of view on gender role focuses on the view of mothers on the choice of educational attainment for male and female children. We choose these rounds of TDHS because we would like to study the time period that is close to the 1997 education reform and thereby prevent time trends in gender views from confounding our results. In 1998 and 2003, respectively, 8576 and 8705 women between ages 15 and 49 were asked whether they agree or disagree with the statement: "It is better for the male child to have education than the female child." Responses to this question are coded as agree=1 and disagree=0 to construct our measure of traditional view on gender roles.

Figure 1 shows the share of children enrolled in school by age, gender and mother's view on gender roles in 1998 TDHS. Red color represents female children, blue represents male children. Enrolment rate of children whose mothers have a traditional view on gender roles, i.e. "it is better for the male child to have education than the female child", are represented with dotted-dashed lines, and enrolment rate of children whose mother hold a non-traditional view on gender roles are represented with dotted-solid lines. It can be observed from Figure 1 that maternal attitude on gender role is highly correlated with the gender gap in educational attainment. On average, dropout rates of girls whose mothers favor education of the male child over the female child are much higher than dropout rates of boys at the same age. Moreover, girls whose mothers hold a non-traditional view on gender roles have almost as much chance as boys to stay in school. Mothers' views on gender roles appear not to be very important for the enrolment rate of boys. Last but not least, we observe that the educational disadvantage faced by female children whose mothers hold a traditional view on gender roles increases substantially after the completion of compulsory education, i.e. for those who were 12 or older in 1998.

