

# Does Knowledge Empower?

## Education, Legal Awareness and Intimate Partner Violence

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### **Abstract**

This paper uses an extension of compulsory schooling in Turkey to estimate the causal effects of education on women's legal awareness of laws that were designed to reduce gender inequality and prevent domestic violence. By implementing a regression-discontinuity design, we find that the reform-induced increase in female education improved legal awareness. Women exposed to the reform were more likely to have heard about the new laws and services through newspapers, journals, or books. However, the improvement in women's legal awareness did not translate into significant changes in domestic violence or their ability to quit abusive relationships.

*JEL Classification:* J12, J16, I25

*Keywords:* Legal knowledge, information acquisition, education, domestic violence, regression discontinuity

# 1 Introduction

Intimate partner violence is a worldwide problem with major social, economic, and health consequences. Nearly one out of every three women suffer from physical or sexual intimate partner violence in their lifetimes ([World Health Organization 2013](#)). In developing countries, where women generally have weak bargaining power within the household, such intimate partner violence is even more prevalent.<sup>1</sup> To reduce violence against women, many governments in developing countries have implemented comprehensive legal reforms with the goal of legally empowering women.<sup>2</sup> Some of these reforms entailed not only the introduction of new laws to provide protection, accommodation, and financial support for abused women but also the establishment of new institutions designed to provide legal services to the victims of violence.<sup>3</sup> Such legal reforms have also the potential to change how women interact with the legal system when they experience domestic violence.<sup>4</sup>

Although legislative reform has accelerated in recent decades, multiple barriers still undermine women's access to the justice system.<sup>5</sup> A major one of the barriers has often been perceived as the limited knowledge of women about their rights and of the ways in which laws enforce those rights. A common presumption among development practitioners is that the acquisition of information about new legal reforms is a precondition for

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<sup>1</sup>Abused women are more likely to report physical, mental, and reproductive health problems ([Campbell 2002](#)), and their children are more likely to suffer from socio-emotional and cognitive problems ([Carlson 2000](#); [Huth-Bocks et al. 2001](#); [Aizer 2011](#)).

<sup>2</sup>See [United Nations \(2010\)](#) for an overview of different types of legislation designed and implemented to prevent violence against women across different countries.

<sup>3</sup>Over the past decade, several countries, including Brazil, Ecuador, El Salvador, Mexico, Peru, and Turkey, have launched networks of Violence Prevention Centers, or Women's Justice Centers, which are institutions designed to provide legal, medical, and financial support to victims of domestic violence ([Kavanaugh et al. 2017](#)).

<sup>4</sup>The interaction of domestic violence victims with the legal system has been receiving growing attention in the literature. Recent studies show that having more female police officers significantly improve the quality of policing provision, and improve reporting of crime against women ([Amaral et al. 2018](#); [Amaral 2019](#)).

<sup>5</sup>[Friedemann-Sánchez \(2012\)](#), using evidence from Colombia, highlights that the main barrier to the assertion of legal rights in developing countries is often a lack of legal awareness and understanding of a person's rights.

improving women's access to the justice system, and increasing their bargaining power within the household. Indeed, building inclusive justice systems was recently included among the Sustainable Development Goals of the United Nations to ensure gender equality ([United Nations 2017](#)).<sup>6</sup> However, to this date, there is no causal evidence to support this hypothesis in the existing literature.

In this paper, we examine whether increasing women's educational attainment improves legal awareness of laws designed to prevent domestic violence. Ultimately, however, knowledge is a means to an end. We, therefore, also assess whether such knowledge acquisition has consequences for related outcomes, including the ability to quit an abusive relationship and the risk of experiencing domestic violence. Improved female education may enhance the ability to access and process new information on recently introduced laws and services. In turn, the improvement in legal awareness may increase women's bargaining power within the household and reduce their exposure to intimate partner violence. To the best of our knowledge, our study provides the first causal evidence on the impact of education on legal knowledge and its consequences for domestic violence.<sup>7</sup>

Since the early 2000s, Turkey has made substantial changes in laws pertaining to gender equality and prevention of domestic violence. These changes were partly motivated by the process of Turkey's negotiations on accession to the European Union (EU) ([Aldikacti-Marshall 2008](#)). For example, in 2004 the penal code recognized sexual violence against women as a criminal act against an individual and extended the definition of rape to include rape within marriage. In 2012, the Turkish parliament introduced the Law to Protect Family and Prevent Violence against Women, which improved the protection of victims against renewed violence from the perpetrators by improving the capabilities of police to

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<sup>6</sup>The need to provide legal literacy programs was also recognized in the Beijing Platform for Action in 1995 organized by the United Nations.

<sup>7</sup>The scope of legal knowledge (e.g., whether individuals know their legal rights and obligations) differs from political knowledge (e.g., whether individuals follow politics in media or participate in political parties) and civic knowledge (e.g., whether individuals are aware of their civil rights and duties). [Dee \(2004\)](#) examines the effects of education on civic awareness and engagement, and [Milligan et al. \(2004\)](#) examines the effects of education on political awareness and interest, as we explain in greater detail below.

take effective action. In addition, it regulated the establishment of Violence Prevention and Supervision Centers (VPSCs) to provide legal and financial support and new shelters to accommodate women and children experiencing domestic violence.<sup>8</sup>

We refer to these recent changes in the gender-equality legislation as “new” laws and services to distinguish them from pre-existing laws and services that date back to the 1920s.<sup>9</sup> We exploit the rollout of the 1997 Basic Education Program in Turkey, which increased compulsory school attendance from five to eight years, to study the impact of increased exposure to education on women’s awareness of these legal reforms and domestic violence outcomes. We employ the 2014 National Survey on Domestic Violence against Women in Turkey ([NSDVW 2014](#)), which includes information on women’s legal knowledge as well as different forms of intimate partner violence. Our dataset is novel in its coverage of both indicators of women’s legal knowledge on specific topics and the particular outcomes that legal reforms were intended to regulate.

Since unobservable characteristics such as ability, socioeconomic status, and upbringing may affect both education and legal knowledge, simple correlations that do not account for reverse causality or omitted variable bias may be misleading. To isolate the causal impact of education on legal knowledge in the Turkish context, we employ a regression-discontinuity (RD) design that allows us to estimate a meaningful treatment effect by comparing legal awareness indicators for younger women exposed to the reform and older women who were not exposed to it. As the required age for beginning junior high school in Turkey is 12, the extension of compulsory schooling in 1997 implied that individuals born after January 1987 were required to complete eight years of education while older cohorts born before January 1987 could drop out after five years ([Cesur and Mocan 2014](#); [Dincer et al. 2014](#)). Our identifying assumption is that these two cohorts, born one month

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<sup>8</sup>Section 2.2 provides further details of the legislation on gender equality and domestic violence in Turkey.

<sup>9</sup>This classification is useful in distinguishing post-2000 laws that were passed during the EU negotiations to fulfill the accession criteria on gender equality from the pre-2000 laws that have largely been in place since the 1920s. The post-2000 laws have provided a much stronger legal framework to prevent intimate partner abuse and protect women’s rights in marriage, work, and other social relations, as we explain in detail in Section 2.2.

apart, exhibit no systematic differences other than whether they were exposed to the education reform.

We find that the reform induced an average increase of roughly one year of additional schooling for women. Our main finding suggests that the reform-induced increase in female schooling improved women's legal awareness of new laws and services designed to reduce gender inequalities and prevent domestic violence. Moreover, we find no evidence of a significant impact of the education reform on women's knowledge about pre-existing laws, dating back to 1920s, related to gender equality and domestic violence. These findings imply that having additional years of schooling provides women with an advantage in acquiring new information about recently introduced laws and services, while almost a century-old pre-existing laws are more likely to be common knowledge by 2014. We also find that the reform had a significant impact on the source from which women acquired information about new laws and services. In particular, we find that the reform had a positive impact on having heard about the new laws and services through newspapers, journals, or books. In contrast, we find no significant effect of the reform on other sources of information, including TV, family and friends, and formal institutions.

Despite the substantial improvement in legal awareness of women about laws and services concerning gender equality and domestic violence, we find no evidence indicating that the reform had a significant impact on domestic violence measures or divorce-related outcomes. In particular, we find no evidence of a significant effect on physical violence, sexual violence, psychological violence, or financial control behavior exercised by intimate partners. We also find no evidence that the reform had a significant impact on ever leaving home after experiencing domestic violence, ever getting divorced, or having a second marriage.<sup>10</sup>

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<sup>10</sup>We note upfront that our analysis of the divorce and remarriage outcomes using the data from the NSD VW of 2014 has potential shortcomings. The Law to Protect Family and Prevent Violence against Women in Turkey was introduced in 2012. Although two years is a long enough period to hear about the new laws, this legal knowledge may not translate into changes in actual marriage market outcomes in such a short time span if making a major life-decision such as leaving a partner or remarrying require certain things to be settled and/or if divorce procedures take longer. It is possible that significant changes would be found

One possible threat to our identification strategy might arise from the use of self-reported data on domestic violence outcomes and legal awareness. If more-educated women are more or less likely to report violent episodes or their knowledge of laws and services, the results might suffer from reporting bias.<sup>11</sup> Although we cannot rule out this possibility, any such bias is likely to be limited in this context for two reasons. First, we find no evidence that female education had a significant impact on women's gender attitudes, as shown in Table A2. In particular, we find no evidence that additional years of schooling had a significant impact on women's likelihood of reporting that they approve of intimate partner violence in certain situations. Second, the subject of legal awareness is not a socially stigmatized issue, unlike domestic violence or other more sensitive topics. As such, any social desirability bias attributable to reporting legal awareness is likely to be minimal.<sup>12</sup>

Our study is related to several strands of existing literature. First, our work contributes to the prior research that has explored the relationships between education and political knowledge, civic understanding, and engagement. [Dee \(2004\)](#) finds that education has a significant effect on both voting behavior and civic awareness in the United States. Similarly, [Milligan et al. \(2004\)](#) show that higher education predicts higher political awareness and interest by exploiting compulsory schooling laws in the United States and the United Kingdom. In a recent study exploring similar questions in a developing country context, [Friedman et al. \(2016\)](#) find that an increase in female schooling in Kenya led to an in-

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in the marriage market outcomes in response to the new laws and the increased knowledge about them in the longer-term.

<sup>11</sup>It is important to note that it would be ideal to use administrative data from hospital or police reports on domestic violence given that they are objective measures of violence. However, this kind of information is likely to be misleading, especially in a developing country setting where only a selected group of women has access to hospitals or police stations after experiencing a violent episode. For example, in our dataset, only 6.5% of all women who faced physical violence visited a hospital after the assault, and only 9.8% of them filed a police report. It is also not possible to capture the degree of psychological or financial violence using administrative reports.

<sup>12</sup>It is also important to note that there is no administrative data that can be used to analyze this problem. Any administrative data collection on legal knowledge will necessarily have to question individuals about whether they have heard about a certain law or service, and such self-reporting might also suffer from bias in the same way as self-reporting in survey data collection.

crease in political knowledge and reduced acceptance of political authority among young women.

Our work is also closely related to the earlier studies suggesting a causal relationship between education and individuals' acquisition of new information, as well as their ability to actively exploit this new information to their own benefit. The most notable line of this body of work investigates the relationship between education and health outcomes. [Lleras-Muney and Lichtenberg \(2002\)](#) propose that more-educated people have better health outcomes as a result of being more willing and able to use newer health technologies. Similarly, [Glied and Lleras-Muney \(2008\)](#) show that more-educated people have better chances of survival in case of diseases with more technological progress in treatment. However, [Cutler and Lleras-Muney \(2006\)](#) underline an important fact: better ability to reach or process knowledge does not always translate into action. Thus, education does not always guarantee necessary changes in actual health behavior. Our findings are in line with those of the education-health literature: while education plays an important role in improving legal knowledge, a first step toward raising awareness of women's rights, it may not be enough to change the overall well-being of women if knowledge cannot guarantee access to legal institutions.

