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ORIGINAL PAPER

Education, religion, and voter preference in a Muslim country

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Abstract Using a unique survey of adults in Turkey, we find that an increase in educational attainment, due to an exogenous secular education reform, decreased women's propensity to identify themselves as religious, lowered their tendency to wear a religious head cover (head scarf, turban, or burka) and increased the tendency for modernity. We also find that education has a negative impact on women's propensity to vote for Islamic parties. The effect of female education on religiosity is driven by those who reside in urban areas. There is no statistically significant impact of education on male religiosity and tendency to vote for Islamic parties. Increased education does not influence the propensity to cast a vote in national elections for either men or women.

Keywords Education · Religion · Women · Education reform · Secularism

JEL classification I2 · J0 · Z12

1 Introduction

Education can change individuals' behaviors by altering their time discounting (Becker and Mulligan 1997) and their preferences ranging from fertility to tolerance for violence (Cannonier and Mocan (2017), Lavy and Zablotsky 2011, Osili and Long 2008). A particularly important impact of education on individual beliefs and

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preferences involves religion. Philosophers and social scientists, ranging from Durkheim to Weber, have long argued that increased levels of education would diminish the need for religious adherence. Isolating the impact of education on religiosity, however, is complicated because unobserved determinants of educational attainment might be correlated with religiosity. Earlier studies often documented a positive relationship between education and religious activity (Iannaccone 1998). More recently, Glaeser and Sacerdote (2008), using the General Social Survey of the USA, reported that church attendance was positively related to education at the individual level but that the relationship between the two variables was negative at the aggregate level. Deaton (2011), on the other hand, found a negative relationship between individual education and religiosity using the Gallup World Poll data. Like most papers in this area, no causal interpretation is possible in these studies because the data sets do not contain any exogenous variations in schooling that can help identify the impact of education on religiosity.

In this paper, we employ a large and unique nationwide survey from Turkey that includes information about people's voting behavior and religious beliefs and practices in 2012 along with a host of individual attributes, including their education. We exploit the impact of a law enacted in 1997 that increased the mandatory years of secular schooling from 5 to 8 years. The law, which was passed very quickly and rather unexpectedly, generated an exogenous increase in education of cohorts of children who were younger than 11 years of age in 1997 but it had no impact on those who were older.

The data contain detailed information on individuals, some of which are not available in any other data sets, including the religious sect of the person (Sunni, Alevite Shiite, etc.), as well as ethnic identity (Turk, Kurd, Arab, and so on). We investigate the extent to which being exposed to three additional years of secular education due to the law has impacted religious beliefs and practices, such as whether individuals consider themselves an atheist, a "believer," a religious Muslim, or a devout Muslim; and whether women wear head cover (a headscarf, a religious "turban") or completely cover themselves with a burka—all strong indications of religiosity. We also analyze the impact of education on people's propensity to describe their lifestyle as modern, as opposed to traditional conservative or religious conservative.

Importantly, we have information about the *specific political party* the person voted for in the 2011 general election in Turkey as well as how he/she would vote if elections were held today. This allows us to investigate, for the first time in the literature, whether an increase in secular education alters the propensity to vote for an Islamic political party.[1]

The impact of education on religiosity has implications for the political economy of development because there is significant and growing influence of religion on politics in a number of countries around the world (Micklethwait and Wooldridge 2009). This has been especially the case for low-income, low-education Muslim countries in the Middle East and North Africa which are highly religious and have experienced a surge in Islam-inspired politics during the last decade.[2] If education has a causal impact on religiosity and the support for Islamic parties, an increase in the level of secular education could have an impact on the political landscape of these countries.

[1] See the appendix to Cesur and Mocan (2013) for a brief history of Islamic political movement in Turkey and the concept of Islamic political parties.

[2] See Table 10 for basic information on these countries.

Education is also expected to provide social externalities by improving individuals' propensity for civic participation. While empirical evidence generally indicates that education increases the propensity to vote (e.g., Dee 2004, Milligan et al. 2004), the research on voter turnout and civic participation has focused on developed countries (Degan and Merlo 2011, Siedler 2010). Because our data contain information about whether the respondent went to the ballot box and casted a vote during the last election and whether he/she intends to do so if an election were held today, we analyze whether an increase in education leads to a greater tendency to cast a vote.

A small number of studies in economics investigated the effect of education on religiosity, using different identification strategies. Exploiting variation in educational attainment stemming from Canadian compulsory schooling laws, Hungerman (2014) showed that an increase in the levels of completed schooling had a positive impact on the proportion of people with no religious affiliation in Canada. Becker et al. (2017) used data from 61 German cities observed over eight waves between 1890 and 1930. Controlling for city fixed effects, they found that an increase in advance-school enrollment rates in those cities was negatively related to the rate of Protestant church attendance. Mocan and Pogorelova (2014) employed micro data from 11 European countries and found that compulsory schooling reforms, enacted in the 1960s and 1970s, decreased various measures of religiosity and the tendency for being superstitious. Gulesci and Meyersson (2014) examined the effect of the education reform we analyze in this paper. Using a small sample of ever-married women from the Turkish Demographic Health Survey, they reported that in the case of ever-married women, the education reform lowered some indicators of religiosity such as studying the Qur'an, but the reform had no significant impact on more important indicators of religiosity such as praying five times a day and fasting during Ramadan.[3,4]

We use exposure to the 1997 compulsory schooling reform as an instrument for education and find that education has a significant impact on religiosity of women. Specifically, instrumental variable regressions show that having a middle school diploma mandated by the reform, as opposed to having an elementary school degree, reduces women's propensity to self-identify themselves as being religious by about 30 percentage points, and it increases the propensity to have a modern lifestyle by the same magnitude. Three additional years of education, associated with a middle school diploma, reduces the propensity to wear a head cover such as a head scarf, a religious turban, or a burka by about 40 percentage points. The same increase in secular education reduces women's propensity to cast a vote for an Islamic party by about 50 percentage points. Education does not have a statistically significant impact on religiosity or voting behavior of Muslim men.

Using a supplementary survey from the year 2008, we perform additional analyses which demonstrate that the impact of education identified in the paper is not due to a cohort effect. We also estimate a difference-in-differences specification, the results of which support the findings of the paper.

[3] Praying five times a day and fasting during the month of Ramadan are two of the five requirements of Islam, by which each religious Muslim must abide.

[4] While the outcomes studied by Gulesci and Meyersson (2014) differ from the ones analyzed in our study, these two studies are, for the most part, complementary to each other.

To investigate if the effect of schooling differs by the location of residence, we estimate our specifications for women who live in urban and rural areas separately. These results reveal stark differences between the effects of education in urban versus rural locations. We find that the impact of schooling on women's religiosity is mainly driven by females who reside in urban areas. This finding is in line with the argument that the additional 3 years of mandated schooling enabled female students to have exposure to a larger and more diverse network of friends and ideas in urban settings, which induces them to alter their preferences towards a less religious life style. The same type of an exposure is much less likely to take place in rural areas where the social and cultural environment is more uniformly conservative.

Section 2 describes the education reform that has increased the mandatory years of schooling in Turkey. Section 3 introduces the data and the variables. Section 4 presents empirical methodology and the results. Section 5 includes the robustness analyses and Section 6 is the conclusion.

2 The 1997 education reform

On August 18, 1997, the secular Turkish government increased compulsory schooling from 5 to 8 years (law no.: 4306). The new law went into effect immediately in the beginning of the 1998–1999 education year, in the Fall of 1998. Students who had completed the fourth grade or lower at the end of the 1996–1997 education year in Spring 1997 had to comply with the new law (Kirdar et al. 2014), while students who had finished the fifth grade in the spring of 1997 were exempt from it.

The relevant Turkish law states that a child may start the first grade in the Fall if he/she is 72 months old at the end of that calendar year.[5] This means that those who are born at the end of 1986 (in October–December) can start school in 1992. It is also known that the age cutoff is not strictly enforced and that children are allowed to start school if they are on the margin of the 72-month cutoff. Thus, those who are born in early 1986 would start the first grade in Fall 1991, rather than Fall 1992. This means that although most of the children of the 1986 cohort would have enrolled in the first grade in 1992 and therefore have completed the fifth grade in Summer 1997 and thus were exempt from the mandate of the education reform, some children who were born in 1986 have completed only the fourth grade and these children were impacted by the reform. Therefore, in benchmark models we exclude those born in 1986, although as we show later, including them does not alter the results.

During the time period when the law was enacted, Turkey was involved in heavy negotiations for the European Union membership and the government was concerned that European Union negotiations would not proceed without the implementation of a reform that increased the level of education in Turkey (Dulger 2004). The law was also an attempt to limit the extent of religious education.[6]

Prior to the education reform, mandatory education was limited to 5 years and after completing 5 years of primary schooling, students had three options: (i) discontinue

[5] Resmi Gazete; Friday, August 7, 1992, Section 14.

[6] See the Appendix to Cesur and Mocan (2013) for the details on this point and the political landscape in Turkey in 1997.

their education, (ii) go on to secondary schooling (for an additional 3 years) at traditional middle schools; and (iii) go on to secondary schooling at vocational schools, including the religious schools which are in part designed to educate religious clerics to be employed by religious enterprises including the mosques.[7,8] The education reform of 1997 did not involve any changes in curriculum; that is, neither the course contents nor the composition of courses are effected by the reform (Dulger 2004). But, the reform combined the primary and middle schools. Therefore, stand-alone middle schools, including vocational middle schools, were closed. Vocational high schools, including religious ones, could only admit students after the students have completed their 8-year of mandatory schooling.

Compulsory education is free in Turkey (with the exception of books, supplies, school uniforms, and commuting costs) and non-compliance is subject to monetary fines,[9] although they are not strictly enforced.[10] Therefore, while the middle school graduation rates increased above 90% after the reform, perfect compliance was not achieved.

The education reform in Turkey is substantially different from those implemented in other developing countries. Most education reforms in developing nations involve either a reduction in out-of-pocket expenditures on education for families, or a combination of expenditure reduction, increased access to education, and an increase in mandatory years of schooling (Dursun et al. 2017). The Turkish reform, on the other hand, involves only an increase in mandatory years of education that is targeted at the student population with low propensity for schooling beyond the amount mandated by law. Therefore, the associated local average treatment effect represents the impact of extra years of schooling among the subsample of individuals who are forced to receive at least 8 years of schooling as opposed to 5 years of basic education (Dursun et al. 2017).

Exploiting this compulsory schooling reform in Turkey as the source of exogenous variation in educational attainment, a number of studies estimated the causal effect of extended primary schooling on different outcomes, including health behaviors (Cesur et al. 2014), earnings (Mocan 2013), subjective well-being (Dursun and Cesur 2016), domestic violence (Erten and Keskin 2017), gender gap in educational attainment (Kirdar et al. 2014), fertility, marital status, maternal behaviors, and child health (Dinçer et al. 2014; Güneş 2015, 2016; Dursun et al. 2017).

3 Data

We use a unique data set, drawn from the *KONDA Barometer*, collected by the KONDA Research and Consultancy, which is a prominent research and consulting firm in Istanbul, Turkey. The KONDA Barometer surveys were conducted nationwide 11 times a year—during the last weekend of each month except for the month of Ramadan (the month of fasting for Muslims, the timing of which is determined by lunar

[7] Girls can also attend these religious vocational schools, although they are not allowed to be clerics upon graduation by the rules of Islam.
[8] http://www.studyinturkey.com/content/sub/education_system.aspx.
[9] http://mevzuat.meb.gov.tr/html/24.html.
[10] http://spm.ku.edu.tr/wp-content/uploads/pdf/okulterk.pdf.

calendar). This is a nationally representative survey, conducted by face-to-face interviews. Standard election poll questions as well as lifestyle questions, including religious beliefs and attitudes are asked on each survey.[11] Because of their aim to accurately predict the election results and to provide information on public opinion on a number of timely social and political issues, the KONDA Barometer surveys are specifically designed to produce a nationally representative sample. The data we use in the empirical analyses consist of about 9600 voting-age young adults surveyed in 2012.[12]

Our analysis sample is comprised of those born between 1980 and 1994; that is, they were between the ages of 18 and 32 in 2012.[13] Turkey is a country where 98% of the population is Muslim. This is also reflected in our data, where 1.6% of the respondents indicated that they were non-Muslims. We excluded these individuals to focus on Muslims.

Table 1 displays the descriptive statistics of both the independent variables (personal attributes of individuals) and the outcomes. Those who were 12 years of age or older in 1997 would have completed 5 years of elementary schooling and therefore they were exempt from the mandate of the law. These individuals, who were born in 1985 or earlier, are not "treated" by the law; thus, they constitute the "control" group. Those who were 10 years old or younger in 1997 were forced to acquire 8 years of schooling. This group consists of those who were born in 1987 or later and they constitute the "treatment group." Those who were born in 1986 (11 years old in 1997) may or may not have been treated by the law, depending on their school starting year. Thus, in empirical analyses, we exclude this group. Running the models by including this cohort and assigning them a value of one half or one third for the value of treatment did not change the results.