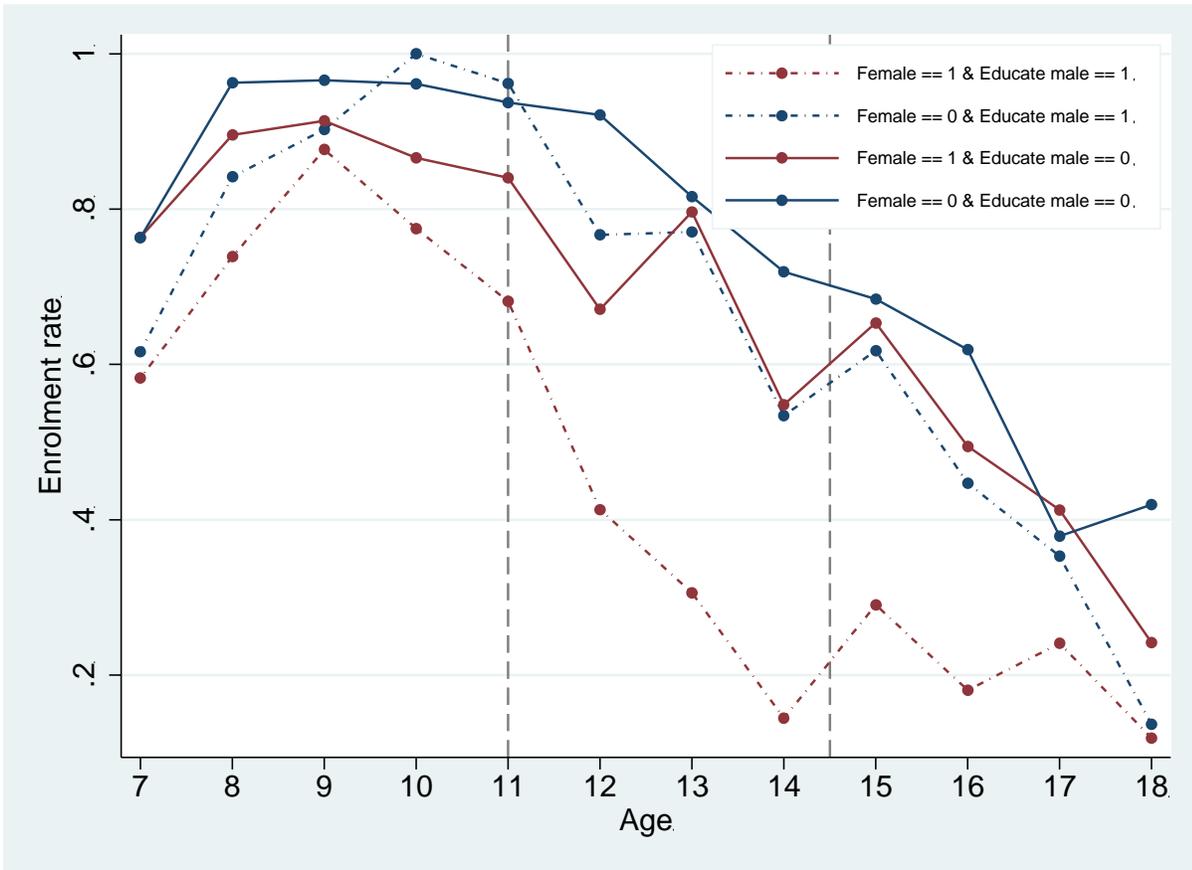


Figure 1: Enrollment rate by age, gender and maternal gender view in TDHS 1998

Table 1: Descriptive Statistics of TDHS Data

	(1)		(2)		(3)	
	TDHS 1998 Mean	SD	TDHS 2003 Mean	SD	TDHS 2003 Mean	SD
<i>Education Outcomes</i>						
Completed primary school	0.91	0.29	0.92	0.26	1.00	0.00
Dropout after primary school	0.33	0.47	0.17	0.38	0.17	0.38
Completed junior high school	0.38	0.49	0.73	0.44	0.80	0.40
Dropout after junior high school	0.13	0.34	0.18	0.39	0.18	0.39
<i>Mother's view on gender roles</i>						
Better to educate male child	0.29	0.46	0.21	0.41	0.20	0.40
<i>Parental characteristics</i>						
Mother's age	39.10	4.86	40.90	4.36	40.95	4.34
Mother's education: No schooling	0.48	0.50	0.40	0.49	0.36	0.48
Mother's education: Primary school	0.42	0.49	0.47	0.50	0.50	0.50
Mother's education: Jun. high school	0.03	0.18	0.04	0.20	0.05	0.21
Mother's education: High school	0.06	0.24	0.09	0.28	0.10	0.29
Mother's mother tongue: Turkish	0.74	0.44	0.72	0.45	0.77	0.42
Mother's mother tongue: Kurdish	0.22	0.42	0.24	0.43	0.19	0.39
Mother's mother tongue: Arabic and other	0.04	0.19	0.04	0.19	0.04	0.19
Mother's education: No schooling	0.16	0.37	0.12	0.33	0.09	0.29
Father's education: Primary school	0.56	0.50	0.55	0.50	0.56	0.50
Father's education: Jun. high school	0.10	0.30	0.11	0.31	0.11	0.32
Father's education: High school	0.17	0.38	0.22	0.42	0.24	0.43
Father's mother tongue: Turkish	0.74	0.44	0.72	0.45	0.76	0.42
Father's mother tongue: Kurdish	0.22	0.42	0.24	0.43	0.20	0.40
Father's mother tongue: Arabic and other	0.04	0.20	0.04	0.19	0.04	0.19
<i>Individual characteristics</i>						
Female	0.49	0.50	0.45	0.50	0.43	0.50
Age	14.71	1.99	16.98	2.21	17.01	2.21
Birth order: 1	0.37	0.48	0.46	0.50	0.46	0.50
Birth order: 2-3	0.49	0.50	0.47	0.50	0.46	0.50
Birth order: 4-6	0.12	0.33	0.07	0.26	0.07	0.25
Birth order: More than 6	0.01	0.12	0.01	0.08	0.01	0.07
Number of siblings: 0	0.19	0.39	0.22	0.42	0.24	0.43
Number of siblings: 3-5	0.53	0.50	0.52	0.50	0.55	0.50
Number of siblings: >6	0.28	0.45	0.25	0.43	0.21	0.40
<i>Household characteristics</i>						
Household wealth quintile: Poorest	0.21	0.41	0.16	0.37	0.12	0.33
Household wealth quintile: Poorer	0.19	0.40	0.19	0.39	0.19	0.39
Household wealth quintile: Middle	0.22	0.42	0.21	0.41	0.22	0.41
Household wealth quintile: Richer	0.20	0.40	0.23	0.42	0.24	0.43
Household wealth quintile: Richest	0.17	0.38	0.21	0.41	0.22	0.42
Urban	0.67	0.47	0.73	0.45	0.74	0.44
N	3471		4174		3839	

Notes: TDHS 1998 sample in Column (1) includes children aged between 12 and 18, living in the same household as the mother. TDHS 2003 sample in Column (2) includes children aged between 12 and 18, living in the same household as the mother. TDHS 2003 sample in Column (3) includes children born between 1982 and 1990, who completed primary school, living in the same household as the mother.

We are interested in investigating the impact of maternal view of gender roles on children's educational attainment. A dichotomous comparison, such as in Figure 1, might be misleading since mother's view might be correlated with other socio-economic characteristics of the mother and the household that are likely to affect the schooling decision. To control for potential confounding covariates, we analyze the impact of mother's view on schooling outcomes of children using regression analyses (see 'Methods and Analyses'). Table 1 describes our measure of mother's view of gender role, educational outcome variables and control variables used in the regression analyses. Column 1 presents descriptive statistics for children aged between 12 and 18 living in the same household as the mother from TDHS 1998. As can be seen from this column, 29 percent of children in our sample have mothers who indicate that it is better to educate sons. 33 percent of children drop out after compulsory primary school.