Our paper is also related to the extended literature on the causal effects of compulsory schooling laws on returns to education in the labor market ([Angrist and Krueger 1991](#); [Oreopolous 2006](#)), health outcomes ([Lleras-Muney 2005](#); [Clark and Royer 2013](#)), fertility behavior ([Black et al. 2008](#); [McCrary and Royer 2011](#)) and other outcomes. Previous studies examined the effects of the same 1997 compulsory schooling reform on other outcomes of interest in Turkey. These studies include, but are not limited to, [Cesur and Mocan \(2014\)](#) and [Gulesci and Meyersson \(2012\)](#), who find a negative effect of the reform on women's religiosity; [Dincer et al. \(2014\)](#) and [Gunes \(2016\)](#), who find a negative effect on fertility and child mortality; [Erten and Keskin \(2018\)](#), who find an increase in the psychological violence; and [Erten and Keskin \(2019\)](#), who find a decline in intergenerational transmission

of violence against children. Although our findings complement these studies, our paper differs significantly through its focus on legal knowledge and its relation to domestic violence outcomes.

Finally, our paper contributes to the growing literature on the causes and consequences of intimate partner violence.<sup>13</sup> The focus on this literature ranges from the role of external environment on the formation of domestic violence attitudes ([Pollak 2004](#); [La Mattina 2017](#); [La Mattina and Shemyakina 2019](#); [McCarthy 2019](#)), to the effects of economic empowerment of women on their experience of domestic violence ([Angelucci 2008](#); [Aizer 2010](#); [Bobonis et al. 2013](#); [Heath 2014](#); [Cools and Kotsadam 2017](#); [Erten and Keskin 2018](#)), and to the impact of institutional changes such as divorce laws on domestic violence outcomes ([Stevenson and Wolfers 2006](#); [Garcia-Ramos 2019](#)). Our study contributes to this literature by focusing on effects of increased female education on awareness about and utilization of institutional changes aimed at supporting and empowering victims of violence.

This paper is organized as follows. Section 2 provides a brief description of the 1997 compulsory schooling law in Turkey and the laws on gender equality and domestic violence prevention in the country. Section 3 presents the data used for the analysis, as well as the identification strategy and preliminary checks for the RD analysis. Section 4 presents the findings, and Section 5 concludes the paper.

## 2 The Context

### 2.1 The Compulsory Schooling Reform in Turkey

We study the consequences of the compulsory schooling reform that took place in Turkey in 1997. Prior to the reform, the Turkish education system consisted of five years of primary school, three years of junior high school, and three years of high school. Only the first five years of primary school education were compulsory, and the two higher levels

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<sup>13</sup>See, for example, [Strenio \(2019\)](#) for a review of this literature.



were voluntary. In 1997, the Turkish parliament introduced Law No. 4306, which extended compulsory schooling to eight years, merging primary and junior high school into primary education. The law effectively eliminated the option to attend religious junior high schools and replaced the primary school diploma awarded at the end of fifth grade with a primary education diploma received upon successful completion of the eighth grade.<sup>14</sup> Passed on August 16, 1997, the law was referred to as the Basic Education Program, and it applied to all students who did not already have a primary school diploma at the beginning of the 1997-1998 school year.

According to the Turkish law on school starting age, a child begins compulsory schooling in September of the year when he/she turns six years old. The 1997 Basic Education Program, which made eight years of primary education compulsory, was effectively implemented in the 1997-1998 school year. This implied that students who had completed the fifth grade in 1997 could drop out, while those who had completed fourth grade in 1997 were required to continue school through eighth grade. The combination of the school starting age law and the 1997 Basic Education Program implied that children born before January 1987 could drop out after five years, whereas those born after January 1987 had to complete eight years of education. Although there may have been cases that do not strictly fit this rule, due to either imperfect compliance with the age of starting school or grade repetition, the official requirements were such that students born after January 1987 were more likely to comply with the new compulsory schooling law than were older cohorts.<sup>15</sup> The introduction of the 1997 Basic Education Program allows us to isolate the effect of compulsory schooling from other policy changes that may have taken place during this period since one has no reason to expect other policy changes to differentially affect indi-

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<sup>14</sup>The compulsory education reform was motivated largely by the political events of the late 1990s, as it was introduced to limit the spread of Islamist political movements during that time. See [Erten and Keskin \(2018\)](#) for details of the political events that culminated in the adoption of the reform.

<sup>15</sup>See [Cesur and Mocan \(2014\)](#) for details of the laws, which stipulated that Turkish students who were 72 months old by the end of a calendar year could start school in September of that year (Resmi Gazete, Number 21308). As a result, children born before January 1987 could begin primary school education in 1992 and unintentionally avoid the 8-year requirement that was adopted on August 18, 1997, and effectively implemented in the 1997-1998 school year.

viduals born before or after January 1987.

The Basic Education Program required massive investments in schooling infrastructure, which increased the share of education in the public investment budget from 15 percent in 1997 to 37 percent in 1998. Referred to as a ‘big bang’ approach to education reform, the program entailed the restoration of old schools and the construction of new schools, the hiring of 103,000 additional teachers (a 41 percent increase) and the construction of 80,000 new classrooms (a 36 percent increase) between 1996 and 2003. The Turkish government also sought to improve computer literacy by distributing more than 56,000 computers to rural primary schools. A standardized bus system was implemented in 2000 to transport students from rural areas to nearby schools, and a program was established to distribute free books and meals to low-income students. Overall, the Basic Education Program successfully increased enrollment in primary education. The net schooling ratio rose from 84.74 percent in 1997 to 93.54 percent in 2000. The enrollment of girls increased substantially, and the ratio of girls to boys in primary and secondary education rose from 90 percent in 1995 to 97 percent in 2005.

## **2.2 Overview of the Laws on Gender Equality and Domestic Violence in Turkey**

### **2.2.1 The Laws on Gender Equality and Domestic Violence prior to the 2000s**

Turkey was founded shortly after World War I (in 1923) and adopted the Swiss civil code in 1926. The civil code replaced Islamic law, which had been in place during the Ottoman Empire. A wide range of gender inequalities that were tolerated under Islamic law were abolished. It became illegal for a man to marry more than one woman. Marriage was defined in secular terms, and it became illegal to have a religious marriage before having an official government-authorized marriage. The unequal share of inheritance for women and unilateral divorce for men were eliminated. The rights of women regarding custody

of children were expanded (Arat 2010; Uluhan 2002). The legal age of marriage was raised to 17. However, parents and other relatives who had custody of children could give permission for their children to get married after the age of 15. Any marriages before the age of 15 were declared illegal and punishable by imprisonment. While several proposals were made to amend the civil code in the 1970s and early 1980s, particularly the articles that recognized the husband as the head of the household and the wife largely as a dependent, these proposals failed to become law under the governments in power during this period (Arat 2010).

The political movement for achieving gender equality in Turkey began to gain momentum in the 1980s and demanded that the government take action against violence against women. In 1986, Turkey signed the United Nations' Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW). This led to the establishment of the Consultative Board of Policies for Women within the State Planning Organization in 1987 and the Directorate General of Status and Problems of Women in 1990 as key institutions for designing policies to address gender inequality and domestic violence in Turkey (Yuksel-Kaptanoglu and Tarim 2015).

The first major law introduced to combat violence against women in Turkey was Law No. 4320, the Law to Protect the Family, which was enacted in 1998. The law consisted of two main articles. The first stated that a perpetrator of violence is forbidden to approach or contact the victims of that violence. This included that the perpetrator was required to leave the residence shared with the spouse or children if such a residence exists or that he shall not approach the residence occupied by the spouse and children or their work place. The second article asserted that the victim is provided temporary protection service by the police, particularly if there is evidence that the victim's life might be in danger. The law further stated that the protection order is entrusted to the Public Prosecutor by the court.<sup>16</sup> One limitation of the law highlighted by critics is that it only applied to married women

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<sup>16</sup>Resmi Gazete; Saturday, January 17, 1998.

because its ultimate aim was to protect family relations. Divorced victims of violence, or victims of violence prior to marriage, could not take advantage of the law.

### **2.2.2 The Laws on Gender Equality and Domestic Violence after the 2000s**

Since the early 2000s, Turkey has made substantial changes in laws pertaining to gender equality. Part of the motivation to introduce these changes originated from Turkey's negotiations on accession to the EU ([Aldikacti-Marshall 2008](#)). The European Commission has included gender equality as a human right within the broader category of political criteria that need to be fulfilled as a conditionality by candidate states to be considered for EU membership. The Turkish government sought to accelerate the membership process by making several amendments to Turkey's civil code, penal code, and labor law, as well as its constitution. Women's NGOs were also actively involved in voicing their concerns through signed petitions, press releases, and visits to members of parliament during the amendment process.

The Turkish parliament introduced major changes to the civil code on November 22, 2001. The legal age for marriage was raised to 18 for both sexes. The provision stating that the husband was the head of the family was eliminated, which implies that the wife has gained the legal right to participate in intrahousehold decisions, including the schooling decisions for children, residential choice decisions, and decisions to acquire assets. One of the major amendments to the civil code was that after divorce women, are now entitled to receive half of the assets obtained by the couple during marriage ([Aldikacti-Marshall 2008](#)). Previously, each spouse received the assets to which he/she had ownership rights. Given that most assets were owned by men, as fewer than one-third of women earn income in Turkey, previously divorced women had no rights to assets obtained during marriage. This amendment ensured that spouses equally share the assets acquired during marriage. Another major amendment to the civil code was the elimination of the provision that requires married women to have their husband's permission to work outside the

home ([Uluslan 2002](#)). Furthermore, the parliament also amended the labor law in 2003 to comply with EU directives on providing gender equality at work. Pregnant women were provided with the right to take 16 weeks of paid maternity leave and an additional six months of unpaid leave after delivery.

The reforms to the civil code and labor law were followed by significant amendments to the penal code, which were adopted on September 26, 2004 and took effect on June 1, 2005. The sexual violence against women was included within the category of “crimes against an individual” instead of “crimes against society”. Article 102 of the penal code extended the definition of rape to include rape within marriage and punished the latter with seven to 12 years in prison. The code also prevents any way of avoiding legal ramifications of rape by way of marriage. Previously, a male rapist would receive little or no punishment if he agreed to marry the victim. The revised code eliminated this option. Women were also given the right to abort a pregnancy up to 20 weeks if it had occurred due to rape. Article 105 of the penal code stipulates penalties for sexual harassment in the workplace against co-workers. Finally, Article 82 addressed the issue of honor killings by ruling that any murder case justified by traditions and customs would be penalized by life imprisonment ([Aldikacti-Marshall 2008](#)).

The constitution was also amended to state the principle of equality between men and women in several articles. Article 10, which asserts that everyone is equal under the law regardless of their language, race, color, sex, political opinion, philosophical stance, or religion, was revised in 2005 to include the following: “Women and men have equal rights and the state has the responsibility to ensure the implementation of these rights.” Article 41, stating that “the family is the basis of Turkish society,” was amended in 2001 to include that “family is based on equality among partners.”

The enforcement of Law No. 4320, the Law to Protect the Family, had been rather limited until the establishment of family courts in 2003 and the publication of a public mandate by the Department of Justice to effectively enforce the law in 2006 ([Yuksel-Kaptanoglu](#)

and Tarim 2015). These latter changes were again part of the reforms introduced to follow EU directives on gender equality in the 2000s. A major impetus in the struggle against domestic violence was provided by the Council of Europe Convention on Preventing and Combating Violence against Women and Domestic Violence, also known as the Istanbul Convention, which was held in 2011 and became binding in 2012. The Istanbul Convention redefined domestic violence to include not only physical violence but also sexual, psychological, and financial dimensions of violence and controlling behavior. It also formed a Group of Experts on Action against Violence against Women and Domestic Violence (GREVIO), which has published reports about states regarding whether they are fulfilling their commitments under the Istanbul Convention and acts as a mechanism of supervision under international law.