As shown in Table 1, the proportion of individuals who have at least a middle school degree (8 years of schooling) is higher among those who are in the treatment group in comparison to those who are in the control group. The difference is striking for females. About 54% of females who were born before 1986 have a middle school education or more. On the other hand, the rate is 83% among those who are exposed to the education reform (born after 1986). Figure 1 displays this information by birth cohort. To present the long-run trend in middle school completion, the figure displays the proportion of females with at least a middle school education, going back to those born in 1960, although the main empirical analyses will use cohorts born between 1980 and 1994. As discussed in the previous section, those who were born in 1986 constitute the first cohort that is exposed to the policy although it cannot be determined with certainty whether the entire 1986 birth cohort was treated by the reform. The vertical line in

[11] In addition, each month's survey is organized around a unique socio-political theme. Detailed information on 2012 KONDA Barometer themes can be found at the following link: http://www.konda.com.tr/en/raporlar/KONDA_Barometer_2012_Brochure.pdf.

[12] The monthly surveys, upon which the data are based, are not conducted on behalf of a particular political party or organization, nor are they sold to such organizations. Instead, these data are used to conduct independent political analyses as well as to predict political trends and election outcomes. KONDA has outstanding record of predicting the outcomes of recent Turkish elections using these same data, which minimizes any concerns about the reliability of the information provided by the respondents. In fact, the accuracy of their election predictions attracted media coverage both in Turkey (e.g., Milliyet 2007, Sabah 2011) and internationally (e.g., The Economist 2007, 2008; Reuters 2011).

[13] Variations in this window did not alter the point estimates, although small intervals reduced the sample size and the precision of the estimated coefficients. We elaborate on this in the robustness section.

Table 1 Descriptive statistics by exposure to the 1997 education reform

Variable	Variable definitions	All	Women		Men	
			treatment	control	treatment	control
Middle school diploma	= 1 if holds at least a middle school degree, = 0 otherwise	0.775 (0.418)	0.826 (0.379)	0.536 (0.499)	0.925 (0.264)	0.772 (0.419)
Religious	= 1 if religious or devout, = 0 if believer or atheist	0.596 (0.491)	0.588 (0.492)	0.695 (0.461)	0.516 (0.500)	0.603 (0.489)
Atheist	= 1 if atheist, = 0 if believer, religious, or devout	0.014 (0.119)	0.013 (0.114)	0.009 (0.096)	0.020 (0.140)	0.014 (0.117)
Modern	= 1 if modern, = 0 if conventional or religious conservative	0.350 (0.477)	0.411 (0.492)	0.283 (0.451)	0.414 (0.493)	0.269 (0.443)
Wears head cover	= 1 if wears headscarf/burka/ turban, = 0 otherwise	0.489 (0.500)	0.394 (0.489)	0.589 (0.492)	– –	– –
Voted Islamic in 2011	=1 if voted for an Islamic political party in 2011 general elections, = 0 otherwise	0.566 (0.496)	0.550 (0.498)	0.649 (0.477)	0.503 (0.500)	0.548 (0.498)
Islamic voter now	= 1 if would vote for an Islamic political party if general elections were held this Sunday (2012), = 0 otherwise	0.560 (0.496)	0.561 (0.496)	0.666 (0.472)	0.493 (0.500)	0.537 (0.499)
Voter 2011	= 1 if voted in the general elections in 2011, = 0 otherwise	0.899 (0.301)	0.875 (0.331)	0.945 (0.228)	0.836 (0.371)	0.941 (0.235)
Voter now	= 1 if would vote if general elections were held this Sunday, = 0 otherwise	0.918 (0.274)	0.913 (0.282)	0.934 (0.248)	0.906 (0.292)	0.925 (0.264)
Age	Age in years	25.051 (4.458)	21.606 (2.392)	29.342 (1.765)	21.381 (2.442)	29.331 (1.742)
Sunni	= 1 if Muslim Sunni, = 0 otherwise	0.927 (0.260)	0.923 (0.267)	0.926 (0.263)	0.931 (0.254)	0.928 (0.258)
Alevite Shiite	= 1 if Muslim Alevi, = 0 otherwise	0.053 (0.224)	0.055 (0.229)	0.055 (0.228)	0.048 (0.214)	0.055 (0.227)
Kurdish or Zaza Ethnicity	= 1 if Kurdish or Zaza, = 0 otherwise	0.143 (0.350)	0.153 (0.361)	0.135 (0.342)	0.141 (0.348)	0.141 (0.348)
Arabic or other ethnicity	= 1 if ethnicity is not either Turkish or Kurdish, = 0 otherwise	0.042 (0.202)	0.045 (0.208)	0.042 (0.199)	0.042 (0.201)	0.040 (0.197)
Urban	= 1 if lives in an urban area, = 0 otherwise	0.798 (0.401)	0.811 (0.391)	0.816 (0.388)	0.787 (0.409)	0.779 (0.415)
No. of Observations		9625	2444	2267	2809	2105

The data pertain to 2012. Treatment group consists of those born in 1987–1994. The control group consists of those who were born in 1980–1985. Exposure to the law status is unclear for the 1986 birth cohort

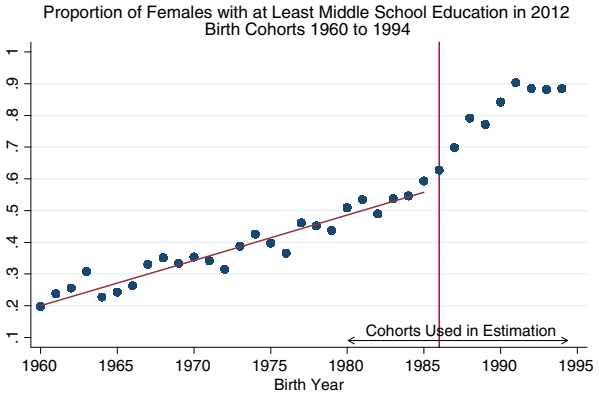


Fig. 1 Proportion of females with at least middle school education in 2012 birth cohorts 1960 to 1994

Fig. 1 identifies this cohort. The full impact of the policy should be felt starting with the cohort of 1987. The female middle school completion rate jumps with the 1987 cohort, and stays above its long-run trend. Specifically, the proportion of females with at least a middle school education is 51% among those who were born in 1980. The rate rises gradually and reaches 58% in the cohort of 1985. It goes up to 62% among those who were born in 1986 and jumps to 71% in the 1987 cohort and keeps rising. About 92% of those who were born in 1995 have at least a middle school diploma.[14]

Consider the case of a student who was born in 1985 and therefore just missed the mandate of the law when it was implemented in 1998. Assume that the parents of this student were not planning to send their children to the middle school prior to the passage of the law. It could, however, be the case that upon the passage of the law, the parents might recognize that their child, who just completed 5 years of schooling, could be in a disadvantaged position if he/she is not enrolled in middle school. This is because of the realization that the friends and peers of their child, who are only one or 2 years younger, will acquire 8 years of schooling and this may create a handicap for their child in the labor market. If this were the case, children who just missed the mandate of the law (those who had completed the fifth grade right before the law was passed) would enroll in middle school despite the fact that the law was not binding for them.

Table 1 also shows that a similar increase in education is evident in the male sample. Males were more educated than females before the reform, but the proportion of males with at least a middle school degree went up after the reform as well. Seventy-seven percent of males who were not exposed to the reform have at least a middle school degree, while the rate is about 93% among those who were treated by the reform. Figure 2 shows the proportion of males with a middle school diploma or higher by birth cohort, starting with those who are born in 1960. The last cohort of men that missed the reform (those born in 1985) and the first cohort that is fully exposed to it (those born in 1987) have about a 9-percentage-point difference in the rate of having at least a middle

[14] We compared this information to the 2012 Turkish Household Labor Force Survey that is obtained from Turkish Statistical Institute. This institute is a government agency, responsible for collecting data on a variety of indicators, ranging from labor markets to financial markets. The Turkish Household Labor Force Survey is similar in its design to the Current Population Survey in the USA. Using about 80,000 females in the relevant age range, we plotted the proportion with at least a middle school degree in Appendix Fig. 18, which exhibits a pattern similar to Figure 1.

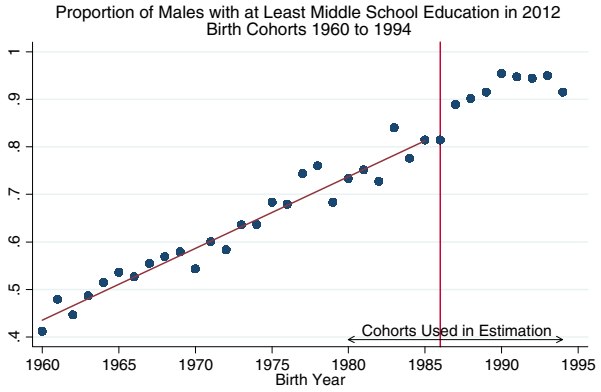


Fig. 2 Proportion of males with at least middle school education in 2012 birth cohorts 1960 to 1994

school diploma. A comparison of Figs. 1 and 2 shows that the proportion of females with at least middle school degree was 20 percentage points lower than that of males in all cohorts from 1960 to 1985, and that the education reform closed the gap significantly: among the cohorts born after the 1990s, the gap is only about five percentage points.

Measures of Religiosity People were asked about how religious they were. The following are the possible answers to this question: *unbeliever*, *believer*, *religious*, or *devout*.[15] The variable religious, which captures the degree of self-reported piousness at the intensive margin, takes the value of 1 if the respondent indicated that he/she was religious or devout Muslim and it is zero for those who are unbeliever or a believer. We also created a variable, *Atheist*, which takes the value of 1 if the person declared themselves an "unbeliever" and zero if they indicated that they were a believer, a religious person, or devout. Less than 2% of the sample declared that they were atheists, but despite the small size of this group, there is a statistically significant difference between those who were and were not exposed to the education reform, both for males and for females.

Table 1 shows that about 59% of females in the treated group consider themselves as religious, while the rate is about 70% in the control group. Similarly, 52% of males of the treated group are religious while 60% of males in the control group identified themselves as religious. The fact that females in both the treatment and the control groups are more religious in comparison to their corresponding male counterparts is consistent with previous research that has repeatedly shown that women are more religious than men. It has been argued that women are raised to be submissive, which makes it easier for them to accept religion (Suziedelis and Potvin 1981). Similarly, it has been hypothesized that the traditional role of women involves teaching morality and spirituality to their children and this role makes it easier to be religious (Walter and Davie 1998). Miller and Stark (2002) argue that women are more risk averse than men and to the extent that being non-religious constitutes risk-taking behavior, the difference in risk aversion between men and women can explain the difference in religiosity.

[15] The exact wording of these alternatives as posed to the individuals are: inancsiz, inancli, dindar, sofu.

A strong indication of religiosity among Muslim women is their propensity to wear a headscarf, a turban, or a burka. It is not common among Turkish Muslim women to wear a burka: the rate of burka-wearing women in the sample is about 1%. A turban is a symbol of political Islam in Turkey, and it has been in the center of a political debate about secularism, freedom of expression, and political Islam since the 1980s.[16] It is a piece of fabric, larger than a headscarf, which covers up all of the hair and is tightly wrapped around the neck.[17] It also involves a narrow piece of fabric on the forehead to make sure that no hair is shown above the forehead. Ten percent of women in the sample (ages 18 to 32) have reported wearing a turban. A headscarf, on the other hand, is by far the most common head gear worn by Muslim women in Turkey. Thirty-eight percent of women in our sample wear a head scarf. Thus, about 49% of the women in the sample have reported wearing a head scarf, a turban, or a burka. The rate is 59% among those in the control group and it is 39% among those who were exposed to the education reform.[18]

The propensity to wear a head cover might go up after girls transition to being young adults and perhaps after they get married if their husbands put pressure to wear a head scarf. Figure 3 presents the proportion of women wearing a head cover. About 75% of women born in the early 1960s (who are around 50 years of age in 2012) wear a head cover and the rate is declining as cohorts get younger, but the break in the trend in the birth year of 1986 (26 years olds) is striking. Starting with the 1987 cohort, which is the first cohort fully exposed to the law, the propensity to wear a head cover declines dramatically from 52% in the 1987 cohort to 33% in the 1991 cohort (those who are 21 years old in 2012), and to 27% in the 1994 cohort (those who are 18 years old in 2012).

The respondents of the survey were also asked about their lifestyles. The choices given were "modern," "traditional conservative" and "religious conservative." The dichotomous variable *modern* indicates whether the person stated that his/her lifestyle was modern. The question posed to the respondents does not specify what is meant by modern lifestyle. Although interpretations may differ, in the context of the question and the alternatives presented to the respondents, it is clear that modernity is understood as a lifestyle choice including dimensions from what type of clothes to wear to relationship with the opposite sex and social interactions. Table 1 shows that the rate of self-declared modernity is higher in the treatment group for both males and females. Figures 4 and 5 display the rate of modernity by birth year for women and men, respectively. In both cases, there is a clear break in the trend of self-declared modern life style starting with the first cohort that was exposed to the education reform.