We use TDHS 1998 and not TDHS 2003 in the first set of regression analyses, because children aged 12-18 in 2003 were born during 1985-1991 and some cohorts in this sample were affected by the change in compulsory schooling law while others were not. Column 2 presents descriptive statistics for the TDHS 2003 sample for comparison reasons. As expected, share of those who drop out after primary school (5 years of schooling) decreases and share of those who drop out after junior high school (8 years of schooling) increases for these cohorts. Other variables remain comparable across the two samples although there are small improvements in parental education, wealth and gender view indicators.

Column 3 presents descriptive statistics for children who *completed primary school* (5 years of schooling), were born during 1982-1990 and live in the same household as the mother. This sample is used in the second set of analyses, where we study the effects of change in compulsory schooling law on gender gap in education. This sample is constructed to provide balanced number of cohorts in the pre- and post-reform period. We observe that 17 percent of children who completed primary school drop out after primary school and 18 percent of children drop out after junior high school (8 years of schooling) in this sample. As expected, parental education and wealth indicators are better in this sample than in the column 2 sample which also includes children who have not completed primary school.

Methods and Analyses

In this study, we mainly test the following hypotheses:

Hypothesis 1: A female child has a lower educational attainment than a male child.

Hypothesis 2: A mother's view on gender roles has a different effect on the educational attainment of her son and her daughter. In particular, the daughter of a woman who holds a traditional view on gender roles achieves lower educational attainment compared to the son of a woman with a similar view.

Hypothesis 3: An extension of compulsory schooling can help reduce the adverse effects of traditional views on gender roles. In particular, it can help close the educational gap between girls and boys.

Mother's View on Gender Roles and the Educational Attainment of her Children

In the first set of analyses, we examine the impact of mothers' view on gender roles on children's schooling outcomes. We estimate the following equation using the TDHS 1998 dataset:

$$S_{ij} = \alpha_0 + \alpha_1 EduMale_{ij} + \alpha_2 Female_{ij} + \alpha_3 EduMale_{ij} * Female_{ij} + \alpha_4 X_{ij} + \alpha r_j + \omega_{ij}, \quad (1)$$

where S_{ij} is the schooling outcome of child i residing in region j . $EduMale_{ij}$ is an indicator variable that takes value of 1 if mother of child i agrees with the statement that "it is important for the male child to have education than the female child", 0 otherwise. We will refer to mothers who agree with this statement as mothers with traditional views and those who do not agree with this statement as mothers with non-traditional views. $Female_{ij}$ is an indicator variable that takes value of 1 if child i is female, 0 otherwise. $EduMale_{ij} * Female_{ij}$ is the interaction term. The vector of controls, X_{ij} , includes number of siblings, birth order, age and age-squared of the child, age and age-squared of the mother, parental education, mother language of the father and mother, wealth quintile (poorest, poorer, middle, richer, richest) and type of residence (urban, rural) of the household. Moreover, r_j is the set of region dummies (West, South, Central, North, and East) that control for cross-regional differences. Standard errors are clustered at the mother level.

Table 2 presents the estimates of equation (1). To be concise, only some of the control variables are shown in the table. In column 1, the dependent variable is equal to 1 if the individual dropped out without completing five years of primary school (compulsory schooling

prior to the 1997 reform), 0 otherwise. In column 2, it is equal to 1 if the individual dropped out after completing primary school, 0 otherwise. In column 3, it is equal to 1 if the individual dropped out after completing junior high school (eight years of schooling), 0 otherwise. We restrict the sample to children aged between 12 and 18 and living in the same household as the mother. The reasons for this decision are twofold. First, children are enrolled in primary school until age 11, and children younger than 12 years old are not supposed to graduate from primary school. Moreover, children aged 12 or older have not been subject to the change in compulsory schooling law in 1997. Second, children tend to leave their parental household after age 18 at a higher speed, for reasons such as marriage and migration to another province for college education. Therefore, we exclude children aged more than 18 to avoid sample selection problem.⁵

Column 1 shows that for boys the mother's view on gender roles does not affect the chance to complete primary school. Yet, being female increases the likelihood of being a primary school dropout by 2.8 percentage points. For girls whose mothers hold a traditional view on gender roles, the probability of completing compulsory schooling level is reduced by 9.5 percentage points (2.8+6.7). In column 2, we investigate the impact of having a mother with traditional view on gender roles on dropping out conditional on completing the primary school. Once again, for boys having a mother who favors the education of male child over female child does not have an impact on the likelihood of dropping out. On the other hand, for girls, whose mothers hold a non-traditional view on gender roles, the chance to continue education after compulsory schooling level is on average 12.8 percentage points lower than it is for boys whose mothers hold a non-traditional view on gender roles. For girls whose mothers hold a traditional view on gender roles, the chance to stay in school after primary school is on average 30.1 percentage points lower than it is for boys whose mothers hold a traditional view on gender roles.