The Turkish parliament passed Law No. 6284, the Law to Protect Family and Prevent Violence against Women, on March 8, 2012. The law was designed to comply with the provisions of Istanbul Convention and improve the implementation of Law No. 4320. Unlike the previous law, Law No. 6284 covers all women, regardless of their marital status. One of the distinguishing features of the law is its focus on the protection of victims against renewed violence by the perpetrators. The law authorizes police officers to issue a protection order as soon as the victim needs protection. Previously, the police could not take protective measures in the absence of reports from a family court or the public prosecutor. The law also brought increased penalties by stating that the perpetrators who violate a protection order will immediately be subject to three days of imprisonment.<sup>17</sup>

Another important article of Law No. 6284, Article 14, proposes the establishment of VPSCs. These institutions, established as a pilot in 14 cities, are intended to centrally direct resources to combat violence against women by working in tandem with the Department of Family and Social Policies. The new law also stipulates that the state provide shelters as accommodations for those who experience domestic violence and their children. In ad-

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<sup>17</sup>Resmi Gazete; Tuesday, March 20, 2012.

dition, Municipality Law No. 6360 passed in 2012 asserts that every metropolitan municipality and municipalities with populations greater than 100,000 are required to establish shelters for women and children (Yuksel-Kaptanoglu and Tarim 2015). The VPSCs have been working in close cooperation with the newly established shelters. Moreover, Law No. 6284 states that a victim of violence be provided with childcare services, covering four months of day care, or a maximum two months for those who have a job, to support the woman’s integration into work life. The new law also provides temporary financial support to the victims of violence, amounting to half of the net minimum wage.<sup>18</sup> Furthermore, the new law prevents the perpetrator from selling any shared home.<sup>19</sup> Finally, the new law provides diagnosis and treatment services to the perpetrator of violence if he is addicted to alcohol or drugs.

### 3 Data and Empirical Methodology

#### 3.1 Data

We use data from Turkey’s National Survey on Domestic Violence against Women (NS-DVW) of 2014. This survey is a nationally representative household survey, containing information on the respondents’ experiences of domestic violence, their educational background and demographics, and their knowledge about laws and services designed for the victims of domestic violence, as well as their sources of information about these laws and services. One of the main objectives of the survey was “to identify problematic areas regarding the legal regulations for combating violence (especially problems regarding the implementation of the Law No. 6284 on the Protection of the Family and the Prevention of Violence against Women)” (Yuksel-Kaptanoglu and Tarim 2015). Hence, to assess the

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<sup>18</sup>Resmi Gazete; Tuesday, March 20, 2012.

<sup>19</sup>Even if the shared home is owned by the abuser, the family court can notify the land registration office that the house is shared by the family, in which case the abuser can no longer sell the house as long as the victim is opposed to the sale.

effectiveness of laws designed to prevent domestic violence, the survey contained specific questions about women's legal awareness and the sources of information through which they gained such awareness. This survey on domestic violence is novel in terms of containing information on not only women's experiences of intimate partner violence but also their awareness of laws designed to prevent the recurrence of such violence.

The survey was conducted among 15,072 households between April and July 2014. The survey covered women between 15 and 59 years of age, and one woman per household was randomly selected for the interview. Special effort was made to avoid having anyone else in the room while the interviews were conducted. The respondents were informed that their answers would be kept strictly confidential. The survey also includes the birth month and year of each respondent, which allow us to use an RD approach.

Table 1 reports summary statistics on the major indicators of women from the 2014 NSDVW survey. We provide summary statistics for women between the ages of 17 and 37 because the estimated bandwidths in our local regression analyses fall into this range. Panel A indicates that the average years of schooling for this age group was 8.3. Approximately 58 percent of women had completed junior high school, 36 percent had completed high school, and 92 percent had completed primary school. These figures are consistent with the overall pattern in Turkey, where female educational attainment remains rather low.<sup>20</sup>

The laws and services concerning gender equality and the prevention of domestic violence can be categorized into two groups: (a) the pre-existing laws and services that date back to the foundation of Turkey and (b) the new laws and services that were introduced after the 2000s during Turkey's negotiations for EU membership. Section 2 provides detailed information on the several amendments introduced in these laws and the socio-political context during their introduction. Panel B of Table 1 presents descriptive statistics for women's information about the pre-existing laws and services. In particular, the

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<sup>20</sup>In our entire survey dataset, the female junior high school completion rate is 44 percent, the female high school completion rate is 27 percent, and the female primary school completion rate is 88 percent.



respondents were asked whether they had heard about these laws and services. A large majority of women reported that they had heard about the legal rules about marriage that have been in place for over eight decades. Moreover, 87 percent of women had heard the legal rule that men and women have to be at least 17 years old to get married. Similarly, 93 percent of women had heard that it is illegal for parents and other relatives to have their children below the age of 15 married and that such parents would be penalized by prison time. Moreover, 83 percent of women had heard that it is illegal to have a religious marriage before an official one, and 84 percent were aware that the practice of polygamy is illegal. A large proportion of women also reported that they had heard about the provisions of the earlier law designed to reduce domestic violence. In particular, 88 percent were aware of the legal rule that the perpetrator of violence is kept away from the common residence to protect the victims, and 78 percent had heard about the provision that the perpetrator is prevented from approaching or contacting the protected victims of violence in a broader sense. Similarly, 86 percent of women were aware that the victim is provided temporary protection services, particularly when her life is in danger.

Panel C of Table 1 provides summary statistics of women's information about new laws and services related to gender equality and the prevention of domestic violence. Approximately 70 percent of women reported that they were aware of the legal rule introduced in the 2005 Penal Code making it illegal for a man to have sex with his wife without her consent. A much lower proportion of women – 42 percent – reported that they had heard about the amendment in the 2001 Civil Code stating that a woman is not required to have her husband's permission to work outside the home. However, a large share of women – 91 percent – were aware of another amendment of the same civil code, which asserts that spouses share the property that they obtained during their marriage if they get divorced. The overall awareness of legal rules introduced in the 2012 Law to Protect the Family and Prevent Domestic Violence tend to lower, on average, but it varies largely by indicator. For example, while 86 percent of women reported that they had heard about the legal rule

that shelters are provided for people who have experienced domestic violence and for their children, only 38 percent were aware of the provision that the victim of violence is provided with childcare services. Similarly, 48 percent were aware that victims of violence are provided temporary financial support, and 41 percent had heard that the perpetrator is prevented from selling the shared home. Moreover, 59 percent were aware that if the perpetrator has alcohol addiction or a drug abuse problem, he is provided with diagnosis and treatment opportunities. Furthermore, a mere 12 percent had heard about one of the most distinguishing features of the 2012 Law, which stated that services are provided to the victims of violence by the VPSCs.<sup>21</sup>

Following [Duflo et al. \(2007\)](#) and [Kling et al. \(2007\)](#), we aggregate information from different indicators of legal knowledge to create two indices of awareness related to pre-existing and new laws and services. This aggregation provides greater statistical power to identify effects in the same direction for a group of indicators that captures similar forms of information. We construct these indices by averaging the z-scores of the underlying measures of information.<sup>22</sup> Higher index values indicate higher levels of legal awareness.

Panel D of [Table 1](#) reports summary statistics on the sources of information about new laws and services. The respondents were asked from which source of information they

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<sup>21</sup>Section 2 provides detailed information about these new laws and services introduced in the post-2000 period.

<sup>22</sup>The awareness of pre-existing laws index is a z-score calculated by averaging the z-scores of the seven information indicators, based on dummy variables that take value one if the respondent reports that she has heard about the following pre-existing laws and services: (i) men and women have to be at least 17 years old to get married; (ii) it is illegal for parents and other relatives to have their children below age 15 married and that doing so is punishable by imprisonment; (iii) it is illegal to have a religious marriage before an official marriage; (iv) it is illegal for a man to marry more than one woman; (v) the perpetrator is kept away from the common residence to protect the victims of violence; (vi) the perpetrator is prevented from approaching or contacting the protected victims of violence; and (vii) if the victim's life is in danger, the victim is provided temporary protection services. The awareness of new laws index is a z-score calculated by averaging the z-scores from each of the nine information indicators, based on dummy variables that take value one if the respondent reports that she has heard about the following new laws and services: (i) it is illegal for a man to have sex with his wife without her consent; (ii) a woman is not required to have her husband's permission to work outside the home; (iii) after spouses get divorced, they share the property that they obtained during their marriage; (iv) shelters are provided for people who have experienced domestic violence and their children; (v) if the perpetrator is addicted to alcohol or drugs, he is provided with diagnosis and treatment opportunities; (vi) the victim of violence is provided with childcare services; (vii) services are provided to victims of violence by the VPSCs; (viii) the victims of violence are provided temporary financial support; and (ix) the perpetrator is prevented from selling the shared home.

had heard about the new laws and services. Using the indicators on sources of information, we construct four summary indices capturing whether the respondent had heard about the new laws and services from (i) TV, (ii) newspapers, journals, or books, (iii) friends and family (social networks), and (iv) formal institutions (including both public and non-governmental institutions).<sup>23</sup> Higher values of the indices indicate higher levels of awareness obtained from a particular source of information.

Finally, Panel E of Table 1 provides descriptive statistics on domestic violence and divorce-related outcomes. Using different sets of domestic violence measures, we create four summary indices from the averages of z-scores of indicators in each dimension: a physical violence index, a sexual violence index, a psychological violence index, and a financial control index.<sup>24</sup> Higher index values indicate higher levels of domestic violence.

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<sup>23</sup>The heard about new laws from TV index is a z-score calculated by averaging the z-scores of two information indicators, including a dummy variable that takes value one if the respondent reports that she heard about the new laws from TV and a dummy variable that takes value one if the respondent reports that she heard about the new services from TV. The heard about new laws from newspapers, journals, or books index is a z-score calculated by averaging the z-scores of two information indicators, including a dummy variable that takes value one if the respondent reports that she heard about the new laws from newspapers, journals, or books and a dummy variable that takes value one if the respondent reports that she heard about the new services from newspapers, journals, or books. The heard about new laws from friends and family (social networks) index is a z-score calculated by averaging the z-scores of two information indicators, including a dummy variable that takes value one if the respondent reports that she heard about the new laws from friends and family and a dummy variable that takes value one if the respondent reports that she heard about the new services from friends and family. The heard about new laws from formal institutions index is a z-score calculated by averaging the z-scores of six information indicators, based on dummy variables that take value one if the respondent reports that she heard about the new laws from public institutions, schools, or non-governmental institutions and dummy variables that take value one if the respondent reports that she heard about the new services from public institutions, schools, or non-governmental institutions.

<sup>24</sup>The physical violence index is a z-score calculated by averaging the z-scores of each of the six physical violence indicators, based on dummy variables that take value one if the respondent reports that she experienced intimate partner violence acts in the form of (i) slapping or throwing an object that would hurt; (ii) pushing, shoving, or pulling hair; (iii) hitting with his fist or in a way that hurts; (iv) kicking, pushing to the ground, or beating; and (v) choking or burning. The sexual violence index is a z-score constructed by averaging the z-scores of each of the three sexual violence indicators, based on dummy variables that take value one if the respondent reports that she experienced intimate partner violence in the form of (i) forced sexual acts, (ii) forced sexual relations done out of fear of what the partner would do otherwise, and (iii) humiliating sexual acts. The psychological violence index is a z-score calculated by averaging the z-scores of each of the following indicators, based on dummy variables that take value one if the respondent reports that she experienced intimate partner violence acts of (i) insulting, (ii) humiliating, (iii) scaring or threatening, (iv) attempting to isolate her from her friends, (v) attempting to prevent contact with her family, (vi) insisting on knowing her location, (vii) ignoring her, (viii) becoming angry if she speaks to other men, (ix) suspecting that she is cheating on him, (x) wanting her to seek his permission before obtaining healthcare, and (xi) intervening in her clothing choices. The financial control index is a z-score constructed by averaging the z-scores of two of the financial control behaviors, including dummy variables that take value one if the respondent reports that she experienced the following behaviors from her intimate partner: (i) taking income from her despite her disapproval and (ii) refusing to give her money for household spending.

Panel E also indicates that 34 percent of women who experienced physical violence from their partners have left home at least once. However, only five percent of women have ever divorced, and two percent of them have had a second marriage.

### 3.2 Identification

The combination of the 1997 compulsory schooling law and the law on school starting age implies that individuals born after January 1987 were required to complete eight years of schooling, whereas those born earlier could drop out after five years, as explained in greater detail earlier in Section 2.1. We exploit this discontinuity in an RD design to estimate the causal effect of education on awareness of new laws and services pertaining to gender equality and the prevention of domestic violence. Our identifying assumption is that these two cohorts born one month apart do not exhibit any systematic differences other than being exposed to the compulsory schooling law or not. As long as this assumption holds, this approach represents a treatment assignment that is as good as random. In our RD design, we assign treatment based on an individual’s month and year of birth, implying that those born after January 1987 are assigned to treated status.