The tendency to cast a vote, and the propensity for vote for an Islamic party The survey included a question which asked the respondents, "If elections were held today, which party would you vote for?" A comprehensive list of political parties is provided to the respondents to choose from, as well as the options of voting for independent candidates, not going to the ballot box, and casting a blank vote. *Voter Now* is a dummy

[16] The details of the turban issue are summarized in the Appendix to Cesur and Mocan 2013.

[17] A "turban" does *not* refer to the type of head gear worn by Sikhs. A picture of a woman wearing a turban is provided at the end of the Appendix.

[18] A TESEV report (Çarkoğlu and Toprak, p. 24) found that in 2006 about 49% of women wore a headscarf, 11% wore a turban, and 1% wore a burka. These rates are very similar to the rates found in our data.

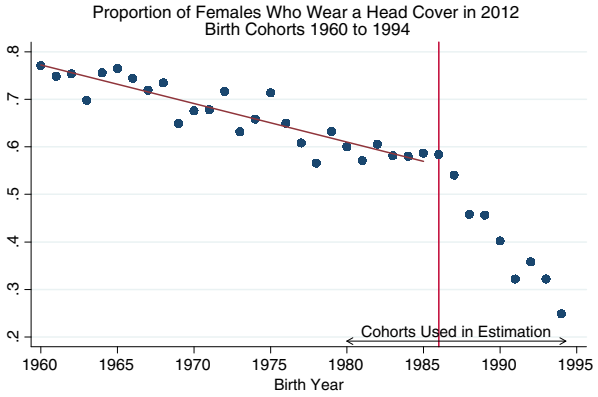


Fig. 3 Proportion of females who wear a head cover in 2012 birth cohorts 1960 to 1994

variable that takes the value of 1 if the person has identified a political party for which he/she would vote for if elections were held today. The variable takes the value of zero if the individual indicated that she would not cast a vote.[19] Those who indicated that they have not yet made up their minds as to how to vote are excluded. Similarly, the survey asked the respondents which political party they voted for in the general elections on June 12, 2011. The variable *Voter 2011* takes the value of 1 if the person declared he/she has voted for a political party or for an independent candidate. Voter 2011 is zero if the respondent indicated that he/she did not go to the ballot. Using an alternative version of this variable by including people who indicated that they went to the ballot box but casted a blank vote, did not change the results.

Using the same survey question we created a binary variable, *Islamic Voter Now*. This variable takes the value of 1 if the person indicated that he/she would vote for Justice and Development Party (AKP), Felicity Party (SP), or People's Voice Party (HAS) if elections were held today.[20] These are Islamic political parties, and the AKP has been the governing party in Turkey since November 2002.[21] The variable takes the value of zero if the person indicated that she would vote for any political party, other than the Islamic parties listed above.[22]

Figures 6 and 7 present the proportion of women and men, respectively, who would vote for an Islamic party if elections were held today by birth cohort. (Again, in empirical analyses we use cohorts 1980 to 1994). As shown in Table 1, 66% of women born between 1980 and 1985 would vote for an Islamic party now. These cohorts missed the education reform. The cohorts of 1987–1994 were treated by the education mandate and the proportion of women who would vote for an Islamic party is 56% in the group. As shown in Fig. 6, this drop is in sharp contrast to the support received by Islamic parties from all cohorts born between 1960 and 1985. Figure 7 presents the

[19] Turkey, founded in 1923, gave suffrage to women in local elections in 1930. Women gained full suffrage (any type of election) in 1934, and 18 women were elected to the parliament in the general elections of 1935.
[20] People's Voice Party (HAS) merged with the Justice and Progress Party (AKP) in September 2012.
[21] The details of the Islamic Party movement in Turkey are provided in the Appendix.
[22] Political scientists use the term "Islamic Party" to describe a political party that stems from Islamic roots (Fuller 2004; Roy 1994) and as Cesur and Mocan (2013) described in the Appendix, this is the case for the parties listed here. In particular, although the Justice and Development Party (AKP) is trying to appeal to a wider voter base, it is clearly an Islamic party (Taşpınar 2012, Roy 2012).

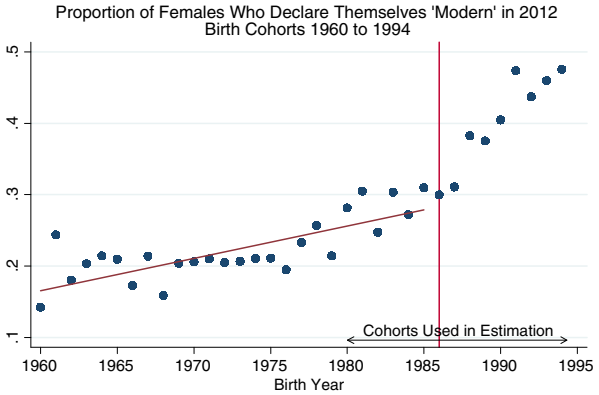


Fig. 4 Proportion of females who declare themselves "Modern" in 2012 birth cohorts 1960 to 1994

same information for men. The difference in the proportion of men who would vote for an Islamic party today is only 5% age points between the cohorts of 1980–1985 and 1987–94.

As we explain in Section 4, we also obtained the graphs shown in Figs. 1, 2, 3, 4, 5, 6, and 7 after netting out the impact of exogenous variables. These graphs, displayed in Figs. 9, 10, 11, 12, 13, 14, and 15 in the Appendix, exhibit a jump in the level of outcome variables between the treatment and control groups.

We also used the question about how the respondents voted in 2011 and created a dichotomous variable *Voted Islamic in 2011* if the person voted for an Islamic party in the 2011 general elections. Table 1 shows that there are differences between the treatment and control groups in this variable as well, and the graphs were similar to Figs. 6 and 7.

As Table 1 shows, 93% of the sample adheres to the Sunni sect of Islam, and 5% is Alevite Shiite Muslims. The variable *Kurt/Zaza* takes the value of 1 if the person identified himself/herself as being of Kurdish or Zaza ethnic origin. Other ethnicity takes the value of 1 if the person is Arabic or of other ethnic origin. The omitted category is being ethnically Turkish. The bottom panel of Table 1 displays the dichotomous covariate *Urban* which indicates whether the survey participant lives in

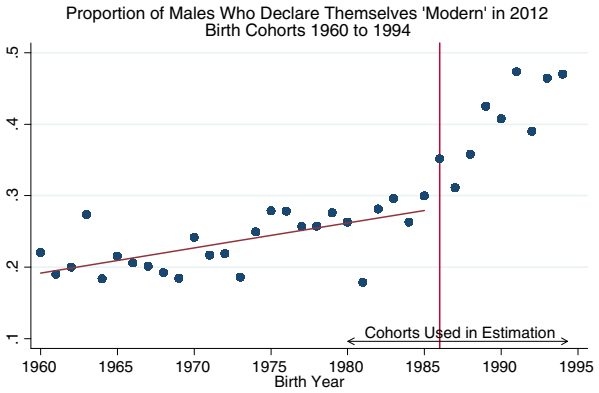


Fig. 5 Proportion of males who declare themselves "Modern" in 2012 birth cohorts 1960 to 1994

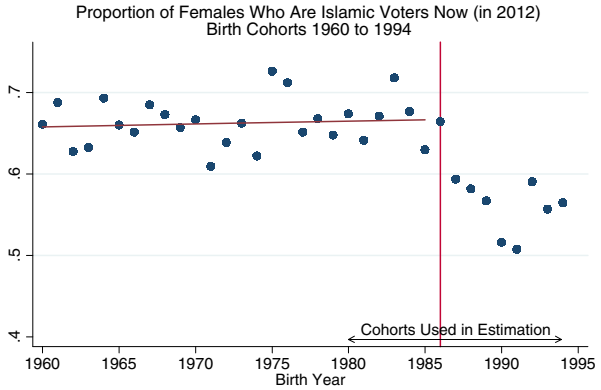


Fig. 6 Proportion of females who are Islamic voters now (in 2012) birth cohorts 1960 to 1994

an urban area as opposed to a rural locality. In our sample, roughly 80% of the survey participants live in urban areas.

4 Empirical specification and the basic results

Consider Eq. (1) below, where R_i represents a particular outcome for the ith person, such as whether the person wears a head cover or whether s/he has voted for an Islamic party:

$$R_i = \beta_0 + \beta_1 \mathrm{Educ}_i + X_i\Omega + \varepsilon_i, \tag{1}$$

Educ is an indicator to show whether the person has at least a middle school education (8 years of schooling). The vector X stands for personal characteristics of the individual, including age, ethnicity, the religious sect, and the location of residence. Vector X also contains survey region fixed effects and month dummies to control for the month and location in which the survey was registered. It also includes fixed effects for the region-of-birth of the respondent. In alternative specifications, we estimated the

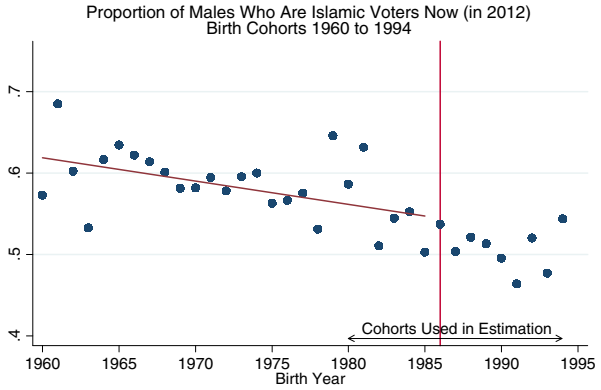


Fig. 7 Proportion of males who are Islamic voters now (in 2012) birth cohorts 1960 to 1994

models allowing for differential age trends in the treatment and control groups and obtained very similar results both in terms of the estimated coefficients and the standard errors.

Because unobserved determinants of religiosity and other outcomes of interest, captured by the error term ε, are likely to be correlated with education, we use exposure to the 1997 law as an instrument for education. Thus, the first-stage regression takes the following form:

$$\text{Educ}_i = \gamma_0 + \gamma_1 \text{Law}_i + X_i \Psi + \mu_{i,} \quad (2)$$

where Law is a dummy variable that indicates whether the individual was treated by the reform. It takes the value of 1 if the person was born in 1987 or later, and it is zero if the person was born before 1986. In all regressions, the estimated standard errors of the coefficients are clustered by region of birth—age group. Alternatively, we cluster the standard errors by treatment status—region. This specification provides only 24 clusters as there are 12 regions; therefore, the standard errors obtained from this clustering should be interpreted with caution; the standard errors obtained from these two clustering methods are similar. In an alternative specification, we included those who were born in 1986 and assigned them the value of 0.33 or 0.50 as alternative values of the treatment. The results were very similar to our main estimates.

OLS estimates of religiosity, electoral participation, and Islamic voting In Tables 2 and 3, we present the OLS estimates of the associations between outcome variables and educational attainment in the female and male samples, respectively. While these specifications naively assume that education is exogenous, they may still provide useful information for the purpose of comparison with the instrumental variables regressions that are reported later. Column (1) of Table 2 shows that among females, having at least a middle school diploma, as opposed to elementary school education, is associated with a decrease in the propensity of being religious by 19.7 percentage points. Similarly, columns (2) and (3) of Table 2 demonstrate that an increase in female education is correlated with an increased probability that a woman declares herself as atheist, and identifies her lifestyle as modern instead of conservative or religious.[23] In column (4), we find that women who earned at least a middle school degree are 34.4 percentage points less likely to wear a head cover, such as such as a headscarf, turban, or burka.

The results in columns (5) and (6) show that female schooling is not related to the likelihood of voting in the previous election (in 2011), and that women who hold at least a middle school diploma are 2.8 percentage points less likely to vote if the elections were held this Sunday.[24] Albeit small in magnitude, this result is in contrast to studies that reported a positive relationship between education and civic participation in developed countries.

[23] In the regression of atheism in Table 2, only 53 people (1.12% of the sample) are atheists. These individuals, however, reported a religious sect such as Sunni or Alevite Shii'te, suggesting that for them this is cultural, rather than religious identity.

[24] In Turkey, voting is compulsory and there is a monetary penalty associated with non-voting. Although the 22.5 Turkish Lira penalty (about US$13) for not voting is not substantial, and enforcement is spotty, compulsory voting which has been in effect since 1986 is likely the reason for high rates of voter turnout which is usually greater than 85%.