⁵ We only use TDHS 1998 and not TDHS 2003 in this analysis because children aged 12-18 in 2003 were born during 1985-1991 and some cohorts were affected by the change in compulsory schooling law while others were not.

Table 2: Mother's Gender View and Children's Educational Attainment

TDHS 1998	(1) Dropout during primary school	(2) Dropout after primary school	(3) Dropout after junior high school
<i>Mean</i>	[0.09]	[0.33]	[0.13]
Educate male	-0.0182 (1.20)	0.0254 (0.98)	0.0620 (1.65)
Female	0.0279** (2.60)	0.128*** (7.91)	-0.00707 (0.36)
Educate male * Female	0.0670** (2.95)	0.173*** (4.88)	-0.0115 (0.21)
South	-0.0113 (0.82)	-0.0532* (2.15)	-0.0698* (2.51)
Center	-0.00972 (0.85)	-0.0545* (2.24)	-0.0128 (0.44)
North	-0.00935 (0.77)	-0.0735** (2.85)	-0.0664* (2.37)
East	0.0556** (3.02)	-0.0828** (2.87)	-0.0393 (1.16)
Poorer	-0.0831*** (3.81)	-0.107*** (3.38)	0.0480 (0.83)
Middle	-0.114*** (5.26)	-0.251*** (7.85)	-0.0106 (0.21)
Richer	-0.116*** (5.24)	-0.312*** (8.82)	-0.0358 (0.68)
Richest	-0.110*** (4.50)	-0.355*** (9.58)	-0.0623 (1.17)
Mother's education: Primary school	-0.0272* (2.28)	-0.0269 (1.29)	-0.0466 (1.75)
Mother's education: Jun. high school	-0.0289 (1.93)	-0.0816* (2.53)	-0.0209 (0.48)
Mother's education: High school	-0.0127 (0.77)	0.00482 (0.18)	-0.0436 (1.35)
Father's education: Primary school	-0.0513* (2.37)	-0.0910** (3.00)	-0.0303 (0.62)
Father's education: Jun. high school	-0.0822** (3.20)	-0.209*** (5.77)	-0.102 (1.94)
Father's education: High school	-0.0780** (3.28)	-0.231*** (6.74)	-0.0812 (1.59)
Mother's mother tongue: Kurdish	0.0839* (2.10)	0.00821 (0.15)	-0.108* (2.27)
Mother's mother tongue: Arabic and other	0.0495 (0.61)	0.0191 (0.23)	-0.0886 (1.77)
Father's mother tongue: Kurdish	0.0521 (1.34)	0.0226 (0.39)	0.102* (2.03)
Father's mother tongue: Arabic and other	0.00686 (0.09)	0.0728 (0.84)	0.0432 (0.79)
Urban	0.0144 (0.94)	-0.0268 (1.20)	-0.0457 (1.49)
Additional Controls	Yes	Yes	Yes
N	3471	3146	1324
Adjusted R ²	0.202	0.308	0.090

Notes: OLS regressions of Equation (1). Additional controls: age, age-squared/100, number of siblings, mother's age, mother's age-squared/100, father's age, father's age-squared/100. Absolute *t*-statistics are in parentheses and standard errors are clustered at the mother level. **p* < 0.05, ***p* < 0.01, ****p* < 0.001

In column 3, we examine the impact of maternal attitudes on gender roles on dropping out after junior high school. We observe that neither being female nor having a mother who holds a traditional view on gender roles has a statistically significant effect on dropout rates conditional on completing junior high school. With respect to control variables in the table, family wealth, father's and mother's education are negatively associated with the likelihood of dropout during and after primary school. Father's education appears to be more significant and more important (based on the higher absolute value of the coefficient estimate) than mother's education in explaining dropouts.

The Interaction of Compulsory Schooling with Mother's View on Gender Roles

In the second set of analyses, we investigate the impact of the extension of compulsory schooling on the adverse effects of traditional views on gender roles. We exploit an education reform and explore whether the reform helped to mitigate the disadvantage faced by the girls whose mothers favor the education of the male children over the female children.