We employ an RD design by exploiting discontinuity in the birth date and using this discontinuity as an instrument for years of schooling, following previous research (Oreopolous 2006; Clark and Royer 2013). We report both reduced-form (RF) estimates (i.e., sharp RD) and two-stage least-squares estimates (i.e., fuzzy RD) for all of the outcome variables of interest. Our specification follows a basic RD form:

$$y_i = \alpha + \beta t_i + f(x_i) + \epsilon_i \tag{1}$$

$$\forall x_i \in (c - h, c + h)$$

where  $y_i$  is the dependent variable,  $t_i$  is the treatment status,  $x_i$  is the forcing variable, and  $h$  is the bandwidth around the cutoff point  $c$ . We allow the slope to vary on each side of

the cutoff. The control function,  $f(x_i)$ , is a continuous  $n$ -order polynomial function of the forcing variable on each side of the cutoff point. We use local linear regressions in our RD estimations (Imbens and Lemiux 2008) and conduct optimal bandwidth selection using the Imbens and Kalyanaraman (2009) procedure. This approach implies the selection of an optimal bandwidth for each outcome variable examined.<sup>25</sup> Following Lee and Card (2008), we cluster standard errors at the month-year-of-birth level to accommodate specification error in the forcing variable.

In all of our specifications, we include the following control variables: a dummy variable for whether the respondent grew up in a rural location, a dummy variable for whether the respondent's mother tongue is not Turkish, month-of-birth fixed effects, childhood-region fixed effects, and interactions of childhood-region fixed effects with an indicator for rural childhood regions.<sup>26</sup>

### 3.3 Preliminary Checks

We test the validity of our RD design by using two standard checks (Imbens and Lemiux 2008). First, we examine whether the density of the forcing variable, the month-year of birth, is continuous at the discontinuity. We perform a McCrary density test on the density of the forcing variable. This test yields an insignificant estimate, as shown in Figure 1.

Second, we investigate whether the predetermined covariates are balanced around the discontinuity. In Figure 2, each graph illustrates local averages of the outcome in one-month bins plotted against the forcing variable, with overlaid linear regression lines using raw data on each side of the threshold. The gray lines represent 95 percent confidence intervals. The predetermined characteristics include regional dummy variables capturing whether the respondent's childhood region is western, southern, central, northern, or east-

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<sup>25</sup>In addition, we use specifications that adopt the optimal bandwidth from the first-stage results for junior high school completion, which is estimated as 118 months around the discontinuity; these are included in the appendix tables. This static bandwidth approach complements the former results for which we use the optimal bandwidth.

<sup>26</sup>We use fixed effects for 12 regions where the respondents lived until the age of 12, when they were subjected to the education reform.

ern Turkey and whether the respondent’s interview language is not Turkish. The graphs do not indicate any significant jumps at the cutoff point. We also report regression-based tests of whether the control variables exhibit any significant jumps at the discontinuity. In Online Appendix B, Table A1 shows that the control variables do not exhibit any evidence of a statistically significant jump at the discontinuity, with the exception of one childhood region. A SUR test of the coefficients’ joint significance results in a p-value of 0.29. Overall, we conclude that the predetermined covariates appear to be balanced around the discontinuity.

Because all of the domestic violence-related questions are relevant only to women who have been in a relationship, our RD analysis for these outcomes is based on the sample of women who have had a relationship. One concern is the extent to which the treatment had an effect on relationship status and, therefore, on selection into the sample of analysis. To address this concern, we examine whether the reform had a significant effect on ever having a relationship or on ever being married. Figure 3 plots local averages of these outcomes in monthly bins against the forcing variable. The overlaid linear regression lines show no evidence of a significant jump around the discontinuity. In Online Appendix B, Table A1 indicates no evidence of a significant effect of the reform on relationship status. The estimated coefficients are also null. Hence, there is no reason to expect that the reform affected the probability of selection into the sample of women who have had a relationship or were ever married.

## **4 Effects of the Compulsory Schooling Law**

### **4.1 Schooling Outcomes**

We proceed by testing the effect of the compulsory schooling law on schooling outcomes. Figure 4 provides a graphical illustration of the RD design by comparing the treatment and placebo effects using the 2014 and 2008 NSDVW surveys. The left-hand graph plots

the female junior high school completion rates in monthly bins against the month and year of birth, with a threshold of January 1987, using the 2014 NSDVW survey. As explained in detail in Section 2.1, the education reform required those born after this date to complete junior high school, while the older cohorts had the option of dropping out after completing primary school. The left-hand graph shows a clear jump at the discontinuity, with an approximately 15-20 ppt increase in the probability of completing junior high school. Using data from the 2008 NSDVW, we conduct a placebo test to examine the validity of the RD design. The right-hand graph of Figure 4 shows the same relationship using the 2008 HLFS survey with the same age cutoff, comparing 27- and 28-year-old women. The age cutoff corresponds to being born before or after January 1981. The right-hand graph shows no evidence of a break in completing junior high school for women of the same age in the 2008 NSDVW data. Thus, the jump that we observe around the discontinuity of the reform implementation in the 2014 survey is not likely to be driven by some underlying relationship between age and school completion but is rather an outcome of the reform.

While the RD graphs reveal a positive treatment effect of being exposed to the compulsory schooling reform on educational attainment, the results could be further refined with regression analysis. Table 2 presents the RD treatment effects on years of schooling and the completion of different levels of education for all women surveyed in the 2014 NSDVW. The last column in each row reports outcome means for the relevant sample. Column 4 shows the optimal bandwidth estimated by the [Imbens and Kalyanaraman \(2009\)](#) algorithm in months on each side of the discontinuity. In all specifications, we include as controls a dummy variable for whether the respondent grew up in a rural location, a dummy variable for whether the respondent's mother tongue is not Turkish, month-of-birth fixed effects, childhood-region fixed effects, and interactions of childhood-region fixed effects with an indicator for rural childhood regions.

The first row of Table 2 reports estimates of the RD treatment effects on women's years of schooling. The optimal bandwidth, calculated using the [Imbens and Kalyanaraman](#)

(2009) algorithm, is 89 months around the discontinuity. Using a local linear specification, column 1 reports an RD estimate of 0.70 years for the treatment effect on years of schooling, which is statistically significant at the five percent level. In terms of magnitude, an increase of 0.70 years in the years of schooling corresponds to an 8.3 percent increase relative to the mean. To check for robustness, we add alternative specifications by allowing the bandwidth to vary and report the linear RD estimates with 0.75 and 1.5 times the optimal bandwidth in columns 2 and 3, respectively. The estimated effects remain significant, within an approximate range of 0.7 to one year.

The remaining rows of Table 2 report the RD treatment effects on different levels of school completion. The second row displays the estimated RD treatment effects for an indicator variable capturing whether the respondent completed junior high school or higher. The linear specification with the optimal bandwidth in column 1 reports an RD estimate of 19 ppt, corresponding to 32 percent relative to the mean. In alternative specifications, the estimates remain significant. The third row indicates that the linear RD estimate of the treatment effect on completing high school is 13 ppt, and it remains significant in alternative specifications. This finding implies that the reform had long-term effects in enabling some women to continue beyond junior high school. As expected, all RD estimates for whether the respondent completed primary school are insignificant. These results for primary school completion provide a robustness check, showing that the reform did not influence the likelihood of completing primary school, which was already mandatory prior to 1997.<sup>27</sup>

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<sup>27</sup>One obvious question is whether the 1997 reform had an effect on male schooling outcomes. Figure A1 plots the average junior high school completion for women and men using the 2014 Household Labor Force Survey (HLFS). The graph on the left shows evidence of a clear jump for the junior high school completion of women, whereas the right-side graph shows no evidence of a significant jump for the same outcome for men. This result implies that the reform had a much smaller effect on men, possibly because the junior high school completion rate for males was already close to 90 percent prior to the reform. Unfortunately, we cannot replicate the same exercise for men using the NSD VW 2014, since the month of birth for husbands is not reported in the dataset.



## 4.2 Education and Legal Awareness

One of the major benefits of education is that additional years of schooling reduce the costs of obtaining new information and using it. [Schultz \(1975\)](#) shows that additional years of schooling improve information acquisition and learning. More-educated individuals gain not only the ability to acquire new information by having access to multiple sources of information but also the ability to process that information to make better decisions. Without adequate levels of education, it is generally difficult for individuals to process and act upon new information even if it is accessible. Studies in the education-health literature have demonstrated that more-educated individuals more quickly employ new medical technologies ([Glied and Lleras-Muney 2008](#)) and utilize new public information for making better health decisions ([Aizer and Stroud 2010](#); [Lange 2011](#)). In a similar vein, education may enhance the ability to acquire information about changes in laws and services related to gender equality and improve the ability to process this new legal knowledge to make better decisions. One of the implications is that the more educated may gather information about new laws and services more quickly compared to the less educated, while there may not be differential effects on the awareness of pre-existing legislation by education level.

We test whether the compulsory schooling reform had a significant impact on legal awareness of gender equality and the prevention of domestic violence. [Figure 5](#) plots the local averages of the two summary indices of women’s legal awareness of laws in month-of-birth bins around the discontinuity, January 1987. The graph on the left shows no evidence of a significant break in the awareness of pre-existing laws index, whereas the right-hand graph shows evidence of a clear jump in the awareness of new laws index. This finding about the pre-existing laws is not surprising, since these laws are almost a century old and probably *common knowledge*, so there is no reason why more educated women should get to know about them more. While these graphs illustrate a positive RD treatment effect

on legal awareness of new laws with no evidence of a significant effect for legal awareness of pre-existing laws, the results can be elaborated with regression analysis.

Table 3 reports the RD estimates of the effect of the compulsory schooling reform on women's information about laws and services. In Panel A, the OLS estimates in column 1 indicate the presence of a positive correlation between years of schooling and indicators of awareness of pre-existing laws. The magnitudes of the correlations suggest that one additional year of schooling corresponds to a 0.7 ppt higher probability of having heard about the law stating that men and women have to be at least 17 years old to get married, a 0.3 ppt higher probability of being aware that it is illegal for parents and other relatives to have their children below the age of 15 married and that doing so is punishable by imprisonment, a 0.3 ppt higher probability of being aware that it is illegal to have a religious marriage before an official one, and a 0.8 ppt higher likelihood of knowing that polygamy is illegal. Similarly, the correlations show that one additional year of schooling corresponds to 0.8 ppt higher probability of having heard about the law stating that the perpetrator of violence is kept away from the common residence to protect the victims of violence, a 1.8 ppt higher likelihood of being aware that the perpetrator is prevented from approaching or contacting the victims of violence, and a 1.1 ppt higher likelihood of knowing that if the victim's life is in danger, the victim is provided temporary protection services.

The RD estimates in Panel A of Table 3 in columns 2 and 3 show no evidence of a significant effect of the reform on awareness of any of the pre-existing laws. We also find no evidence that the reform had a significant impact on the awareness of pre-existing laws index, a summary measure that aggregates information from individual components of pre-existing laws.

In Panel B of Table 3, the OLS estimates in column 1 indicate that one additional year of schooling is positively associated with a 0.5 ppt higher probability of being aware that marital rape is illegal, a 1.6 ppt higher likelihood of knowing that a woman is not required

to have her husband's permission to work outside the home, a 0.8 ppt higher likelihood of being aware that spouses share the property that they obtained during marriage after they get divorced, and a 1.1 ppt higher probability of knowing that shelters are provided for victims of domestic violence and their children.

The RD estimates in columns 2 and 3 of Panel B in Table 3 indicate that the reform had a positive impact on the awareness of new laws. The RF RD estimate in column 2 of the last row shows that the reform had a positive and significant impact of 11 ppt on the awareness of new laws index. The IV estimate in column 3 is consistent with the RF estimate, and both the RF and IV estimates are precisely estimated, being significant at the one percent level. In terms of magnitudes, the RD treatment effect on awareness of new laws index corresponds to 0.21 standard deviations.