Table 2 Estimates of religiosity, the propensity to cast a vote, and the propensity to vote for an Islamic party on middle school diploma, female sample—OLS regressions

	(1) Religious	(2) Atheist	(3) Modern	(4) Wears head cover	(5) Voter 2011	(6) Voter now	(7) Voted Islamic In 2011	(8) Islamic voter now	(9) Never vote Islamic
Middle school diploma	−0.197***	0.011***	0.233***	−0.344***	−0.013	−0.028***	−0.221***	−0.227***	0.219***
	(0.016)	(0.003)	(0.016)	(0.016)	(0.012)	(0.010)	(0.015)	(0.016)	(0.015)
Age	0.016	0.005	−0.052***	0.105***	0.085***	0.040***	0.003	−0.016	0.002
	(0.017)	(0.004)	(0.015)	(0.018)	(0.016)	(0.013)	(0.025)	(0.018)	(0.026)
Age squared	−0.000	−0.000	0.001***	−0.002***	−0.001***	−0.001***	−0.000	0.000	−0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Sunni	0.025	−0.036*	−0.096*	0.147***	−0.012	0.001	0.126*	0.096*	−0.090
	(0.044)	(0.021)	(0.051)	(0.046)	(0.031)	(0.030)	(0.065)	(0.056)	(0.064)
Alevite Shiite	−0.354***	0.041*	0.239***	−0.226***	−0.024	−0.032	−0.376***	−0.466***	0.493***
	(0.055)	(0.023)	(0.062)	(0.055)	(0.039)	(0.036)	(0.070)	(0.069)	(0.077)
Kurdish or Zaza ethnicity	0.048*	0.017**	−0.054**	0.084***	−0.010	−0.018	−0.188***	−0.156***	0.183***
	(0.026)	(0.008)	(0.021)	(0.020)	(0.015)	(0.012)	(0.043)	(0.046)	(0.047)
Arabic or other ethnicity	0.049	0.036**	−0.017	0.029	−0.018	0.034	0.065	0.077**	−0.095**
	(0.037)	(0.014)	(0.036)	(0.035)	(0.022)	(0.026)	(0.039)	(0.037)	(0.040)
Observations	4694	4694	4641	4659	4135	3782	3527	3489	2958

The entries in parentheses are standard errors of the estimated coefficients, clustered by birth province-age level. Twelve regions and five age groups yield 60 clusters. Exposure to the Law = 1 if the person was born between 1987 and 1994, it is zero if the year of birth is between 1980 and 1985. The 1986 cohort is excluded as whether those born in 1986 were bound by the reform is uncertain. If Kurdish or Zaza Ethnicity = 0 and Arabic and Other Ethnicity = 0, the individual is a Turk. Regressions include region fixed effects and monthly dummies for the survey month, as well as dummies for region of birth

*Statistical level at the 10% level; **Significance at the 5% level; ***Significance at the 1% level or better

Table 3 Estimates of religiosity, the propensity to cast a vote, and the propensity to vote for an Islamic party on middle school diploma, male sample—OLS regressions

	(1) Religious	(2) Atheist	(3) Modern	(4) Voter 2011	(5) Voter now	(6) Voted Islamic in 2011	(7) Islamic voter now	(8) Never vote Islamic
Middle school diploma	−0.093***	0.010*	0.132***	−0.024**	−0.017	−0.110***	−0.113***	0.091***
	(0.021)	(0.005)	(0.018)	(0.011)	(0.011)	(0.022)	(0.022)	(0.024)
Age	−0.048**	−0.000	−0.032*	0.065***	0.014	−0.023	−0.064***	0.030
	(0.021)	(0.004)	(0.017)	(0.016)	(0.013)	(0.023)	(0.020)	(0.026)
Age squared	0.001***	−0.000	0.000	−0.001***	−0.000	0.001	0.001***	−0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Sunni	−0.023	−0.026	−0.210***	0.055	0.066	0.203***	0.105	−0.204**
	(0.044)	(0.020)	(0.037)	(0.046)	(0.040)	(0.066)	(0.066)	(0.091)
Alevite Shiite	−0.378***	0.044*	0.126**	0.098**	0.059	−0.305***	−0.359***	0.323***
	(0.060)	(0.022)	(0.054)	(0.049)	(0.046)	(0.075)	(0.068)	(0.096)
Kurdish or Zaza ethnicity	0.038	0.012	−0.047**	−0.007	−0.022	−0.197***	−0.194***	0.190***
	(0.024)	(0.007)	(0.018)	(0.018)	(0.015)	(0.051)	(0.036)	(0.050)
Arabic or other ethnicity	0.111**	0.007	−0.044	−0.005	−0.071***	0.070	0.056	−0.074
	(0.044)	(0.014)	(0.046)	(0.029)	(0.023)	(0.047)	(0.044)	(0.046)
Observations	4896	4896	4826	4195	4086	3396	3725	2876

The entries in parentheses are standard errors of the estimated coefficients, clustered by birth province-age level. Twelve regions and five age groups yield 60 clusters. Exposure to the Law = 1 if the person was born between 1987 and 1994, it is zero if the year of birth is between 1980 and 1985. The 1986 cohort is excluded as whether those born in 1986 were bound by the reform is uncertain. If Kurdish or Zaza Ethnicity = 0 and Arabic and Other Ethnicity = 0, the individual is a Turk. Regressions include region fixed effects and monthly dummies for the survey month, as well as dummies for region of birth

*Statistical level at the 10% level; **Significance at the 5% level; ***Significance at the 1% level or better

Column (7) in Table 2 presents the results where the dependent variable is an indicator of whether the person has casted a vote for an Islamic party in the 2011 general elections. The result indicates that at least 3 extra years of education (via earning at least a middle school diploma) is associated with a reduction in the probability of casting a vote for an Islamic party by 22 percentage points in the case of females. Column (8) of Table 2 displays the results of the analysis where the dependent variable is an indicator of whether the respondents would vote for an Islamic party if elections were held this Sunday (in 2012). The coefficients of education are similar between columns (7) and (8) in Table 2. This is not surprising because of the short time distance between the elections in 2011 and the administration of the survey in 2012. In fact, the majority of the sample has not changed its voting preference between the election in 2011 and the time when they are surveyed. More generally, information is available on 5834 people on regarding how they voted in 2011 and also how they would vote now. As Table 11 of the Appendix shows, 3179 people (54.5%) indicated that they voted for an Islamic party in 2011 and they would vote again for an Islamic party today, while 40.3% revealed that they have not voted for an Islamic party and they would not vote for an Islamic party today. Five percent of this sample indicated that they would switch their vote. Although voting preferences are highly consistent between 2011 and 2012, it is useful to classify voters into two groups and investigate the extent to which education impacts movement between these two groups. In this analysis, the first group consists of those who have *not voted* for an Islamic party in 2011 and who declared that they *would not vote* for an Islamic party today either. For these voters, the variable *Never Vote Islamic* takes the value of 1. This variable takes the value of zero for individuals who have voted for an Islamic party in 2011 and/or indicated that they would vote for an Islamic party today. The result, reported in column (9) of Table 2, is consistent with those reported in previous two columns. An increase in secular education, generated by the reform, is associated with the propensity for having political preferences that are consistently *against Islamic parties*.

Control variables used in these regressions also reveal insights into the religiosity and political preferences of young adults in the Republic of Turkey. For example, being a Sunni Muslim (as opposed to being an Alevite Shii'te Muslim or being an adherent of another sect of Islam) has a significant positive impact on the propensity of being religious and a negative effect on the likelihood of being an atheist. It also has a negative impact on the propensity to self-identify as having a modern lifestyle. Being a Sunni has also a significant impact on the propensity to vote for Islamic parties. Being an Alevite Shii'te has the exact opposite effects as being a Sunni. People of Kurdish or Zaza ethnicity have higher probability of being an atheist in comparison to Turks (which is the left-out category in the regressions). Kurds and Zazas are less likely to vote for Islamic parties. A potential reason for this result is the fact that Kurds are more likely to vote for BDP, which is a political party with Kurdish identity.

Table 3 presents the OLS results for males. The associations between education and religiousness as well as between education and voting behavior exhibit a pattern which is similar to that of women. The coefficient on holding at least a middle school diploma, however, is roughly half the magnitude we observed among women in the previous table.

The impact of the law on educational attainment If unobserved determinants of schooling also influence religiosity and voting, the results displayed in Tables 2 and 3 do not correspond to the causal effect of education. To obtain the causal impact of

formal education on outcomes of interest, we implement an instrumental variable estimation strategy, where having at least middle school degree is instrumented with exposure to the 1997 education reform.

Table 4 displays the first-stage results obtained from Eq. (2) for females and males in columns (1) and (2), respectively. Column (1) shows that exposure to the law increases the propensity of women to have at least a middle school education by about 14 percentage points, which is a 26% increase relative to the mean middle school diploma rate of 0.54 in the comparison group. The result for males in column (2) indicates a 6-percentage-point impact, which translates into an 8% increase in the probability of having at least a middle school education relative to those who were not bound by the reform. In summary, the results in Table 4 reveal the effectiveness of the reform in terms of increasing educational attainment, especially for females.

The fact that the impact of the reform was significant for both men and women and that the magnitude of the impact was larger for women have been reported by other researchers as well (Mocan 2013; Kirdar et al. 2014; Dinçer et al. 2014; Cesur et al. 2014; Dursun and Cesur 2016). We confirm this result in our data.

Table 4 The impact of exposure to the education reform on the propensity to have at least 8 years of education—OLS regressions

	(1) Females	(2) Males
Exposure to the law	0.138***	0.062**
	(0.035)	(0.026)
	[0.040]	[0.029]
Age	−0.039	0.036*
	(0.029)	(0.019)
Age squared	0.000	−0.001**
	(0.001)	(0.000)
Sunni	−0.036	−0.025
	(0.042)	(0.026)
Alevite Shiite	0.119**	−0.003
	(0.045)	(0.034)
Kurdish or Zaza ethnicity	−0.175***	−0.063**
	(0.039)	(0.026)
Arabic or Other ethnicity	−0.052	−0.039
	(0.033)	(0.028)
N	4694	4896

The entries in parentheses are standard errors of the estimated coefficients, clustered by birth province-age level. Twelve regions and five age groups yield 60 clusters. Standard errors, which are presented in brackets, are clustered by region of birth-exposure to the law, generating 24 clusters. Exposure to the Law = 1 if the person was born between 1987 and 1994, it is zero if the year of birth is between 1980 and 1985. The 1986 cohort is excluded as whether those born in 1986 were bound by the reform is uncertain. If Kurdish or Zaza Ethnicity = 0 and Arabic and Other Ethnicity = 0, the individual is a Turk. Regressions include region fixed effects and monthly dummies for the survey month, as well as dummies for region of birth

*Statistical level at the 10% level; **Significance at the 5% level; ***Significance at the 1% level or better

Causal estimates of religiosity, electoral participation, and Islamic voting The instrumental variable estimates of the effects of extended primary schooling on religiosity, electoral participation, and the likelihood of voting for Islamic political parties are shown in Table 5 for females (panel A) and males (panel B).

The first-stage F statistics in the female sample, shown in panel A of Table 5, are larger than 10 in all cases (except in column 9). Column (1) shows that having at least a middle school diploma reduces women's propensity to declare themselves as religious by about 30 percentage points (about 43% in comparison those who are in the treatment group). It increases their propensity to declare themselves as being modern by 29 percentage points, and reduces the propensity to wear a head scarf, religious turban, or burka by about 40 percentage points. Having at least a middle school diploma has a negative impact on the propensity to vote for Islamic parties by about 50 percentage points. Thus, Panel A of Table 5 demonstrates that, in the case of females, secular education has a substantial impact on religious attitudes and political tendencies that are influenced by religion.

Addressing the endogeneity of schooling increases the estimated coefficient on *Middle School Diploma* by 15 to 170% for women in comparison to those obtained from the OLS models, presented in Table 2. As discussed in Section 2, the 1997 education reform required populations with a relatively low interest in additional schooling to obtain at least a middle school diploma. Thus, the fact that the four estimates are larger than the OLS results is consistent with the explanation that the marginal effect education on women's religiosity may be bigger among those with a lower tendency to receive additional schooling (Card 2001; and Dursun et al. 2017).

Panel B of Table 5 shows that for men, education has no statistically significant impact on either religiosity or the propensity to vote for an Islamic party. It should be noted, that the first-stage regressions are not very powerful in these specifications for men, with F values around 6.

5 Robustness and potential explanations

In this section, we present a number of alternative specifications to investigate the coherence and robustness of the results. First, we ran reduced form regressions, where the outcomes are regressed on the treatment dummy as well as on other control variables. The reduced form estimates, presented in Table 12 in the Appendix, are in line with our main findings shown in Table 5.

Second, we plotted the residuals obtained from the reduced form regressions, displayed in Figs. 9, 10, 11, 12, 13, 14, and 15 in the Appendix. These graphs show, once again, that exposure to the reform has an impact on the outcomes analyzed, with the exception of males (in particular, males' propensity to vote for Islamic parties, shown in Fig. 15). Thus, Figs. 9, 10, 11, 12, 13, 14, and 15 are consistent with the results displayed in the Table 5.

Third, instead of linear and quadratic terms in age, we estimated models allowing for differential age trends in the treatment and control groups, and obtained a very similar pattern of results.[25] Fourth, some individuals who were born in 1986 were impacted by

[25] These estimates, which are not reported in the interest of space, are available from the authors upon request.