The 1997 Eight-Year Compulsory Education Enforcement Law (Law no. 4306) and its implementation are discussed in several papers (Dulger İ. , 2004; Kirdar, Dayioglu, & Koc, 2013; Gulesci & Meyersson, 2013; Kirdar, Dayioglu, & Koc, 2012); therefore we present only the main points here. The new law extended compulsory schooling from 5 years (primary school) to 8 years (primary and junior high school), thereby raising the school leaving age from 11 to 14. The law did not specify the ages or birth-cohorts of children it targets. Instead, it required that, as of the beginning of the 1997-1998 school year all children enrolled in grades 1 through 5, and all children who started school in the future, remain in school through completion of the eighth grade (Dulger, 2004). In Turkey, children typically start school at age 6, so we can infer that cohorts born in or after 1987 were subject to the education reform.

To meet the expected increase in demand, the law established a temporary set of earmarked taxes targeted to finance the expansion of schooling. These new taxes raised US\$2 billion in new revenues to support the cost of buildings, teachers and educational materials. During 1997-2001, the Ministry of National Education constructed 103,983 new basic education classrooms, raising the total stock to 264,776 (Dulger, 2004). During 1996-2003, 103,000 additional primary school teachers were hired, creating a 36% increase (Dinçer, Kaushal, & Grossman, 2013). In order to accommodate the children living in rural areas far away from existing schools, transportation was arranged. The reform led to a substantial increase in the

number of students in primary school between the 1996/97 and the 2000/01 school years, by around 21% from 8.65 million to 10.48 million (educational statistics are available at <http://sgb.meb.gov.tr>).

The reform provides us with an ideal natural experiment, since it varied the number of years of schooling without significant curriculum changes. It created an external shock on the educational attainment of children since it suddenly and unexpectedly changed the duration of compulsory schooling. The law change was made rather abruptly, before much discussion in advance, and was immediately put into effect. Some analysts write that at the time the political climate was ripe for a change, therefore the politicians did not want to miss the opportunity (Dulger, 2004). For this study, it is in fact fortunate that the change was sudden and the households did not have the time to make plans against the change, since it makes it easier to defend using the reform as an instrument for educational attainment of the children.

Figure 2 shows dropout rates conditional on completing primary school by cohort and mother's view on gender roles using TDHS (2003) data. In this part of our analysis we use the 2003 data since it includes cohorts that have been affected by the education reform as well as cohorts that have not been affected by the education reform.⁶ Dotted-dashed line shows dropout rates of children whose mothers favor the education of the male child over the female child. Dotted-solid line shows dropout rates of children whose mothers have a non-traditional attitude on gender roles, and the line in the middle shows rates for the full sample. It can be seen from Figure 2 that dropout rates of the affected cohorts are lower by about 25 to 30 percentage points than dropout rates of the non-affected cohorts. It can also be observed that the compulsory schooling education reform narrowed considerably the gap in education between children whose mothers hold a traditional view and whose mothers hold a non-traditional one.

Figure 3 shows dropout rates conditional on completing primary school by cohort and gender. Red line (the highest line) represents female children, and blue line (the lowest line) represents male children. We observe that dropout rates are considerably lower for both male and female children for cohorts that were affected by the education reform, but unfortunately the gender gap in dropout rates remained persistent.

Figure 4 depicts dropout rates after primary school by gender and maternal attitudes on gender roles. This figure shows that dropout rates of male and female children of mothers with a

⁶ We only use TDHS 2003 and do not use the 2008 TDHS due to a potential selection problem. In 2008, the students who were not subject to the reform are 21 or older. Students who have mothers with a traditional view on gender roles are more likely to leave the household at an early age; therefore the pre-reform students that we would observe in the 2008 data are probably a selected sample.

traditional view on gender roles follow a similar pre- and post-reform trend (red dotted-dashed line vs. blue dotted-dashed line). Although the dropout rates fell substantially after the implementation of compulsory education reform, the gap in drop-out rates between female and male children of mothers with a traditional view remained persistent. Interestingly, the gap in drop-out rates between female and male children of mothers with a non-traditional view exhibits an increasing trend prior to the reform and appears to have narrowed in the post reform period. It is also worth noting that male children whose mothers hold a traditional view stay in school as long as male children whose mothers hold a non-traditional view in the post-reform cohorts.