Moreover, the RD estimates for several specific articles listed in Panel B of Table 3 are also significant and positive. The first-row RF estimates in column 2 indicate that the reform had a positive impact of 6 ppt on the likelihood of being aware of the amendment to the 2005 Penal Code that marital rape is illegal, which corresponds to a 8.3 percent increase relative to the sample mean. The IV estimate in column 3 is also precisely estimated and confirms this effect. In the second row, the RD estimates indicate that the reform had a significant and positive effect of 9.2 ppt on legal awareness of the amendment to the 2001 Civil Code stating that a woman is not required to have her husband's permission to work outside the home. In terms of magnitude, this corresponds to a 20 percent increase relative to the sample mean.

Regarding awareness related to laws on domestic violence, the RD estimates show that the reform had a significant impact of 3.9 ppt on being aware of an article introduced in the 2012 Law to Prevent Domestic Violence, which states that shelters are provided for people who experience domestic violence and their children. This corresponds to a five percent increase relative to the sample mean. Similarly, the RD estimates in the fifth row indicate that the reform had a positive effect of 9.5 ppt on increasing awareness of

other articles of the same law, asserting that if the perpetrator is addicted to alcohol or drugs, he is provided with diagnosis and treatment opportunities. This corresponds to a 16 percent increase relative to the sample mean. In the sixth row, the RD estimates show that the reform had a positive impact of 6.2 ppt on having heard about the provision that the victim of violence is provided with childcare services, corresponding to a 16 percent increase relative to the mean. Finally, the RD estimates in the seventh row show that the reform had a large and significant impact on one of the most distinguishing features of the 2012 Law to Prevent Domestic Violence. The RD estimates in column 2 indicate that the reform had a positive impact of 5.5 ppt on being aware that services are provided to the victims of violence by the VPSCs, corresponding to a 46 percent increase relative to the sample mean. Overall, the large magnitudes of these RD treatment effects imply that the reform was particularly successful in raising women's awareness of several new laws and services introduced in the post-2000 period to reduce gender inequalities and prevent domestic violence in Turkey.

Another question of interest that we explore is whether the reform had a significant effect on sources of information through which women gained an awareness of the new laws and services. Figure 6 provides a graphical illustration of the RD treatment effects on having heard about new laws from different sources. At the discontinuity in the upper-left graph, we see no evidence of a significant jump in having heard about the new laws from TV index. However, in the upper-right graph of Figure 6, we see clear evidence of a significant upward shift in having heard about the new laws from newspapers, journals, or books index. In contrast, the bottom graphs of Figure 6 show no evidence of a significant jump at the discontinuity for having heard about the new laws from family and friends index or the having heard about the new laws from formal institutions index.

To examine the effects of the reform on sources of information about new laws in a more refined analysis, we provide the results of RD regressions in Table 4. The OLS estimates in column 1 indicate the presence of a positive correlation between years of schooling

and the indices of having heard about the new laws from newspapers, journals, or books and from formal institutions and a negative correlation between years of schooling and having heard about the new laws from family and friends (social networks) index. The magnitudes of the correlations imply that one additional year of schooling corresponds to a 7.9 ppt higher likelihood of having heard about the new laws from newspapers, journals, or books, a 3.9 ppt higher likelihood of having heard about them from formal institutions, and a 1.8 ppt lower likelihood of having heard about them from family and friends. In contrast, we find no evidence of a significant correlation between education and receiving information about new laws from TV, which is unsurprising because TV usage is very widespread across all educational groups and socioeconomic backgrounds in Turkey.

The RD results in the first row of Table 4 show no evidence of a significant effect of the reform on having heard about the new laws from TV. In the second row, the RF estimate indicates that the reform had a significant and positive impact of 13.6 ppt on having heard about the new laws from newspapers, journals, or books, corresponding to 0.15 standard deviations of the outcome. The IV estimate is also consistent with this finding and is marginally significant. The RD estimates in the subsequent rows indicate no evidence of a significant effect of the reform on having heard about the new laws from friends and family or from formal institutions.

As a robustness check, Table A3 in Online Appendix B reports the RD estimates using a static bandwidth of 118 months around the cutoff, which is the optimal bandwidth estimated for junior high school completion. The findings in the table show that the RD estimates for awareness of the new laws index and having heard about the new laws from newspapers, journals, or books index are robust to this specification. The RD results for the awareness of pre-existing laws index and indices of having heard about the new laws from TV, friends and family and formal institutions also remain insignificant in this specification.

Altogether, our results provide evidence that additional years of schooling allowed

women to acquire information about new laws and services pertaining to gender equality and domestic violence through reading newspapers, journals, or books. We also find no evidence of a significant impact of education on awareness of pre-existing laws and services dating back to the 1920s. In the next section, we explore whether the reform-induced improvement in legal knowledge led to changes in domestic violence and the ability to quit abusive relationships.

### 4.3 Education and Domestic Violence

If having additional years of schooling improves women's legal awareness of new laws designed to enhance gender equality and reduce domestic violence, it may lead to a change in domestic violence outcomes. For example, if women are more aware that they are strictly protected from the abusing partner, they might be more likely to ask for protection from the police. Similarly, if women have heard about laws that provide temporary financial assistance and childcare services, they might have a stronger fallback position and, thus, a more credible threat of leaving the abusive relationship. The favorable shift in women's bargaining position might then result in a decline in domestic violence, as well as an increase in probability of leaving home or filing for divorce after experiencing domestic violence ([Farmer and Tiefenthaler 1996](#); [Aizer 2011](#)).

We examine this possibility by testing whether the reform had a significant impact on domestic violence and divorce outcomes. Table 5 presents the results. The OLS estimates in column 1 indicate that there is a negative correlation between years of schooling and all measures of domestic violence as well as the probability of having a second marriage. The magnitudes of the correlations suggest that one additional year of schooling is associated with 2.7 ppt less physical violence, 2.2 ppt less sexual violence, 2.0 ppt less psychological violence, 1.5 ppt less financial control exercised by the intimate partner, and a 0.4 ppt lower probability of having a second marriage.

The RD estimates in columns 2 and 3 of Table 5 indicate no evidence of a significant

impact of the reform on domestic violence or divorce outcomes. The only significant estimate is the RF estimate for the physical violence index, which is no longer significant in the IV specification. Hence, we find no consistent evidence that the reform had a significant impact on physical violence, sexual violence, psychological violence, or financial control indices. We also find no evidence of a significant effect of the reform on ever leaving home, ever getting divorced, or having a second marriage.

We conducted several robustness checks. First, Table A3 in Online Appendix B presents the RD results using a static bandwidth of 118 months around the cutoff, the optimal bandwidth estimated for junior high school completion. The findings in the table show that the RD estimates for the physical violence index and divorce-related outcomes are robust to this specification. Second, to accommodate a more flexible specification, we report RD estimates using a quadratic control function in Table A4. The estimated RD treatment effects are similar to those reported in our main tables. Third, Figure A2 presents RD estimates in much smaller bandwidths of including 48 months around the discontinuity. Although our sample size drops drastically, we observe qualitatively similar RD treatment effects to those in main results presented in the paper. Finally, Appendix Table A5 also shows that the effect of reform on schooling is slightly larger for women raised in rural regions, roughly 1.1 years of additional schooling. This table also illustrates that our main results hold for women raised in rural regions.<sup>28</sup>

Finally, it is important to note that this study relates to our earlier work on education and the prevalence of domestic violence in Turkey closely. However, by investigating an alternative and potentially important channel—women’s awareness of law intended to empower them—this paper contributes to our understanding of effectiveness of compulsory schooling in a context of significant limitations on women’s rights. First, using an earlier version of the same data source—the 2008 TNSDVW—Erten and Keskin (2018) demon-

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<sup>28</sup>The only exception is the reform’s effect on the ways in which women learned about the new laws. Education does not have a significant effect on rural women’s likelihood of learning about the reforms from newspapers, journals or books. This can be explained by the limited supply of these news outlets in the rural Turkey.

strate that increased female education led to an improvement in the labor market outcomes of women (i.e., those younger than 21 years old in 2008), and the increase in women’s personal income generated incentives for male partners to use violence as an instrument for extracting rents from women. However, in subsequent work (Erten and Keskin 2019), using the current dataset (2014 NSDVW), we find no evidence of a significant impact of female education on the labor market outcomes of women (i.e., those younger than 27 years old in 2014), given the completed fertility outcomes and increase in childcare responsibilities for this age group.<sup>29</sup> As a result, the underlying mechanism for the greater exposure to psychological violence and financial control behavior is no longer present. Hence, we find no change in these indicators of intimate partner violence for this age group (Erten and Keskin 2019).

Altogether, our findings from our previous work on the effects of the reform on labor market outcomes and prevalence of domestic violence imply that since the reform did not significantly change employment of women in their late 20s, it did not result in an increase in violent behavior towards these women. In the absence of labor market induced effects of increased schooling on domestic violence, we would expect that if legal awareness improves the bargaining power of women, we would observe a significant reduction in the degree of violence they face from their partners. The fact that we found no such effect suggests that improvements in legal awareness do not always translate into empowerment of women within the household.

## 5 Conclusion

In this paper, we provide evidence of the impact of an extension of compulsory schooling that exogenously raised average educational attainment on the acquisition of legal information in Turkey. Employing an RD design allows us to estimate the causal effects of the education reform on women’s legal awareness of laws on gender equality and domestic

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<sup>29</sup>We replicate these results in Appendix Table A6 for the sample of all women in our optimal bandwidths.



violence, as well as actual domestic violence and divorce outcomes. To the best of our knowledge, this is the first quantitative analysis that examines the impact of education on an unexamined dimension of information acquisition, namely legal awareness, and the source of such information acquisition. Given that knowledge on legal rights and availability of services has been widely accepted as a necessary condition for women to access the legal system, we also assess whether this information acquisition translates into important differences in real life experiences related to domestic violence and divorce.

Our findings reveal that the reform had a positive impact on women's legal knowledge about new laws and services introduced to reduce gender inequalities and prevent domestic violence; however, this improvement in legal awareness did not translate into significant changes in domestic violence or divorce outcomes. Interestingly, we find no evidence of a significant impact of the education reform on women's knowledge about pre-existing laws dating back to the early twentieth century. We also show that the reform significantly increased the likelihood of acquiring information about new laws and services through newspapers, journals, or books. Although our findings suggest a complementarity between education and legal information provision, we find no evidence indicating that the reform had a significant impact on domestic violence measures or divorce-related outcomes. In particular, we find no evidence of a change in the prevalence of physical, sexual or psychological violence or financial control behavior exercised by intimate partners. We also find no evidence of a reform-induced change in ever leaving home after experiencing domestic violence, ever getting divorced, or having a second marriage.

Our results indicate that although education has a significant and large impact on the acquisition of legal information, this improvement in legal awareness does not necessarily translate into the differences in outcomes that these laws were intended to have. These findings parallel those documented in the education-health literature, indicating that education generally affects the acquisition of health-related information; however, the improvements in health-specific knowledge account for only small differences in behavior

and health outcomes. Similar to the findings in the health literature relating to new technologies and new advances in medical knowledge, we detect significant effects of education only on knowledge related to newly introduced changes in gender-equality legislation, as opposed to pre-existing legislation that has long been in place. Our findings also suggest that while improving legal knowledge could be an important step toward raising awareness of women's rights, it may not be sufficient to strengthen women's bargaining power within the household to reduce the prevalence of domestic violence.