Table 5 The impact of education on religiosity, the propensity to cast a vote, and the propensity to vote for an Islamic party, instrumental variables regressions

Variables	(1) Religious	(2) Atheist	(3) Modern	(4) Wears head cover	(5) Voter 2011	(6) Voter now	(7) Voted Islamic in 2011	(8) Islamic voter now	(9) Never vote Islamic
	Panel A: female sample								
Middle school diploma	−0.298**	0.072	0.293**	−0.399**	0.044	0.078	−0.518**	−0.537***	0.607**
	(0.152)	(0.049)	(0.148)	(0.203)	(0.119)	(0.101)	(0.224)	(0.177)	(0.281)
	[0.145]	[0.043]	[0.125]	[0.225]	[0.112]	[0.095]	[0.242]	[0.209]	[0.325]
N	4694	4694	4641	4659	4135	3782	3527	3489	2958
1st Stage *F* test	15.55	15.55	15.66	15.59	14.38	17.14	13.16	16.86	9.66
P value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Panel B: Male Sample								
Middle school diploma	−0.549	0.130	0.252	–	−0.551	−0.141	0.077	−0.112	0.150
	(0.506)	(0.101)	(0.390)	–	(0.371)	(0.264)	(0.397)	(0.412)	(0.338)
	[0.486]	[0.105]	[0.456]	–	[0.383]	[0.236]	[0.424]	[0.400]	[0.336]
N	4896	4896	4826	–	4195	4086	3396	3725	2876
1st Stage *F* test	5.69	5.69	6.17	–	7.25	6.88	7.52	6.30	7.18
P value	0.018	0.018	0.01	–	0.01	0.01	0.01	0.01	0.01

The entries in parentheses are standard errors of the estimated coefficients, clustered by birth province-age level. Twelve regions and five age groups yield 60 clusters. Standard errors, which are presented in brackets, are clustered by region of birth-exposure to the law, generating 24 clusters. Exposure to the Law = 1 if the person was born between 1987 and 1994, it is zero if the year of birth is between 1980 and 1985. The 1986 cohort is excluded as whether those born in 1986 were bound by the reform is uncertain. If Kurdish or Zaza Ethnicity = 0 and Arabic and Other Ethnicity = 0, the individual is a Turk. Regressions include region fixed effects and monthly dummies for the survey month, as well as dummies for region of birth

*Statistical level at the 10% level; **Significance at the 5% level; ***Significance at the 1% level or better

the law, while others of the same cohort were not bound by the law. As explained in Section 2 above, even if the exact birth dates were known, it is impossible to determine whether the person was exposed to the reform. Therefore, the regressions reported in the paper excluded the 1986 cohort. We, however, estimated the models by including those who were born in 1986 and assigning them the value of one third for the treatment. The results, reported in Table 13 in the Appendix, are extremely similar to those obtained from the benchmark specification.[26]

Fifth, in Table 14 of the Appendix, we excluded people who were enrolled in school and re-estimated the models. This is potentially important in the case of wearing a head cover because it was against the law in 2012 to wear a head cover inside most public institutions, including schools. Although sample sizes get smaller when we drop students, the estimated impact of the middle school diploma has not changed substantively either in magnitude or in statistical significance.

Sixth, the dependent variable Islamic Voter Now measures whether people would vote for an Islamic party if general elections were held today. This question, as all other questions in the survey, was posed to the respondents in 2012. The 2011 general elections were won by an Islamic party (AKP), and therefore Turkey was governed by an Islamic party in 2012.[27] Thus, a declaration in favor of voting for a non-Islamic party in 2012 could reflect a person's dissatisfaction with the policies of the current Islamic government. While the survey does not ask whether the participants approve government policies, it contains questions about personal economic circumstances of the respondents. We created the variable *Can Make Ends Meet* that takes the value of 1 if the respondent indicated that he/she was financially comfortable and could even save some money last month, or although not comfortable financially, managed to make ends meet last month. The variable takes the value of zero if the person indicated financial difficulty, difficulty in paying the bills, or having the need to borrow money to make ends meet last month. We also used a variable that asks the respondents whether they "expect personal economic hardship during the next months." Our hypothesis is that, all else the same, individuals who have difficulty making ends meet or who expect personal economic hardship would be more inclined towards voting against the current Islamic government. If less-educated individuals face economic hardship and if they intend to cast a vote against the current government as a result of their difficult economic circumstances, then their propensity to vote against Islamic parties (the strongest one of which is the governing Islamic party) may be misconstrued as the impact of education. Under this scenario, the impact of education would be biased away from voting for an Islamic party. Alternatively, younger cohorts, who are more educated, may face tougher economic challenges and/or they may be more pessimistic about their economic future in comparison to older and less-educated cohorts. In that case, the younger and the more educated would cast their vote against the current Islamic government, not because of the causal impact of education but because of their own economic circumstances. In Table 15, we report the instrumental variables estimates of the effect of Middle School Diploma on Islamic Voter Now by controlling for these two new variables that gauge the personal economic circumstances of survey

[26] We also estimated our specifications by assigning 0.5 to the treatment status of those born in 1986. This exercise also produced similar results.

[27] In fact, AKP has governed Turkey since 2002.

participants. These results show that voters who are concerned about their own economic well-being plan to vote against the Islamic party that was in power in 2012. On the other hand, controlling for these variables has no effect on the magnitude of the estimated coefficients of education.

In the analyses, we employed the cohorts that were born between 1980 and 1994. These individuals were 18 to 32 years old when they were surveyed in 2012. We re-estimated the models by narrowing the window of cohorts by using the cohorts of 1980–1992 and 1982–1992. As the sample sizes became smaller, the statistical significance of the estimates got jeopardized, but the point estimates remained very similar to those reported in Tables 5. These results are reported in Table 16.

Are the results due to a cohort effect? Our data set is based on a survey conducted in 2012. Younger individuals in the data (18–25 years old in 2012) are treated by the reform, while older ones (27 to 32 years old in 2012) are not exposed to the reform. All regressions control for linear and quadratic age (or trends in age that differ by treatment status), but it could still be argued that some unobserved factors might have impacted those who are 25 or younger in comparison to those who are 27 or older, and that this could be the reason for identified impact of education. To address this point, we use a survey conducted in 2008 by the same company (KONDA) that provided the data used in the paper. The 2008 survey is smaller in sample size, but it is also nationwide and it includes the same questions on modernity and wearing a head cover (head scarf, turban, or burka) as well as information on other key variables that are employed in regressions, including education, age, religious sect, and ethnicity.

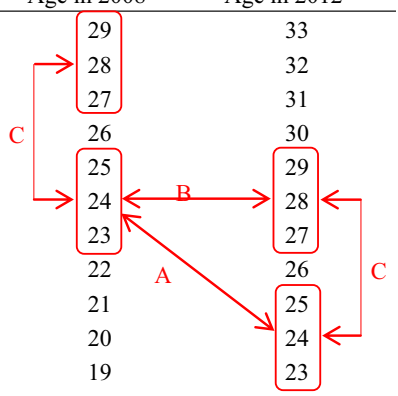
Using both the 2012 and the 2008 data sets, we investigate whether the results could have been driven by cohort effects. Consider Table 6, which summarizes the cohort information pertaining to the 2012 data used in the paper, as well the information on the 2008 data. Specifically, columns (1) and (2) of Table 6 display exposure to the law and the year of birth, and column (4) shows the age of the individuals in 2012. For example, someone who was born in 1984 was not exposed to the law, and he/she was 28 years old in 2012. Column (3) shows the age of the same people in 2008.

From the 2008 data, we extract those who were 23, 24, or 25 years old in 2008. The descriptive statistics of the group are provided in the left panel of Table 17 of the Appendix. We also extract people *of the same age group* from the 2012 data. These two groups are represented by the two boxes in Table 6, connected by arrow A. Those who are 23, 24, or 25 years old in 2012 *are treated by the reform*, but those who are 23, 24, or 25 in 2008 *are not exposed to the reform*. Thus, we create a sample of 23–25 year olds using both the 2008 and 2012 surveys and assign a value of 1 for the treatment dummy for those who are surveyed in 2012, and zero for those who are surveyed in 2008. Regressions using this sample allow us to investigate if the results of the benchmark regressions are driven by the age difference between the treatment and control groups. Similarly, we also create a subsample and run the instrumental variables regressions using those who are (23 or 24) in 2008 or in 2012.

The results are reported in Table 7. All regressions in the table specify every control variable used in previous regressions including region of survey and region of birth fixed effects. Because the inclusion of age and age squared creates multi-collinearity when the age range is only 2 years (panel B of Table 7), we omit age squared. Panel A of Table 7 displays the results that pertain to the sample of 23–25 year olds. Column (1)

Table 6 Exposure to the law in the 2012 and 2008 survey years and graphical representation of the samples used in Tables 7, 8, 18 and 19

(1) Exposure to the Law	(2) Year of Birth	(3) Age in 2008	(4) Age in 2012
No	1979	29	33
No	1980	28	32
No	1981	27	31
No	1982	26	30
No	1983	25	29
No	1984	24	28
No	1985	23	27
Uncertain	1986	22	26
Yes	1987	21	25
Yes	1988	20	24
Yes	1989	19	23
Yes	1990	18	22
Yes	1991	17	21
Yes	1992	16	20
Yes	1993	15	19
Yes	1994	14	18



presents the results of the instrumental variables regression for men where the dependent variable is Modern. The sample consists of 1258 observations and about 83% of these come from the 2012 survey. The first-stage regression is powerful with an F value of about 30 and the estimated coefficient of middle school education indicates that having at least a middle school diploma increases the propensity for modernity by 74 percentage points for men. Column (2) presents the same regression for females and demonstrates that education has a positive impact on modernity, which is not significant at conventional levels. This sample consists of 1211 women who are 23–25 years of age, and only 215 of them come from the 2008 survey (for whom the treatment value is equal to zero). This means that the imprecision of the estimate may be due to small variation in the treatment. Despite small variation in the treatment variable, column (3) shows that education has a significantly negative impact on the propensity to wear a head cover.

Panel B of Table 7 displays the same results, but these samples use individuals who are 23 or 24 years old in 2008 or in 2012. Thus, these samples are even smaller, but the results are consistent with those reported in panel A.[28] In summary, the results in Table 7 indicate that the impact of education reported in Tables 3, 4, and 5 in the paper are not due to the age difference between those who are exposed to the education reform and those who are not exposed.

We conduct another test to investigate whether age effects are responsible for the estimated impact of education. In our primary analysis sample, age is negatively

[28] The exception is column (2) where the first-stage is not powerful and the estimated coefficient of education is greater than one.

Table 7 Instrumental variables regressions using individuals ages 23–25 or ages 23–24 in 2008 and 2012 (arrow A in Table 6)

Variables	(2) Modern (males)	(3) Modern (females)	(4) Wears head cover
	Panel A: Ages 23–25		
Middle school diploma	0.741***	0.104	−0.648***
	(0.198)	(0.217)	(0.180)
	[0.282]	[0.202]	[0.159]
N	1258	1211	1215
1st Stage *F* test	20.13	43.58	41.17
P value	0.00	0.00	0.00
	Panel B: Ages 23, 24		
Middle school diploma	1.154***	0.132	−0.570*
	(0.287)	(0.312)	(0.306)
	[0.240]	[0.291]	[0.300]
N	824	746	752
1st stage *F* test	7.506	13.14	13.41
P value	0.00	0.00	0.00

Individuals are of the same age in different years (2008 or 2012). Exposure to the Law = 1 if the person was 23–25 years old in 2012 and it is zero if the person was 23–25 in 2008 (See Table 6). Regressions control for year-of-birth dummies. The entries in parentheses are standard errors of the estimated coefficients, clustered by birth province-age level. Standard errors, which are presented in brackets, are clustered by region of birth- and exposure to the Law. The 1986 cohort is excluded as whether those born in 1986 were bound by the reform is uncertain. Regressions also include age, religious sect dummies, dichotomous ethnicity indicators, region fixed effects as well as dummies for region of birth

*Statistical level at the 10% level; **Significance at the 5% level; ***Significance at the 1% level or better

correlated with education. More precisely, younger individuals had exposure to the education reform while older individuals were not treated by the law. We simulate a scenario to test whether aging of the same cohort can explain the variation in religiosity. Consider those who are 23–25 in 2008. This group is not exposed to the reform. Four years later, in 2012, this group becomes 27–29 years old. We create a sample, consisting of individuals who are 23–25 in 2008 and those who are 27–29 in 2012. We assign a placebo treatment, which takes the value of 1 for those in the younger group (23–25) and zero in the older group (27–29). Note again that *nobody* in this sample is exposed to the treatment by the reform. However, if being young alone is responsible for less religiosity and more modernity, then our placebo treatment ($T = 1$ for ages 23–25 of the 2008 survey, and $T = 0$ of 27–29 of the 2012 survey) should explain these outcomes. (see arrow B in Table 6).

Tables 18 and 19 present the results of this analysis. Table 18 displays the results where the dependent variable is an indicator of having at least a middle school education. This table is counterpart of Table 4, which displays the first-stage estimates. Because neither the individuals from the 2008 survey nor those from the 2012 survey are exposed to the law in this sample, their education level is not expected to be different from each other. This is confirmed in Table 18, where the coefficient of the

placebo treatment dummy is not different from zero. This in turn indicates that the instrumental variable regressions that use the placebo dummy as an instrument for education would be meaningless. Instead, we run reduced form regressions where modernity and wearing a head scarf are regressed on the full set of explanatory variables and the placebo treatment dummy. This specification investigates whether religiosity of individuals of the same cohort (born in 1983, 1984, or 1985; see arrow B in Table 6*)* changes as they get older. Table 19 displays the results. Each regression includes the explanatory variables used previously, as well as year-of-birth fixed effects. The key variable is titled *Exposure to the Placebo Law*, which takes the value of 1 for those who are 23–25 years old in 2008, and takes the value of zero for those who are 27–29 in the 2012 survey. As Table 19 shows, the estimated coefficients of *Placebo Treatment* are small and not different from zero, indicating that being young is not a confounder of the impact of education on religiosity reported earlier.