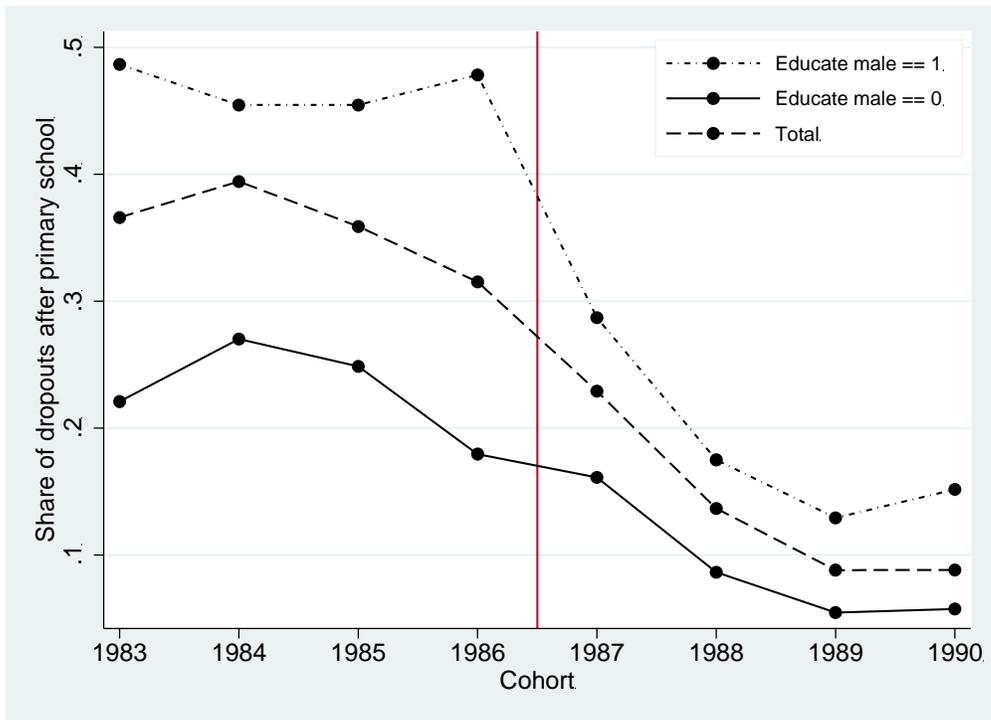


Figure 2: Dropout rate after primary school by cohort and mother's view on gender roles (TDHS 2003)

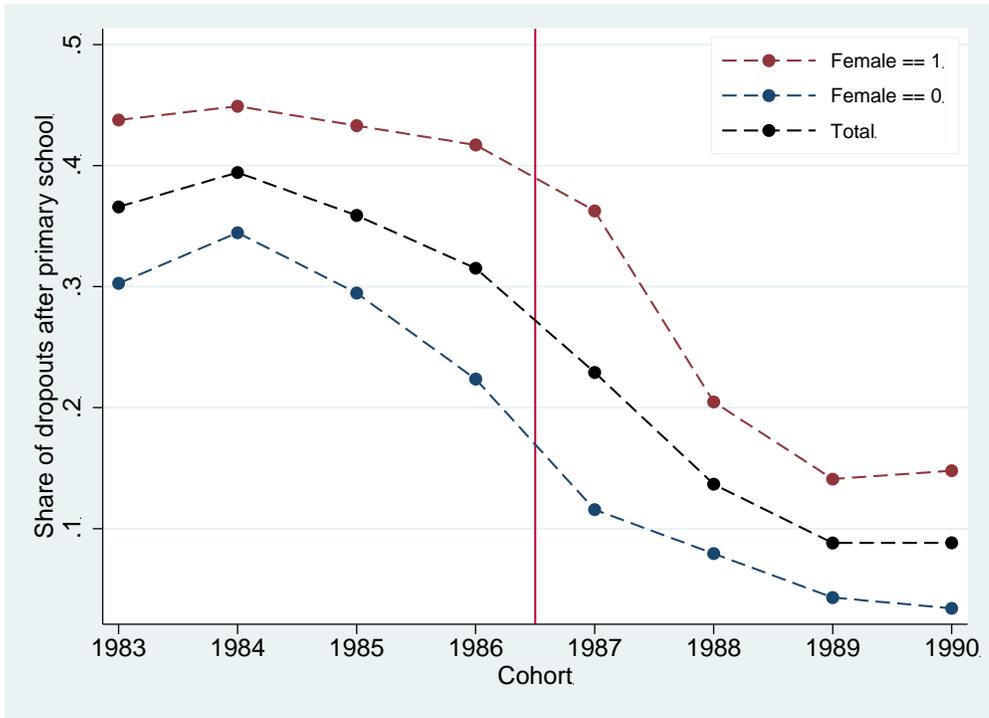


Figure 3: Dropout rate after primary school by cohort and gender (TDHS 2003)