### **Compliance with Ethical Standards**

**Conflict of Interest:** The authors declare that they have no conflict of interest.

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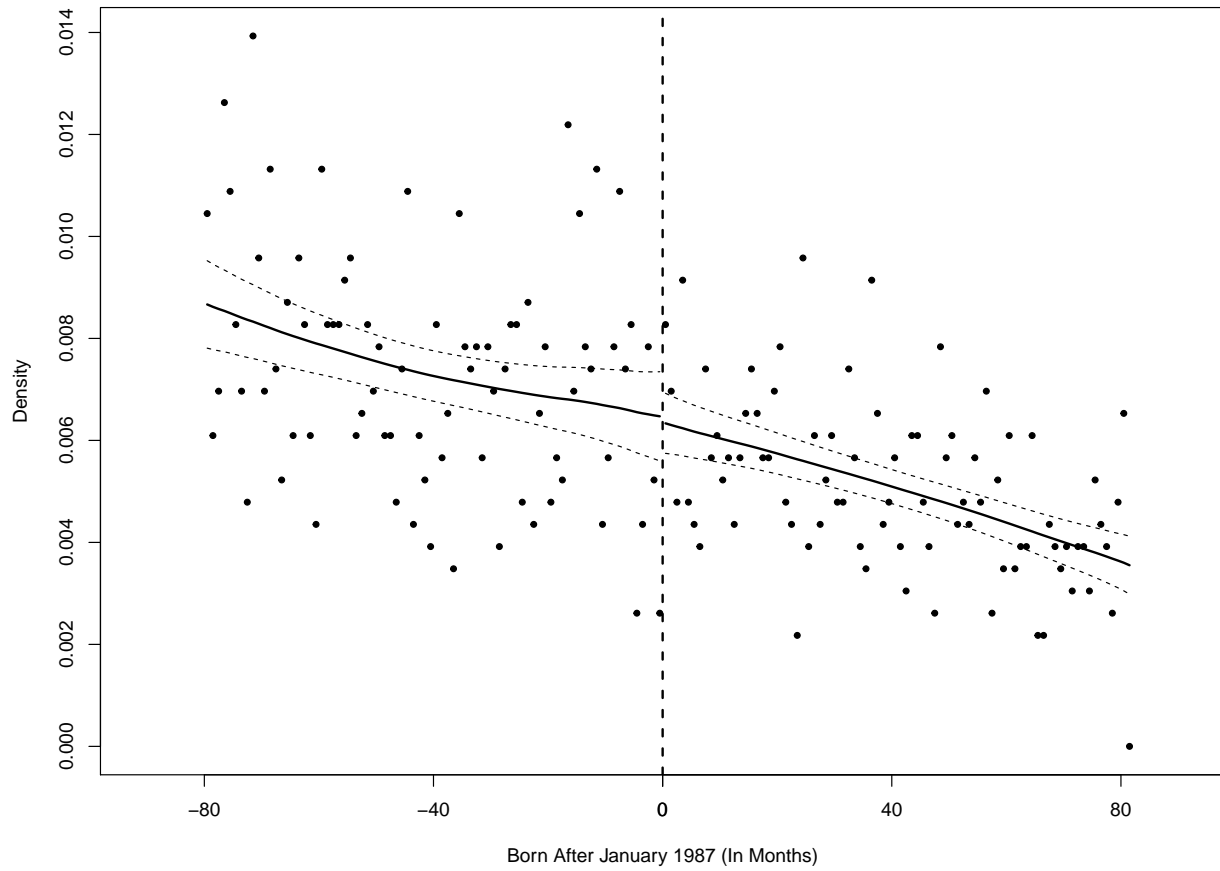
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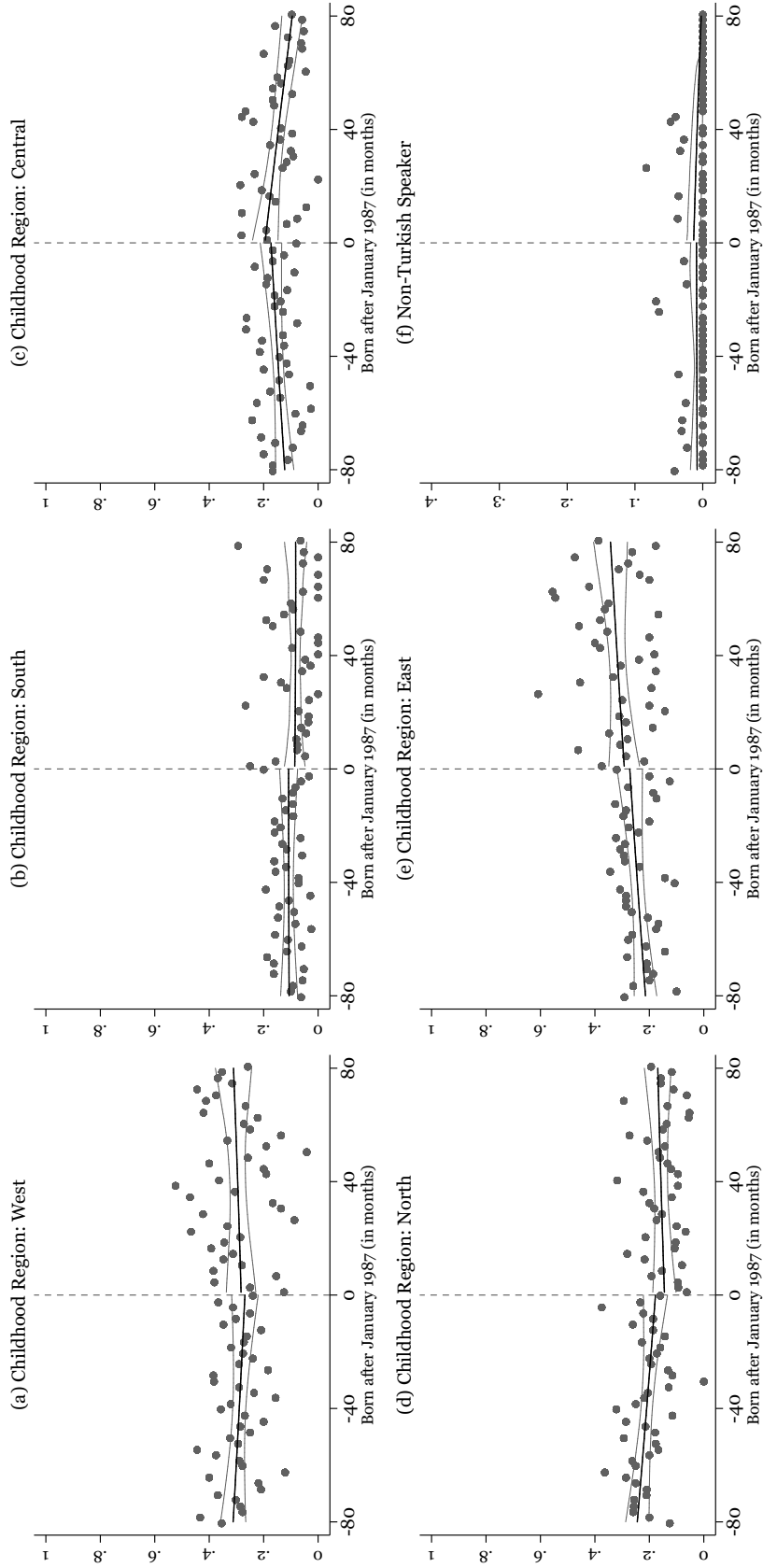
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FIGURE 1: McCRARY DENSITY TEST



*Note:* Data are from the 2014 National Survey on Domestic Violence against Women in Turkey. The graph shows the results of the McCrary test of whether there is a discontinuity in the density of the forcing variable, the month of birth.

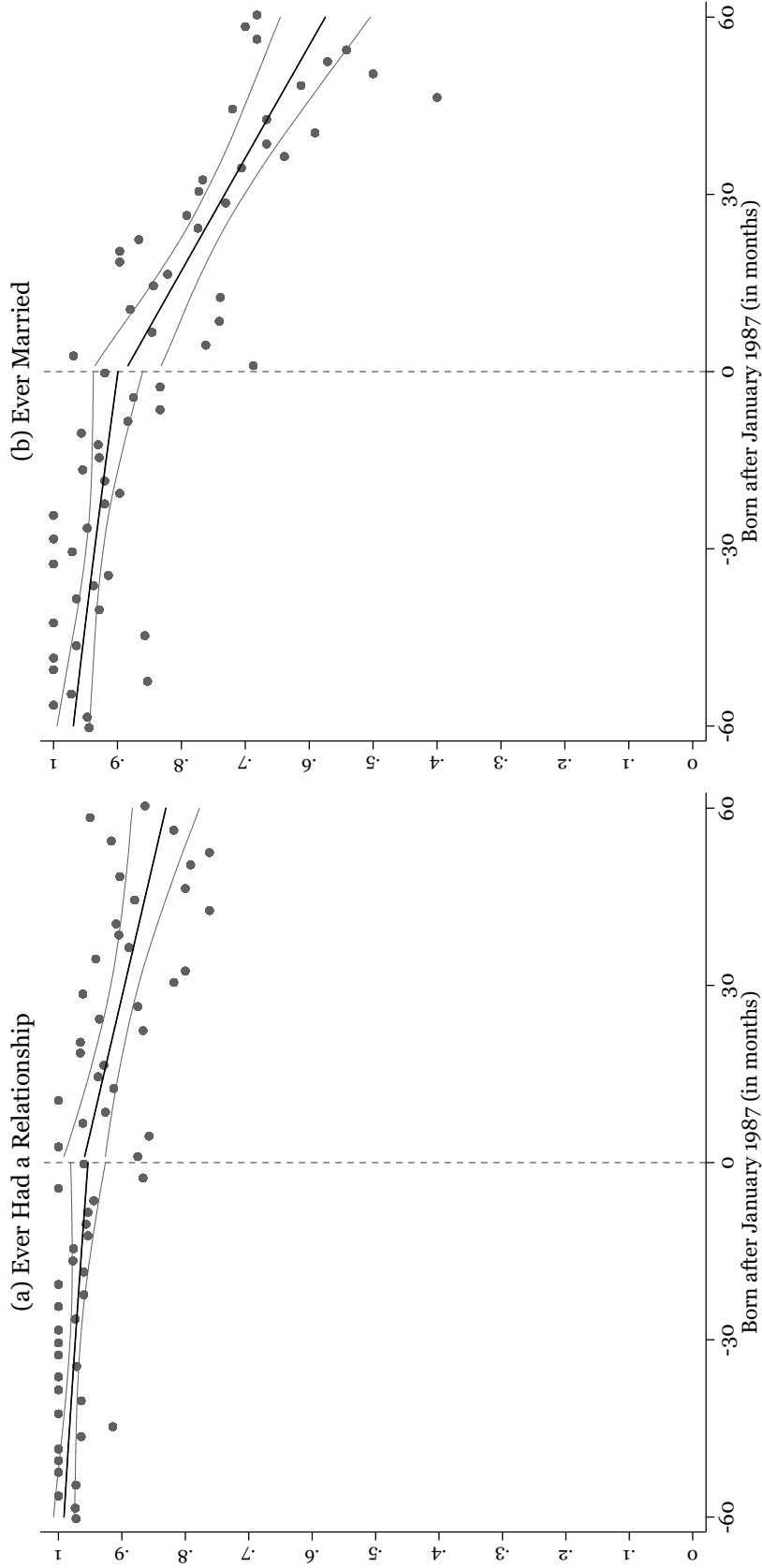
FIGURE 2: BALANCED COVARIATES



Note: Data are from the 2014 National Survey on Domestic Violence against Women in Turkey. The figures plot predetermined covariates in monthly bins against the month-year of birth of being born in January 1987. The vertical line in each graph represents the cut-off point, January 1987. Gray lines show 95 percent confidence intervals around the mean level. Variable definitions are listed in Online Appendix A.