Difference-in-differences Finally, we estimate a difference-in-differences specification. We consider individuals who are 23–25 or 27–29 in 2012. These are the people who are on both sides of the education reform: those who are 23–25 in 2012 were treated by the reform, while those who are 27–29 missed it.[29] We also consider people of the same exact age from the 2008 survey (the descriptive statistics of this group of individuals surveyed in 2008 are provided in the right-hand side panel of Table 18). Although the 2012 and 2008 groups are of the same age, *nobody in the 2008 group is exposed to the reform*. (This design is depicted by arrow C in Table 6). We create a dummy variable *Young*, which takes the value of one if the person is 23–25 years old, and zero otherwise. We create a second indicator variable, *Year2012*, which identifies whether the individual was surveyed in 2012.

We estimate the following model.

$$R_i = \alpha + X_i\Phi + \lambda_1 \text{Young}_i + \lambda_2 \text{Year2012}_i + \lambda_3 \text{Young}_i \times \text{Year2012}_i + \tau_i, \quad (3)$$

where λ_1 is the impact of being young (as opposed to being 27–29 years old) in 2008 on modernity or on the probability of wearing a head cover, and λ_3 represents the dif-in-dif magnitude: it is the differential impact of being young in 2012 versus being young in 2008. As the young group surveyed in 2012 has been treated by the reform while their counterparts surveyed in 2008 have not, λ_3 is an estimate of the reduced form effect of the exposure to the reform.

The results are presented in Table 8. In column (1), which pertains to women, the estimate is 0.075 and significantly different from zero. Similarly, the dif-in-dif estimate in column (2) indicates an impact of 9 percentage point reduction in the probability of wearing a head cover. In column (3), which displays the results of the regression where the dependent variable is modernity for men, the dif-in-dif estimate is not statistically different from zero. Thus, the dif-in-dif estimates confirm the results provided by the instrumental variables regressions.

[29] As we have done throughout the paper, those who are 26 years old in 2012 are excluded in the benchmark models because some individuals of this cohort may be exposed to the law while some other are certainly not exposed.

Table 8 Difference in difference analysis using the 2008 and 2012 surveys (arrow C in Table 6)

Variables	(1) Modern (males)	(2) Modern (females)	(3) Wears head cover
Young	−0.042	−0.096*	0.102**
	(0.052)	(0.056)	(0.048)
Year 2012	0.090***	−0.056***	−0.015
	(0.025)	(0.014)	(0.028)
Young × (year 2012)	0.008	0.075*	−0.088*
	(0.048)	(0.044)	(0.048)
	[0.051]	[0.049]	[0.049]
N	2617	2616	2637

The sample consists of those who are 23–25 or 27–29 in either 2008 or 2012. *Young* = 1 if the person is 23–25 years old. *Year2012* = 1 if the person is surveyed in 2012. No individual who is 23–29 in 2008 is exposed to the law. Those who are young (23–25) in 2012 *are* exposed to the law. The entries in parentheses are standard errors of the estimated coefficients, clustered by birth province-age level. Standard errors, which are presented in brackets, are clustered by region of birth-exposure to the law. If Kurdish or Zaza Ethnicity = 0 and Arabic and Other Ethnicity = 0, the individual is a Turk. The 1986 cohort is excluded as whether those born in 1986 were bound by the reform is uncertain. Regressions also include age, religious sect dummies, dichotomous ethnicity indicators, region fixed effects as well as dummies for region of birth

*Statistical level at the 10% level; **Significance at the 5% level; ***Significance at the 1% level or better

Heterogeneous effects by urban versus rural living status The impact of education may vary based on where the survey participants live. On the one hand, education may have a greater impact on religiosity of women who live in rural areas if increased schooling induces them to question the credibility of traditional norms that are closely related to religion. Alternatively, if lifestyles and behaviors of peers are influential in determining the link between education religiosity, those who live in urban areas may be more prone to secularizing effects of extended schooling as they may be more likely to be exposed to more educated and less religious peers in these less conservative urban areas. In Table 9, we display the instrumental variable coefficients of education by urban versus rural residence.[30]

The results, presented in panel A of Table 9, show that the effects of schooling on both self-reported religiosity and the likelihood of voting for Islamic parties for women living urban locations are 5 to 57% larger in magnitude and more precisely estimated in comparison to the baseline results which are displayed in panel A of Table 5. In panel B of Table 9, when we turn our attention to females living in rural areas, we observe that none of the coefficients of education is statistically significant. Furthermore, the coefficients in columns (1) to (4) have the reverse signs, and in panel B, we find that extended schooling has a positive effect on the likelihood of voting if the elections were held this Sunday.

The results shown in Table 9 imply that the impact of education on religiosity and the support for religious parties is not working through an increase in cognitive ability

[30] We also re-estimated the effect of education on religiosity of men using the urban and rural samples. These estimates did not produce results which are different from the baseline specification among males that are shown in panel B of Table 5.

Table 9 The impact of education on religiosity, the propensity to cast a vote, and the propensity to vote for an Islamic party, instrumental variables regressions females, urban versus rural sample estimates

Variables	(1) Religious	(2) Atheist	(3) Modern	(4) Wears head cover	(5) Voter 2011	(6) Voter now	(7) Voted Islamic in 2011	(8) Islamic voter now	(9) Never vote Islamic
	Panel A: urban sample								
Middle school diploma	−0.469**	0.101	0.380**	−0.566***	0.040	−0.061	−0.576**	−0.701***	0.635*
	(0.196)	(0.062)	(0.173)	(0.214)	(0.126)	(0.118)	(0.260)	(0.236)	(0.339)
N	3817	3817	3772	3791	3353	3049	2855	2806	2379
1st stage *F* test	11.49	11.49	11.23	11.15	11.06	11.80	8.047	9.634	5.216
P value	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.02
	Panel B: Rural sample								
Middle school diploma	0.343	−0.012	−0.082	0.223	0.140	0.561**	−0.168	0.002	0.405
	(0.365)	(0.069)	(0.336)	(0.450)	(0.323)	(0.278)	(0.352)	(0.301)	(0.378)
N	877	877	869	868	782	733	672	683	579
1st stage *F* test	5.332	5.332	5.973	5.375	4.159	5.947	4.211	6.445	3.643
P value	0.025	0.025	0.018	0.024	0.046	0.018	0.045	0.014	0.061

The entries in parentheses are standard errors of the estimated coefficients, clustered by birth province-age level. Twelve regions and five age groups yield 60 clusters. Standard errors, which are presented in brackets, are clustered by region of birth-exposure to the law, generating 24 clusters. Exposure to the law = 1 if the person was born between 1987 and 1994, it is zero if the year of birth is between 1980 and 1985. The 1986 cohort is excluded as whether those born in 1986 were bound by the reform is uncertain. Regressions also include age, age squared, religious sect dummies, dichotomous ethnicity indicators, region fixed effects as well as dummies for region of birth

*Statistical level at the 10% level; **Significance at the 5% level; ***Significance at the 1% level or better

on the margin analyzed (an increase in education from 5 to 8 years). Because, if this were the case, an increase in education would have similar impacts in both urban and rural samples, unless one is willing to argue that the increase in mandatory years of education has an impact on cognitive development of children in urban areas, but that it has no such impact in rural areas. That the results are significant for females in urban areas may suggest that the impact could be due to enhanced exposure to peers, social networks, and cultural experiences, driven by 3 extra years of education during the formative teenage years. Other channels are also likely. For example, to the extent that an increase in schooling, triggered by this reform, increases young women's wages (Mocan 2013), women's labor force participation would rise, possibly leading to a change in religious preferences.

6 Summary and discussion

Education is shown to change individuals' preferences in a number of dimensions, ranging from time discounting to intolerance for violence. Whether education affects religiosity, however, has been a difficult question to answer because of the empirical challenge it presents.

The impact of education on religiosity is also important to investigate because of the implications for political economy of development. During the last decade, there has been a surge of political Islam in the Middle East and North Africa. These countries are characterized by low per capita income, low levels of education, low level of democracy, and high religiosity.[31] If secular education has a causal impact on religiosity and on voter preferences for Islamic parties, education policies can impact political landscape of these developing countries.

In this paper, we investigate the impact of education on religiosity and the propensity to cast a vote for Islamic parties. We exploit an education reform in Turkey that was enacted unexpectedly and implemented rather quickly. The law that was passed in August 1997 increased the mandated years of education from 5 to 8 years for those students who were about to start the fifth grade or lower in the Fall of 1998. There was no change in curriculum.

We employ a unique nationally representative data set which gauges *religiosity* and *voting behavior* of individuals in Turkey in 2012. In addition, the data set includes information that is not available in standard data sets, such as ethnic background of the survey respondents (e.g., being Kurdish or Arabic), as well as information on the religious sect of the individuals, such as whether they are Sunni Muslim or Alevite Shii'te.

Religiosity is measured by whether individuals are atheists, believers, and religious or devout Muslims. We also investigate the impact of education on self-declared lifestyles such as being a religious conservative, conventional conservative, or modern. In the case of women, we analyze whether an increase in education has an impact on a strong indicator of religiosity in Islam: the propensity to wear a head cover such as a head scarf, or burka, or a religious turban.

[31] With the exception of Israel and Cyprus, the predominant religion in these countries is Islam. See Table 10 in the Appendix about income, education, religiosity and democracy in these countries.

Importantly, the data set includes information on the specific political party the individuals have voted for in the 2011 general elections and how they would vote if elections were held today. Using this information, we investigate the impact of education on the propensity to participate in elections as a voter and on the propensity to vote for an Islamic party.

We first analyze whether the education reform has in fact increased educational attainment, and find that exposure to the reform has increased the propensity to have at least a middle school education (≥8 years). The impact is particularly strong for females.

We use exposure to the reform, determined by the year of birth, as an instrument for educational attainment. Instrumental variable regressions show that, for women, education lowers the propensity for being religious and it decreases the probability of wearing a head/body cover such as a headscarf or burka. Education increases the propensity of women to identify themselves as having a modern lifestyle. On the other hand, education has no statistically significant impact on men's religiosity. For either men or women, education has no impact on electoral participation; that is, increased education does not make individuals more likely to vote in a general election. This result is in contrast to the research on developed countries which, in general, identified a positive impact of education on voter turnout.

Finally, and importantly, we find that education makes women less likely to vote for an Islamic party. This is true for those who voted in the 2011 elections and in the analysis of how they would vote if elections were held today. Because, in 2012, Turkey was governed by a party with Islamic roots (Justice and Development Party—AKP), the tendency to cast a vote against this party today could in part be a reflection of dissatisfaction with current economic circumstances. We control for two variables that gauge whether individuals face economic difficulty and whether they foresee personal economic hardship in the months ahead. While these variables negatively impact the propensity to vote for the incumbent Islamic party, inclusion of these variables in the models had no influence on the negative impact of education on the propensity to vote for the governing Islamic party. For men, the impact of education on the propensity to vote Islamic is not different from zero. The results are robust to how the 1986 cohort is treated and to the exclusion of current students from the analyses.

Our data set is from the year 2012, and younger individuals in the data have been exposed to the education reform, while older ones were exempt from the mandate of the reform. Although all regressions control for age, it can still be argued that some unobserved factors might have impacted younger individuals differently in comparison to older ones, and that this could be the reason for the identified impact of education. Even though the dramatic change in behavior, presented in Figs. 1, 2, 3, 4, 5, 6, and 7 and Figs. 9, 10, 11, 12, 13, 14, and 15 in the Appendix, indicate that this is unlikely, we address this concern by using a smaller but similar survey from 2008 that includes all key variables and information on individuals' modernity, and in the case of women, whether they wear a head cover. Using these 2 years of data enables us to conduct a variety of tests, including a difference-in-differences specification, which show that the identified impact of education is not due to a cohort effect.

These results show that education alters women's preferences on religiosity and their political tendencies to vote for an Islamic party. It is interesting that no such statistically significant impact of education exists for men. Secular middle school education, which is mandated by the new law, consists of a standard curriculum including a wide range of courses from mathematics to literature, from history to geography. While exposure to such subject matters and the corresponding increase in cognition may alter preferences, the difference in the impact of education between males and females suggests that the change in preferences may not be driven by what is taught in the classroom.