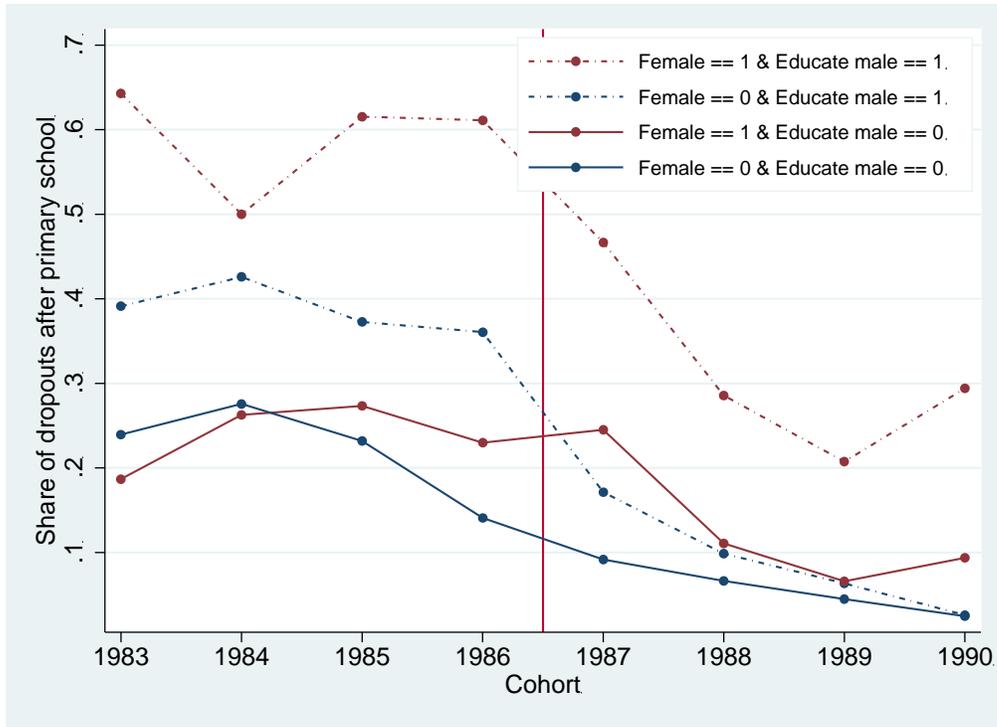


Figure 4: Dropout rate after primary school by cohort, gender and mother's view on gender roles (TDHS 2003)

The graphical analysis is both informative and intriguing. However, it has its limits since it presents education outcomes for cohorts without controlling for other possible factors that may affect these outcomes, such as parental education and income. In order to explore whether the extension of compulsory schooling reduced the gender gap in dropout rates after primary school in Turkey, we estimate the following equation using the TDHS 2003 dataset:

$$S_{ij} = \beta_0 + \beta_1 EduMale_{ij} + \beta_2 Female_{ij} + \beta_3 EduMale_{ij} * Female_{ij} + \beta_4 Post_{ij} + \beta_5 EduMale_{ij} * Post_{ij} + \beta_6 Female_{ij} * Post_{ij} + \beta_7 EduMale_{ij} * Female_{ij} * Post_{ij} + \beta_8 X_{ij} + \beta r_j + u_{ij}, \quad (2)$$

where S_{ij} is an indicator variable that takes value of 1 if child i residing in region j dropped out after completing primary school. $EduMale_{ij}$ is an indicator variable that takes value of 1 if mother of child i in region j agrees with the statement that “it is important for the male child to have education than the female child”, 0 otherwise. $Female_{ij}$ is an indicator variable that takes value of 1 if child i in region j is female, 0 otherwise. $Post_{ij}$ is an indicator variable that takes value of 1 if child i in region j is born in 1987 or later, 0 otherwise. The vector of controls, X_{ij} , includes number of siblings, birth order, age and age-squared of the mother, parental education, mother language of the father and mother, wealth quintile (poorest, poorer, middle, richer, richest) and type of residence (urban, rural) of the household. Moreover, r_j is the set of region dummies (West, South, Central, North, and East) that control for cross-regional differences. Standard errors are clustered at the mother level.

Table 3 presents the results. The sample that is used for regressions shown in columns 1 and 2 includes the cohorts of 1983 to 1990 (four cohorts that are affected by the reform and four cohorts that are not affected by the reform). Columns 1 and 2 show the results, respectively, without and with controls. Addition of a full set of controls affects results only marginally. Column 2 shows that the reform increased the probability to stay in school by 14.9 (33.5) percentage points for boys with mothers holding traditional (non-traditional) views.⁷ Since the interaction term of post with female and the triple interaction term “post*educate male*female”

⁷ For children of mothers with non-traditional views, educate male=0. If the child is male, female=0. Hence the coefficient on post (-14.9) implies that the reform increased the probability to stay in school by 14.9 percentage points for boys whose mother have non-traditional views. For mothers with traditional views, educate male=1 and the coefficient on post (-14.9) plus the coefficient on the interaction term of post with educate male results with 33.5=14.9+18.6 percentage points of increased probability to stay in school for boys with mothers holding traditional views.

are economically and statistically insignificant, we conclude that the reform did not have any differential effects for girls (with mothers with or without traditional views). Therefore, the gender gap is not eliminated by the reform.