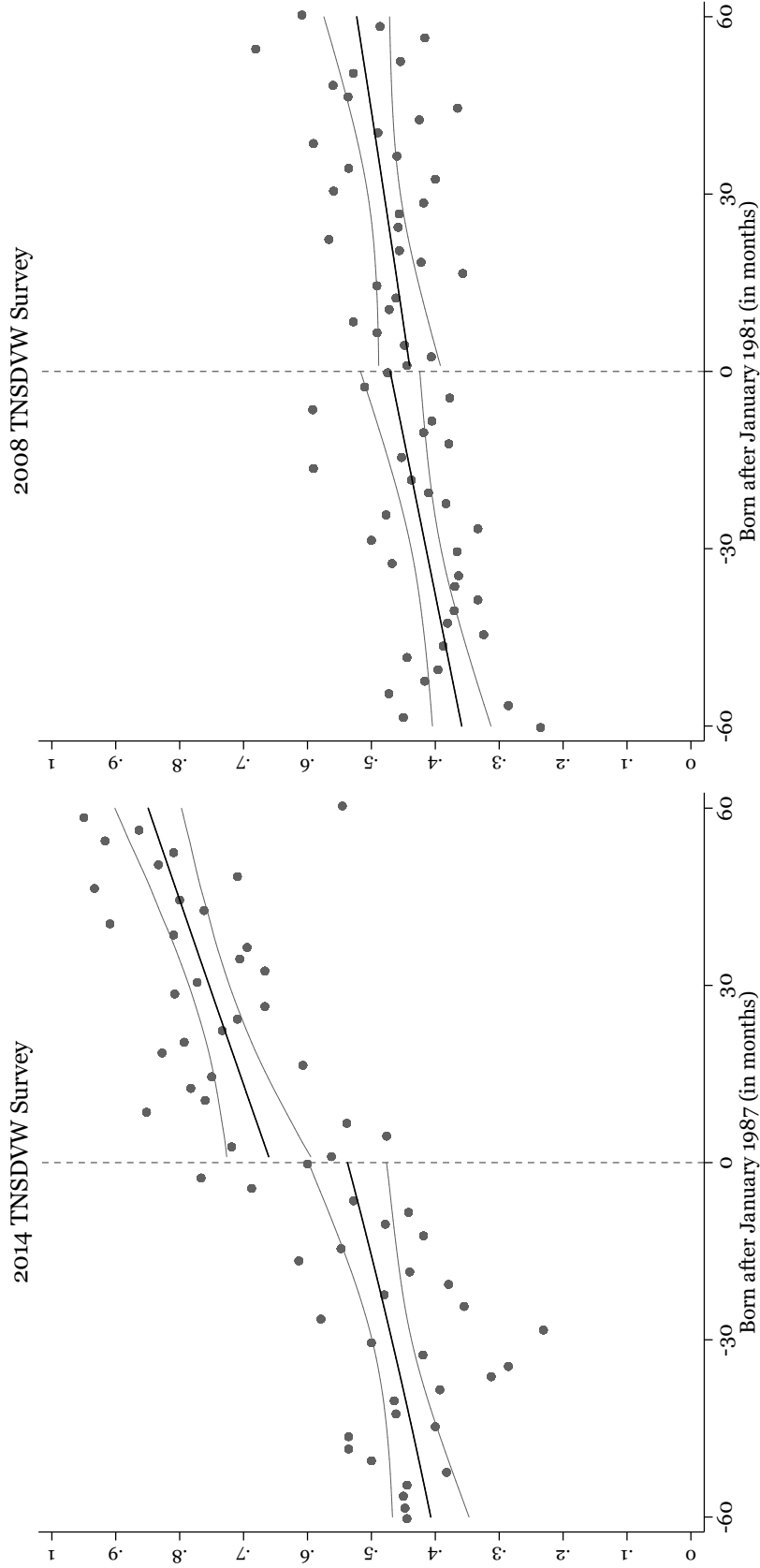


FIGURE 3: RD TREATMENT EFFECTS ON RELATIONSHIP STATUS



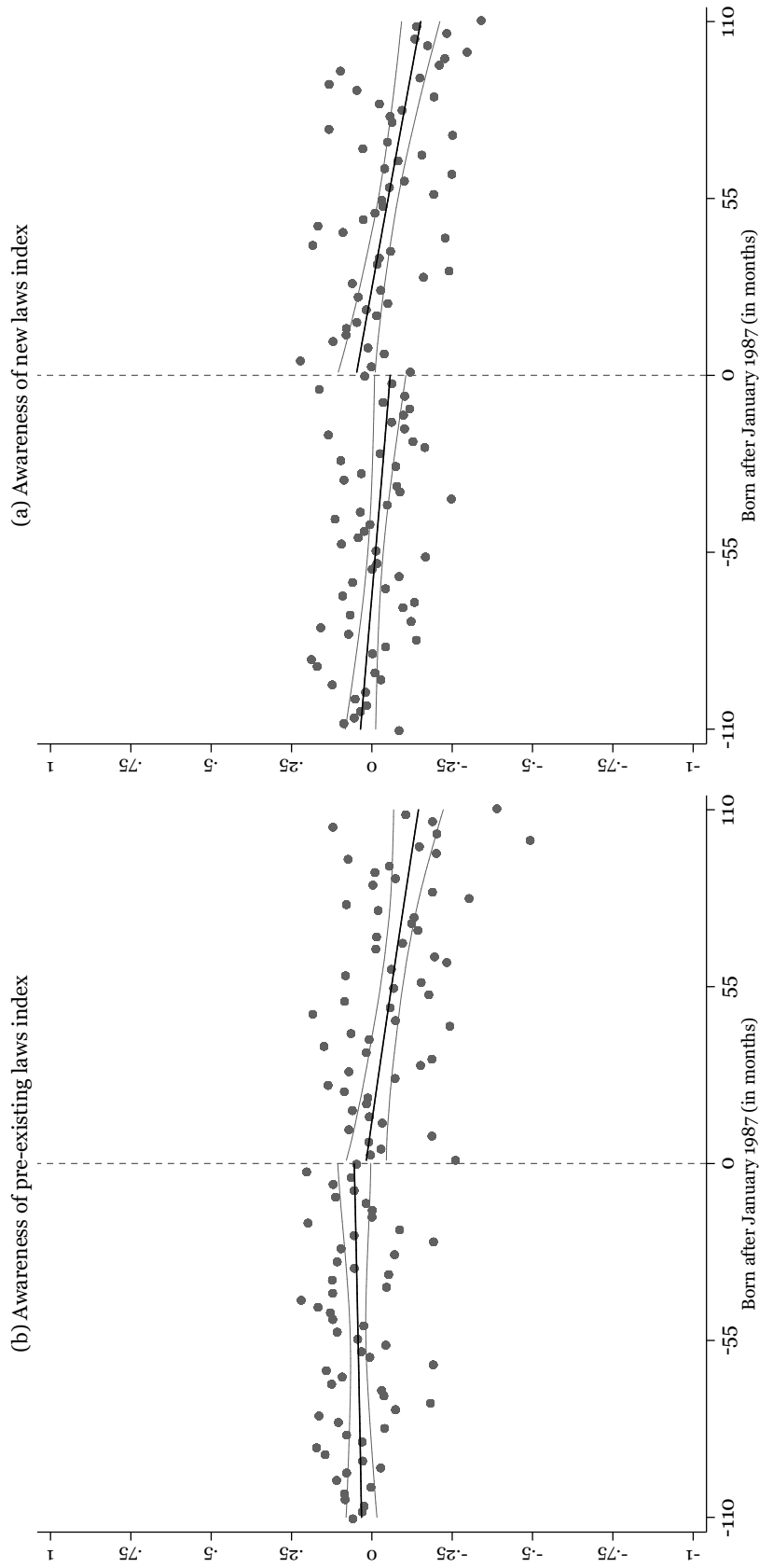
*Note:* Data are from the 2014 National Survey on Domestic Violence against Women in Turkey. The sample includes all women born before and after 60 months around the cutoff point, January 1987. The figures plot a dummy variable equal to one if the respondent has ever had a relationship and a dummy variable equal to one if the respondent has ever been married in monthly bins. The vertical line in each graph represents the cut-off point, January 1987. Gray lines show 95 percent confidence intervals around the mean level.

FIGURE 4: RD TREATMENT EFFECTS ON JUNIOR HIGH SCHOOL COMPLETION: TREATMENT AND PLACEBO



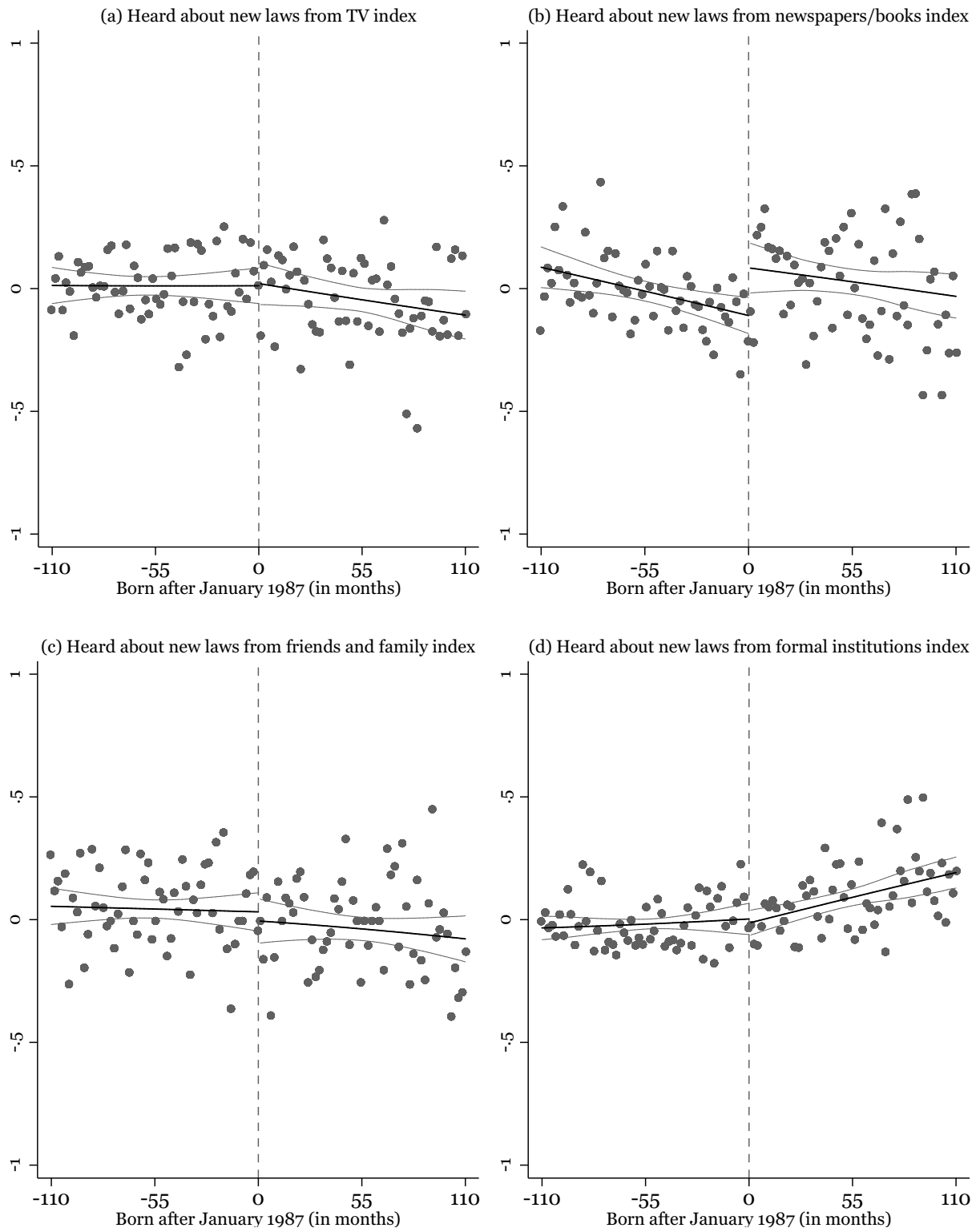
Note: Data are from the 2014 and 2008 National Surveys on Domestic Violence against Women in Turkey, respectively. The figures plot a dummy variable equal to one of the respondent completed junior high school in monthly bins. Gray lines show 95 percent confidence intervals around the mean level.

FIGURE 5: RD TREATMENT EFFECTS ON INFORMATION ABOUT LAWS



Note: Data are from the 2014 National Survey on Domestic Violence against Women in Turkey. The figures plot awareness of pre-existing laws index and awareness of new laws index in monthly bins. Gray lines show 95 percent confidence intervals around the mean level.

FIGURE 6: RD TREATMENT EFFECTS ON SOURCES OF INFORMATION ABOUT NEW LAWS



Note: Data are from the 2014 National Survey on Domestic Violence against Women in Turkey. The figures plot z-score indices of having heard about the new laws from TV, newspapers/journals/books, friends and family, and formal institutions in monthly bins. Gray lines show 95 percent confidence intervals around the mean level.