An alternative explanation could involve being "outside of the home." It should be noted that female labor force participation is low in Muslim countries and Turkey is no exception. The labor force participation rate of women ages 15–24 was 32% in 1997, while the rate was double (63%) for men in that same year. This difference, stemming from both economic and cultural factors, indicates higher rates of girls and young women stay at home. Thus, it could be the case that the education mandate allowed girls to be exposed to a larger network of friends, ideas, and experiences, and enabled them to socialize outside the home and to participate in society more heavily via school attendance between the ages of 12–15, when such experiences could have long-lasting effects.[32]

One way to indirectly test whether the impact of education operates through the social environment is to restrict the estimation samples to urban and rural locations and re-estimate the relationship between education and religiousness. That is, while the opportunities for interacting with less religious people may increase with education in urban areas, this is not necessarily true for those who live in rural locations as a significantly greater share of people who live rural areas exhibit a conservative lifestyle. For instance, while 58% of the women who live in urban areas wear a head cover in our sample, the rate is 80% among women residing in rural eras. Similarly, about 29% of women who live in urban areas consider themselves as modern, but only about 13% of those in rural areas report being modern. Our analysis shows that the effects are driven by women who live in urban areas. Thus, socialization is a likely mediating pathway between female education and religiosity.

Our results indicate that an increase in schooling lowers the religiosity of young women (ages 18 to 32) who reside in urban areas. There is evidence that the education reform we analyze in this paper has an impact on a variety of other outcomes ranging from fertility to marital status to wages (e.g., Dinçer et al. 2014, Mocan 2013), and there also exists a vast body of similar evidence from other countries (see Card 2001, Cannonier and Mocan (2017) and the literature they cite). If the variation in these outcomes, triggered by additional years of schooling, has an impact on religiosity, then it is possible for the long-run impact of increased education (e.g., when those who were treatedby the education reform reach the age of 45 or 50) to be different than the medium-term impact we report in this paper.

[32] This explanation is consistent with that reported by Cannonier and Mocan (2017) who found that exposure to an education reform in Sierra Leone has changed the preferences of women regarding matters that impact women's well-being, although the quality of schooling received was likely very low.

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Compliance with ethical standards The authors declare that they have no conflict of interest.

Appendix

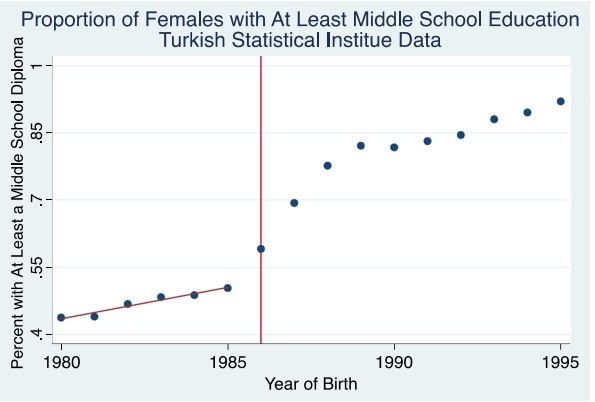

Fig. 8 Proportion of females with at least middle school education Turkish Statistical Institute Data

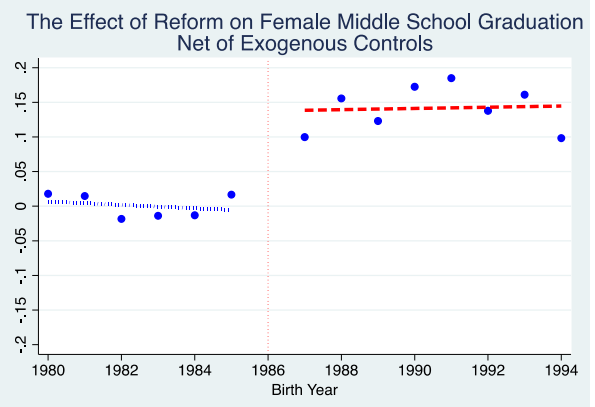

Fig. 9 The effect of reform on female middle school graduation net of exogenous controls

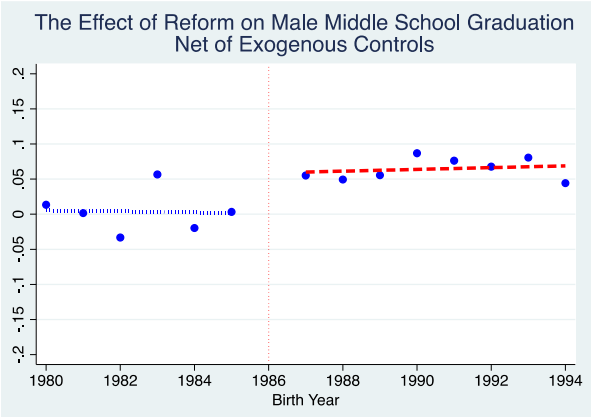

Fig. 10 The effect of reform on male middle school graduation net of exogenous controls

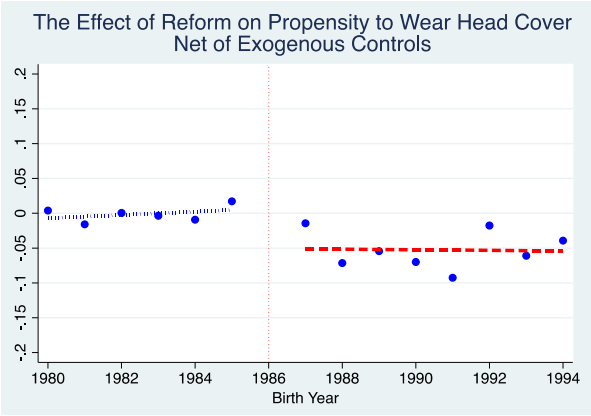

Fig. 11 The effect of reform on propensity to wear head cover net of exogenous controls

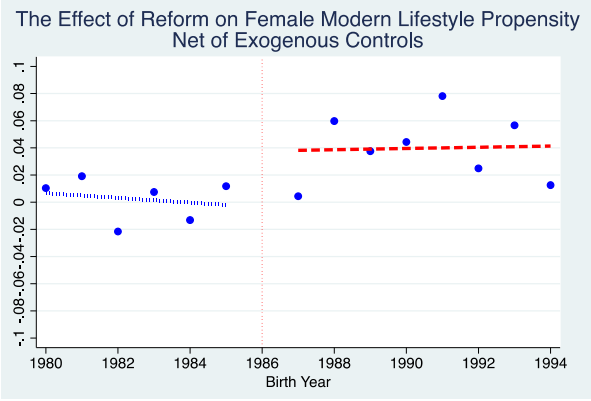

Fig. 12 The effect of reform on female modern lifestyle propensity net of exogenous controls

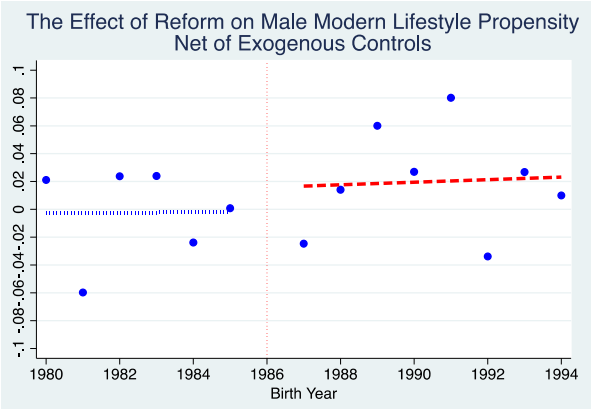

Fig. 13 The effect of reform on male modern lifestyle propensity net of exogenous controls

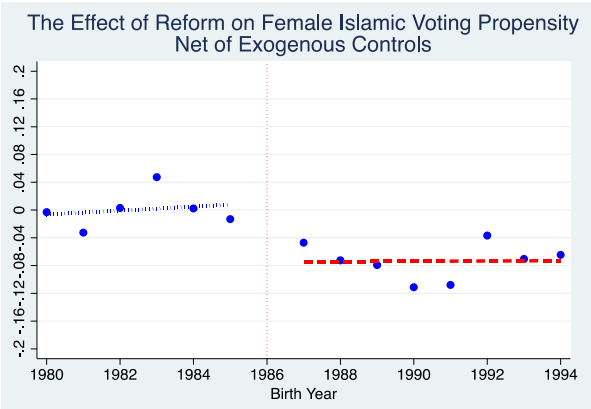

Fig. 14 The effect of reform on female islamic voting propensity net of exogenous controls

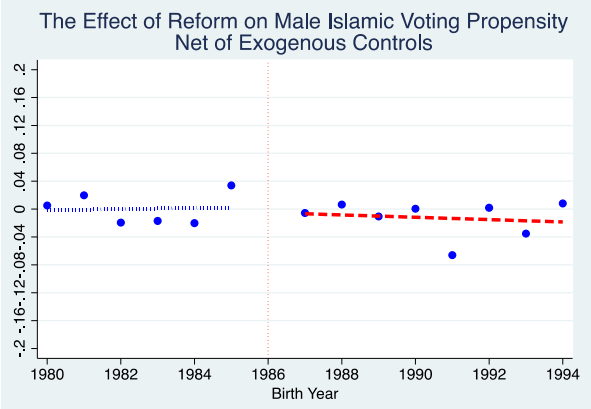

Fig. 15 The effect of reform on male islamic voting propensity net of exogenous controls

Table 10 Selected attributes of a sample of countries in the Middle East, North Africa, and Europe

Country	GDP per capita (current US$ in 2012)	Democracy index in 2012	Average years of total schooling in 2010, for age 25+	Religiosity
Selected attributes of a sample of countries in the Middle East and North Africa with predominantly Muslim populations				
Iraq	6455	4.10	5.58	1.05
Iran, Islamic Rep.	6816*	1.98	7.84	1.28
Turkey	10, 666	5.76	6.47	1.36
Syrian Arab Republic	3289	1.63	4.88	N/A
Egypt, Arab Rep.	3187	4.56	6.37	1.05
Jordan	4945	3.76	8.64	1.05
Tunisia	4237	5.67	6.48	N/A
Algeria	5403	3.83	6.83	1.09
Morocco	2925	4.07	4.36	1.11
Libya	10,456**	5.15	7.52	N/A
Selected attributes of a sample of European countries				
Sweden	55,245	9.73	11.61	2.91
Germany	41,514	9.58	12.21	2.93
France	39,772	7.88	10.43	2.74
England	38,514	9.58	9.13	2.65
Spain	29,195	8.02	10.35	2.76
Italy	33,049	7.74	9.30	1.96
Slovenia	22,001	7.88	11.70	2.68

The data on GDP are from the World Bank. GDP is measured in 2012, except for Iran and Libya, for which the GDP information pertain to years 2011 and 2009, respectively.

The 2012 Democracy Index data are obtained from the Economist Intelligence Unit Report. The scale of the index is from 0 to 10 and the mean among 167 countries is 5.52. The maximum of the index is 9.93 (Norway), the median is 5.86 (Bangladesh), and the minimum is 1.08 (North Korea).

The average years of total schooling for the population aged 25 and over is obtained for the year 2010. The average years of total schooling in all countries is 7.82 years. Source: Barro, Robert and Jong-Wha Lee, "A New Data Set of Educational Attainment in the World, 1950–2010." *Journal of Development Economics*.

The religiosity measure is computed from the World Values Survey (WVS). In the WVS the respondents were asked the following question: "How important is religion in your life? Would you say it is: Very important (coded as 1), Rather important (coded as 2), Not very important (coded as 3), and Not at all important (coded as 4). The reported religiosity measure is the average answer of the country's respondents.

The religiosity measure is calculated using WVS 2005–2007 wave data, with the exception of Algeria, for which the most recent data are available from the 1999–2004 wave. The religiosity measure is not available for Syria, Tunisia, and Libya, as these countries are not in the WVS. The average for all countries in the 2005–2007 wave is 1.91

Table 11 The joint distribution of voters for an Islamic Party in 2011 and now (in 2012)

		Voted for Islamic party in 2011	
		Yes	No
Voted for Islamic party today (in 2012)	Yes	A *N* = 3179 (54.5%) Proportion of this group with at least middle school education = 0.66	B *N* = 157 (2.7%) Proportion of this group with at least middle school education = 0.74
	No	C *N* = 148 (2.3%) Proportion of this group with at least middle school education = 0.81	D *N* = 2350 (40.3%) Proportion of this group with at least middle school education = 0.84

Table 12 The impact of education on religiosity, the propensity to cast a vote, and the propensity to vote for an Islamic Party reduced form regressions

	(1)	(2)	(3)	(6)	(4)	(5)	(7)	(8)	(9)
	Religious	Atheist	Modern	Wears head cover	Voter 2011	Voter now	Voted Islamic in 2011	Islamic voter now	Never vote Islamic
	Panel A: female sample								
Middle school diploma	−0.041*	0.010	0.041*	−0.055*	0.006	0.011	−0.066**	−0.080***	0.070**
	(0.024)	(0.006)	(0.023)	(0.032)	(0.017)	(0.015)	(0.026)	(0.024)	(0.030)
N	4694	4694	4641	4659	4135	3782	3527	3489	2958
	Panel B: male sample								
Middle school diploma	−0.034	0.008	0.016		−0.036*	−0.010	0.005	−0.008	0.011
	(0.030)	(0.006)	(0.024)		(0.019)	(0.018)	(0.027)	(0.029)	(0.027)
N	4896	4896	4826		4195	4086	3396	3725	2876