In column 2 of Table 3, the interaction term between mother's traditional view and post-reform dummy is statistically significant with a point estimate of -0.186. This means that the reform decreased the adverse effects of mother's traditional view by 18.6 percentage points for both male and female children since the triple interaction term has a very small magnitude and is statistically insignificant. To summarize, although the reform helped to reduce school dropout rates, it failed to eliminate the gender gap against girls.

For a robustness check, we repeat the analyses with a restricted sample, a sample that includes only the cohorts of 1984 to 1989 (three pre-reform and three post-reform cohorts). Columns 3 and 4 show the results, respectively, without and with controls. Evidently, the findings are robust to sample change.

Table 3: Mother's Gender Views and Children's Dropout Likelihood in TDHS Rounds

Dependent variable: Dropout after primary school	(1)	(2)	(3)	(4)
<i>Mean</i>	[0.17]	[0.17]	[0.17]	[0.17]
Sample	Born 1983-1990		Born 1984-1989	
Educate male	0.183*** (4.53)	0.155*** (4.31)	0.195*** (4.31)	0.164*** (4.04)
Female	0.0285 (1.15)	0.0696** (3.13)	0.0502 (1.84)	0.0879*** (3.58)
Educate male * Female	0.169** (2.71)	0.116* (2.02)	0.138* (1.97)	0.0791 (1.22)
Post	-0.155*** (9.23)	-0.149*** (9.16)	-0.133*** (7.22)	-0.119*** (6.59)
Post * Educate male	-0.152*** (3.57)	-0.186*** (4.75)	-0.153** (3.13)	-0.181*** (3.99)
Post * Female	0.0378 (1.33)	0.0169 (0.66)	0.0174 (0.55)	-0.00511 (0.18)
Post * Educate male * Female	-0.00590 (0.08)	0.0235 (0.35)	0.00340 (0.04)	0.0295 (0.38)
Controls in Table 2		✓		✓
N	3839	3839	2889	2889
Adjusted R ²	0.100	0.229	0.089	0.218

Notes: OLS regressions. Control variables: number of siblings, region of residence, family wealth, mother's age, mother's age-squared/100, father's age, father's age-squared/100, mother's education, father's education, mother's mother tongue, father's mother tongue, a dummy variable indicating whether individual resides in urban areas. Absolute *t*-statistics are in parentheses and standard errors are clustered at the mother level. The only change caused by an inclusion of age and age-squared as controls is the reduction of the absolute value of "Post", which results from the high explanatory power of the 2nd order polynomial of age in explaining the trend before and after reform.

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

Conclusions

Turkey is one of the few developing countries where an educational gender gap to the detriment of females still exists. In this study, we establish that within the family and the society, having a traditional view on gender roles adversely affects the educational attainment of females at all education levels. We find that sons and daughters of women who think that educating sons is more important than educating daughters are more likely to drop out during and after primary school, and that the effects are stronger for daughters.

Using the 1997 education reform that increased compulsory schooling from 5 to 8 years as a natural experiment, we show that although the reform helped reduce school dropout rates across the country, reductions in school dropout rates were similar for sons and daughters of mothers with traditional views on gender roles, hence failing to eliminate the gender gap in education for this group.

The educational disadvantage of women has implications in many aspects of life. As mentioned in many studies, the gender gap in education against girls translates into lower female labor force participation and lower duration of employment in better paying jobs. It prompts girls to marry earlier and induces higher fertility. A gender gap in education against girls is associated with an educational gap between spouses and a lower bargaining power of women both at home and in the society. A gender gap in education against girls is also associated with lower investments in the education of future generations.

Since extending the duration of compulsory schooling has not eliminated the gender gap in education in the parts of the country where traditionalism prevails, there is definitely a need for education policies specifically targeting girls in such families or communities. Critiques of the education reform argue that the extension of compulsory schooling was not favored by all segments of the society, because it came too abruptly with no public consultation or debate before the approval of the law. Another criticism was that the reform was one-dimensional. Some religious parents, who preferred religious schools at the junior high level, were reluctant to send their children to secular schools for a longer period of time. Hence, it can be argued that future education policies should be made with a gradual approach and taking diverse preferences into account.

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