The entries in parentheses are standard errors of the estimated coefficients, clustered by birth province-age level. Twelve regions and five age groups yield 60 clusters. Standard errors, which are presented in brackets, are clustered by region of birth-exposure to the law, generating 24 clusters. Exposure to the law = 1 if the person was born between 1987 and 1994, it is zero if the year of birth is between 1980 and 1985. The 1986 cohort is excluded as whether those born in 1986 were bound by the reform is uncertain. Regressions also include age, age squared, religious sect dummies, dichotomous ethnicity indicators, region fixed effects as well as dummies for region of birth

*Statistical level at the 10% level; **Significance at the 5% level; ***Significance at the 1% level or better

Table 13 The impact of education on religiosity, the propensity to cast a vote, and the propensity to vote for an Islamic party—instrumental variables regressions treatment is coded = 0.33 for the 1986 birth cohort

Variables	(1) Religious	(2) Atheist	(3) Modern	(6) Wears head cover	(4) Voter 2011	(5) Voter now	(7) Voted Islamic in 2011	(8) Islamic voter now	(9) Never vote Islamic
	Panel A: female sample								
Middle school diploma	−0.391**	0.070	0.321**	−0.443**	0.061	0.108	−0.548**	−0.609***	0.684**
	(0.159)	(0.051)	(0.148)	(0.191)	(0.120)	(0.103)	(0.241)	(0.187)	(0.300)
Observations	5046	5046	4991	5010	4480	4062	3828	3745	3205
1st stage *F* test	14.38	14.38	14.53	14.13	12.36	14.55	11.42	14.22	8.291
P value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Panel B: Male sample								
Middle school diploma	−0.569	0.130	0.099		−0.431	−0.014	0.015	−0.212	0.219
	(0.439)	(0.096)	(0.359)		(0.339)	(0.241)	(0.398)	(0.384)	(0.345)
Observations	5251	5251	5176		4536	4374	3679	3981	3107
1st Stage *F* test	6.889	6.889	6.761		7.707	8.476	8.421	7.573	8.296
P value	0.02	0.02	0.01		0.01	0.01	0.01	0.01	0.01

The entries in parentheses are standard errors of the estimated coefficients, clustered by birth province-age level. Twelve regions and five age groups yield 60 clusters. Standard errors, which are presented in brackets, are clustered by region of birth-exposure to the law, generating 24 clusters. Exposure to the law = 1 if the person was born between 1987 and 1994, it is zero if the year of birth is between 1980 and 1985. The 1986 cohort is excluded as whether those born in 1986 were bound by the reform is uncertain. Regressions also include age, age squared, religious sect dummies, dichotomous ethnicity indicators, region fixed effects as well as dummies for region of birth.

*Statistical level at the 10% level; **Significance at the 5% level; ***Significance at the 1% level or better

Table 14 The impact of education on religiosity, the propensity to cast a vote, and the propensity to vote for an Islamic party—instrumental variables regressions excluding students

	(1) Religious	(2) Atheist	(3) Modern	(6) Wears head cover	(4) Voter 2011	(5) Voter now	(7) Voted Islamic in 2011	(8) Islamic voter now	(9) Never vote Islamic
	Panel A: female sample								
Middle school diploma	−0.287**	0.017	0.219	−0.352**	0.011	0.006	−0.467**	−0.355**	0.507**
	(0.122)	(0.034)	(0.137)	(0.179)	(0.115)	(0.105)	(0.215)	(0.155)	(0.249)
N	3757	3757	3711	3748	3518	3065	3063	2858	2561
1st Stage *F* test	17.21	17.21	17.10	17.21	14.64	16.74	14.74	17.06	10.67
P value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Panel B: male sample								
Middle school diploma	−0.349	−0.086	−0.313		−0.666	−0.237	−0.215	0.148	0.338
	(0.405)	(0.084)	(0.350)		(0.451)	(0.273)	(0.421)	(0.351)	(0.343)
N	3644	3644	3590		3379	3065	2793	2810	2359
1st Stage *F* test	7.762	7.762	8.266		6.354	8.082	6.867	7.363	6.192
P value	0.02	0.02	0.01		0.01	0.01	0.01	0.01	0.01

The entries in parentheses are standard errors of the estimated coefficients, clustered by birth province-age level. Twelve regions and five age groups yield 60 clusters. Standard errors, which are presented in brackets, are clustered by region of birth-exposure to the law, generating 24 clusters. Exposure to the Law = 1 if the person was born between 1987 and 1994, it is zero if the year of birth is between 1980 and 1985. The 1986 cohort is excluded as whether those born in 1986 were bound by the reform is uncertain. Regressions also include age, age squared, religious sect dummies, dichotomous ethnicity indicators, region fixed effects as well as dummies for region of birth

*Statistical level at the 10% level; **Significance at the 5% level; ***Significance at the 1% level or better

Table 15 The impact of education on the propensity to vote for an Islamic party if elections were held today (in 2012)—instrumental variables regressions with control variables measuring personal economic circumstances

	(1) Females	(2) Males
Middle school diploma	−0.545***	−0.080
	(0.173)	(0.427)
	[0.201]	[0.411]
Expect personal economic hardship	−0.102***	−0.138***
	(0.021)	(0.020)
Can make ends meet	0.091***	0.062***
	(0.019)	(0.017)
Age	−0.019	−0.057**
	(0.023)	(0.028)
Age squared	0.000	0.001*
	(0.000)	(0.001)
Sunni	0.086	0.110*
	(0.056)	(0.067)
Alevite Shiite	−0.384***	−0.332***
	(0.068)	(0.067)
Kurdish or Zaza Ethnicity	−0.202***	−0.178***
	(0.051)	(0.041)
Arabic or Other Ethnicity	0.053	0.067
	(0.040)	(0.055)
N	3460	3698
1st Stage *F* test	17.39	6.164
P value	0.00	0.01

The entries in parentheses are standard errors of the estimated coefficients, clustered by birth province-age level. Twelve regions and five age groups yield 60 clusters. Standard errors, which are presented in brackets, are clustered by region of birth-exposure to the law, generating 24 clusters. Exposure to the law = 1 if the person was born between 1987 and 1994, it is zero if the year of birth is between 1980 and 1985. The 1986 cohort is excluded as whether those born in 1986 were bound by the reform is uncertain. Regressions also include age, age squared, religious sect dummies, dichotomous ethnicity indicators, region fixed effects as well as dummies for region of birth

*Statistical level at the 10% level; **Significance at the 5% level; ***Significance at the 1% level or better

Table 16 The impact of education on religiosity, the propensity to cast a vote, and the propensity to vote for an Islamic party—instrumental variables regressions birth cohort intervals (1980 to 1992) and (1982 to 1992)

	(1) Religious	(2) Atheist	(3) Modern	(6) Wears head cover	(4) Voter 2011	(5) Voter now	(7) Voted Islamic in 2011	(8) Islamic voter now	(9) Never vote Islamic
	Females								
	Birth cohorts: 1980 to 1992								
	(Ages 20–32 at the time of the survey)								
Middle school diploma	−0.309*	0.086	0.363**	−0.612***	−0.178	−0.028	−0.493**	−0.530***	0.560**
	(0.159)	(0.057)	(0.155)	(0.230)	(0.130)	(0.120)	(0.198)	(0.184)	(0.250)
N	4063	4063	4022	4047	3909	3296	3370	3061	2814
1st Stage *F* test	16.98	16.98	17.15	17.24	19.34	18.16	19.06	18.74	12.84
	Birth cohorts: 1982 to 1992								
	(Ages 20–30 at the time of the survey)								
Middle school diploma	−0.367	0.142	0.161	−0.864*	−0.501	−0.130	−0.356	−0.528*	0.565
	(0.293)	(0.138)	(0.326)	(0.470)	(0.353)	(0.221)	(0.341)	(0.306)	(0.450)
N	3421	3421	3381	3404	3287	2768	2814	2569	2348
1st Stage *F* test	3.929	3.929	3.167	3.993	4.500	5.535	5.413	4.994	2.860
	Males								
	Birth cohorts: 1980 to 1992								
	(Ages 20–32 at the time of the survey)								
Middle school diploma	−0.247	0.186	0.408		−1.198	−0.353	0.280	0.253	0.033
	(0.595)	(0.153)	(0.570)		(0.755)	(0.435)	(0.569)	(0.539)	(0.437)
N	4046	4046	3984		3908	3378	3199	3094	2702
1st stage *F* test	2.815	2.815	2.870		3.476	3.087	3.314	2.698	3.295
	Birth cohorts: 1982 to 1992								
	(Ages 20–30 at the time of the survey)								
Middle school	0.348	0.266	1.340		−2.276	−1.233	−1.018	−1.000	0.876
Diploma	(1.192)	(0.331)	(1.636)		(2.290)	(1.546)	(1.181)	(1.279)	(0.774)
N	3462	3462	3410		3339	2893	2702	2643	2285
1st stage *F* test	1.089	1.089	0.904		0.961	0.903	1.380	1.021	1.862

The entries in parentheses are standard errors of the estimated coefficients, clustered by birth province-age level. Twelve regions and five age groups yield 60 clusters. Standard errors, which are presented in brackets, are clustered by region of birth-exposure to the law, generating 24 clusters. Exposure to the law = 1 if the person was born between 1987 and 1994, it is zero if the year of birth is between 1980 and 1985. The 1986 cohort is excluded as whether those born in 1986 were bound by the reform is uncertain. Regressions also include age, age squared, religious sect dummies, dichotomous ethnicity indicators, region fixed effects as well as dummies for region of birth

*Statistical level at the 10% level; **Significance at the 5% level; ***Significance at the 1% level or better

Table 17 Descriptive statistics of the 2008 sample used in Tables 7, 8, 18, and 19

Variable	Men Ages (23 to 25) in 2008	Women Ages (23 to 25) in 2008	Men Ages (23 to 25) or (27 to 29) in 2008	Women Ages (23 to 25) or (27 to 29) in 2008
Middle school diploma	0.807	0.623	0.769	0.544
	(0.396)	(0.486)	(0.422)	(0.499)
Modern	0.289	0.367	0.270	0.361
	(0.454)	(0.483)	(0.444)	(0.481)
Sunni	0.914	0.911	0.922	0.913
	(0.281)	(0.285)	(0.269)	(0.283)
Alevite Shiite	0.065	0.046	0.061	0.053
	(0.246)	(0.211)	(0.239)	(0.224)
Kurdish or Zaza ethnicity	0.106	0.082	0.104	0.084
	(0.308)	(0.275)	(0.306)	(0.278)
Arabic or other ethnicity	0.055	0.041	0.048	0.028
	(0.228)	(0.199)	(0.215)	(0.165)
Observations	239	245	522	502

Standard deviations are in parentheses

Table 18 The impact of exposure to the placebo treatment on the propensity to have at least 8 years of education—OLS regressions (arrow B in Table 6)

	(1) Males	(2) Females
Exposure to the placebo law	−0.021	−0.106
	(0.055)	(0.084)
	[0.036]	[0.039]
Age	−0.002	−0.039*
	(0.012)	(0.020)
Sunni	−0.086	0.084
	(0.055)	(0.099)
Alevite Shiite	−0.068	0.238**
	(0.085)	(0.083)
Kurdish or Zaza Ethnicity	0.059	−0.148
	(0.041)	(0.118)
Arabic or Other Ethnicity	−0.003	−0.120**
	(0.047)	(0.050)
N	1343	1418

Exposure to the placebo law = 1 if the person was between 23 and 25 years of age in 2008, it is zero if the respondent was between 27 and 29 years of age in 2012 (See Table 6). The entries in parentheses are standard errors of the estimated coefficients, clustered by birth province-age level. Standard errors, which are presented in brackets, are clustered at the birth region by exposure to the placebo law. The 1986 cohort is excluded as exposure to the law depends on the exact day of birth for this cohort. If Kurdish or Zaza Ethnicity = 0 and Arabic and Other Ethnicity = 0, the individual is a Turk. Regressions include region fixed effects as well as dummies for region of birth

*Statistical level at the 10% level; **Significance at the 5% level; ***Significance at the 1% level or better

Table 19 Reduced form estimates of the impact of placebo treatment on modernity and wearing a head cover—OLS regressions (arrow B in Table 6)

Variables	(2) Modern (males)	(3) Modern (females)	(4) Wears head cover
Exposure to the placebo law	−0.070	0.000	0.046
	(0.073)	(0.074)	(0.077)
	[0.043]	[0.049]	[0.044]
Age	−0.012	−0.014	0.012
	(0.019)	(0.017)	(0.018)
Sunni	−0.190*	−0.091	0.167*
	(0.100)	(0.081)	(0.082)
Alevite Shiite	0.136	0.317**	−0.315***
	(0.093)	(0.120)	(0.102)
Kurdish or Zaza Ethnicity	−0.007	−0.054	0.154**
	(0.032)	(0.059)	(0.060)
Arabic or Other Ethnicity	0.038	−0.070	0.054
	(0.069)	(0.049)	(0.055)
N	1330	1403	1420

See notes to Table 18

A Religious “Turban” as worn by an actress in a movie

Photo credit: http://kadinvemadam.blogspot.com/2013/05/selin-demiratar-da-tesetture-girdi.html. May, 2013.

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