TABLE 1: SUMMARY STATISTICS FOR 17- TO 37-YEAR-OLD WOMEN

	Mean	S.D.	Min.	Max.	Obs.
<b>Panel A: Education</b>					
Years of schooling	8.30	4.04	0.00	21.00	3328
Completed junior high school	0.58	0.49	0.00	1.00	3329
Completed high school	0.36	0.48	0.00	1.00	3329
Completed primary school	0.92	0.27	0.00	1.00	3329
<b>Panel B: Information about Pre-existing Laws and Services</b>					
Men and women have to be at least 17 years old to get married.	0.87	0.34	0.00	1.00	3329
It is illegal for parents and other relatives to have their children below the age of 15 married, and that doing so is punishable by imprisonment.	0.93	0.26	0.00	1.00	3329
It is illegal to have a religious marriage before official marriage.	0.83	0.38	0.00	1.00	3329
It is illegal for a man to marry more than one woman.	0.84	0.37	0.00	1.00	3329
The perpetrator is kept away from the common residence to protect the victims of violence.	0.88	0.33	0.00	1.00	3327
The perpetrator is prevented from approaching or contacting the protected victims of violence.	0.78	0.42	0.00	1.00	3325
If the victim's life is in danger, the victim is provided temporary protection services.	0.86	0.35	0.00	1.00	3326
Awareness of pre-existing laws index	0.00	0.58	-2.50	0.41	3329
<b>Panel C: Information about New Laws and Services</b>					
It is illegal for a man to have sex with his wife without her consent.	0.70	0.46	0.00	1.00	3329
A woman is not required to have her husband's permission to work outside the home.	0.42	0.49	0.00	1.00	3329
After spouses get divorced, they share the property that they obtained during their marriage.	0.91	0.29	0.00	1.00	3329
Shelters are provided for people who experienced domestic violence and their children.	0.86	0.35	0.00	1.00	3327
If the perpetrator is addicted to alcohol or drugs, he is provided with diagnosis and treatment opportunities.	0.59	0.49	0.00	1.00	3321
The victim of violence is provided with childcare services.	0.38	0.49	0.00	1.00	3325
Services are provided to victims of violence by the Violence Prevention and Supervision Centers (VPSC).	0.12	0.33	0.00	1.00	3329
The victims of violence are provided temporary financial support.	0.48	0.50	0.00	1.00	3326
The perpetrator is prevented from selling the shared home.	0.41	0.49	0.00	1.00	3323
Awareness of new laws index	-0.02	0.54	-1.35	1.04	3329
<b>Panel D: Sources of Information about New Laws and Services</b>					
Heard about new laws from TV index	-0.01	0.85	-2.66	0.39	3329
Heard about new laws from newspapers, journals, or books index	0.01	0.90	-0.43	2.34	3329
Heard about new laws from friends and family (social networks) index	0.01	0.85	-1.06	1.00	3329
Heard about new laws from formal institutions index	0.03	0.58	-0.23	5.80	3329
<b>Panel E: Domestic Violence and Divorce Outcomes</b>					
Physical violence index †	-0.05	0.75	-0.42	2.81	2977
Sexual violence index †	-0.04	0.74	-0.27	4.37	2977
Psychological violence index †	0.03	0.54	-0.61	2.11	2977
Financial control behavior †	-0.03	0.82	-0.31	4.30	2892
Ever left home ††	0.34	0.47	0.00	1.00	841
Ever divorced	0.05	0.22	0.00	1.00	3329
Second marriage	0.02	0.15	0.00	1.00	3329

Notes: The table presents the means, standard deviations, minimum values, maximum values, and number of observations from the 2014 National Survey on Domestic Violence against Women in Turkey. The sample includes women who were born within 118 months before or after January 1987. The variables with a † sign are available only for women who have had a relationship, and the variable with a †† sign is available for women who have faced physical violence from their partners. The variables are described in Appendix A.

TABLE 2: RD TREATMENT EFFECTS ON SCHOOLING OUTCOMES

	(1)	(2)	(3)	(4)	(5)	(6)
	Linear RD	Linear RD	Linear RD			
	$\hat{h}$ bandwidth	$0.75\hat{h}$ bandwidth	$1.5\hat{h}$ bandwidth	Bandwidth	N	Mean
Years of schooling	0.704** (0.327)	0.769** (0.365)	1.031*** (0.267)	89	2,492	8.48
Completed education:						
Junior high school	0.192*** (0.031)	0.186*** (0.037)	0.186*** (0.027)	118	3,308	0.60
High school	0.125*** (0.044)	0.081* (0.048)	0.078** (0.038)	65	1,837	0.40
Primary school	-0.020 (0.024)	-0.031 (0.028)	-0.020 (0.020)	93	2,630	0.91

*Notes:* Data are from the 2014 National Survey on Domestic Violence against Women in Turkey. Columns 1 – 3 report local RD regressions with linear polynomials in the month-year of birth using the optimal bandwidth  $\hat{h}$ ,  $0.75\hat{h}$  and  $1.5\hat{h}$ , respectively. The optimal bandwidth, reported in column 4, is estimated by using the Imbens and Kalyanaraman (2009) algorithm. Column 5 reports the number of observations used in estimations with the optimal bandwidth  $\hat{h}$ , and column 6 reports the outcome mean within the optimal bandwidth  $\hat{h}$ . All results are reported for the full sample of women. The variables are described in Appendix A. All specifications control for a dummy variable for whether the respondent grew up in a rural location, a dummy variable for whether the respondent’s mother tongue is not Turkish, month-of-birth fixed effects, region fixed effects, and interactions of region fixed effects with an indicator of rural regions. Standard errors are clustered at the month-year cohort level. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.

TABLE 3: EFFECTS OF EDUCATION ON INFORMATION ABOUT LAWS AND SERVICES

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	RF	IV	Bandwidth	N	Mean
<b>Panel A: Pre-existing Laws</b>						
Men and women have to be at least 17 years old to get married.	0.007*** (0.002)	-0.034 (0.025)	-0.043 (0.038)	99	2,761	0.88
It is illegal for parents and other relatives to have their children below the age of 15 married, and that doing so is punishable by imprisonment.	0.003** (0.001)	0.003 (0.019)	0.003 (0.019)	131	3,606	0.92
It is illegal to have a religious marriage before official marriage.	0.003* (0.002)	0.001 (0.026)	0.001 (0.024)	138	3,765	0.83
It is illegal for a man to marry more than one woman.	0.008*** (0.002)	0.001 (0.023)	0.001 (0.024)	129	3,580	0.86
The perpetrator is kept away from the common residence to protect the victims of violence.	0.008*** (0.002)	0.001 (0.024)	0.001 (0.029)	108	3,003	0.88
The perpetrator is prevented from approaching or contacting the protected victims of violence.	0.018*** (0.002)	-0.032 (0.027)	-0.026 (0.024)	157	4,162	0.80
If the victim's life is in danger, the victim is provided temporary protection services.	0.011*** (0.002)	-0.016 (0.022)	-0.018 (0.025)	122	3,399	0.87
Awareness of pre-existing laws index	0.023*** (0.003)	-0.026 (0.035)	-0.026 (0.037)	131	3,630	0.02
<b>Panel B: New Laws</b>						
<i>(a) 2001 Civil Code and 2005 Penal Code</i>						
It is illegal for a man to have sex with his wife without her consent.	0.005** (0.002)	0.060* (0.034)	0.061* (0.036)	126	3,503	0.72
A woman is not required to have her husband's permission to work outside the home.	0.016*** (0.003)	0.092** (0.040)	0.132* (0.078)	94	2,630	0.45
After spouses get divorced, they share the property that they obtained during their marriage.	0.008*** (0.001)	-0.008 (0.021)	-0.009 (0.022)	126	3,503	0.92
<i>(b) 2012 Law to Prevent Domestic Violence</i>						
Shelters are provided for people who experienced domestic violence and their children.	0.011*** (0.002)	0.039* (0.023)	0.048* (0.028)	111	3,100	0.86
If the perpetrator is addicted to alcohol or drugs, he is provided with diagnosis and treatment opportunities.	0.003 (0.003)	0.095*** (0.031)	0.085*** (0.033)	142	3,880	0.59
The victim of violence is provided with childcare services.	-0.004 (0.003)	0.062* (0.036)	0.074 (0.049)	116	3,246	0.38
Services are provided to victims of violence by the Violence Prevention and Supervision Centers (VPSC).	0.003 (0.002)	0.055*** (0.020)	0.049** (0.021)	166	4,280	0.12
The victims of violence are provided temporary financial support.	-0.004 (0.003)	0.055 (0.039)	0.051 (0.039)	138	3,785	0.48
The perpetrator is prevented from selling the shared home.	0.003 (0.003)	0.062 (0.040)	0.076 (0.052)	111	3,096	0.43
Awareness of new laws index	0.012*** (0.003)	0.110*** (0.036)	0.102*** (0.038)	137	3,765	-0.01

Notes: Data are from the 2014 National Survey on Domestic Violence against Women in Turkey. The optimal bandwidth is estimated by using the Imbens and Kalyanaraman (2009) algorithm. Column 1 reports OLS results using years of schooling as the independent variable for an optimal bandwidth  $\hat{h}$  estimated by the Imbens and Kalyanaraman algorithm. Columns 2 and 3 report reduced-form (RF) RD treatment effects and two-stage least-squares (IV) RD treatment effects (by using treatment as an instrument for years of schooling) of being born after January 1987 with a linear control function in the month-year of birth on each side of the discontinuity. The variables are described in Appendix A. All specifications control for a dummy variable for whether the respondent grew up in a rural location, a dummy variable for whether the respondent's mother tongue is not Turkish, month-of-birth fixed effects, region fixed effects, and interactions of region fixed effects with an indicator of rural regions. Standard errors are clustered at the month-year cohort level. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.

TABLE 4: EFFECTS OF EDUCATION ON SOURCES OF INFORMATION ABOUT NEW LAWS AND SERVICES

	(1) OLS	(2) RF	(3) IV	(4) Bandwidth	(5) N	(6) Mean
<i>Heard about the new laws and services from the following sources:</i>						
TV	-0.000 (0.005)	-0.035 (0.058)	-0.046 (0.079)	114	3,165	-0.01
Newspapers, journals, or books	0.079*** (0.005)	0.136** (0.069)	0.162* (0.089)	116	3,250	0.05
Friends and family (social networks)	-0.018*** (0.005)	-0.031 (0.062)	-0.031 (0.060)	134	3,709	0.01
Formal institutions	0.039*** (0.004)	-0.022 (0.037)	-0.025 (0.045)	120	3,331	0.02

*Notes:* Data are from the 2014 National Survey on Domestic Violence against Women in Turkey. The optimal bandwidth is estimated by using the Imbens and Kalyanaraman (2009) algorithm. Column 1 reports OLS results using years of schooling as the independent variable for an optimal bandwidth  $\hat{h}$  estimated by the Imbens and Kalyanaraman algorithm. Columns 2 and 3 report reduced-form (RF) RD treatment effects and two-stage least-squares (IV) RD treatment effects (by using treatment as an instrument for years of schooling) of being born after January 1987 with a linear control function in the month-year of birth on each side of the discontinuity. The variables are described in Appendix A. All specifications control for a dummy variable for whether the respondent grew up in a rural location, a dummy variable for whether the respondent's mother tongue is not Turkish, month-of-birth fixed effects, region fixed effects, and interactions of region fixed effects with an indicator of rural regions. Standard errors are clustered at the month-year cohort level. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.



TABLE 5: EFFECTS OF EDUCATION ON DOMESTIC VIOLENCE AND DIVORCE OUTCOMES

	(1) OLS	(2) RF	(3) IV	(4) Bandwidth	(5) N	(6) Mean
Physical violence index	-0.027*** (0.005)	-0.144** (0.065)	-0.207 (0.127)	89	2,321	-0.05
Sexual violence index	-0.022*** (0.004)	-0.106 (0.066)	-0.125 (0.081)	124	3,060	-0.03
Psychological violence index	-0.020*** (0.003)	-0.064 (0.045)	-0.070 (0.049)	144	3,394	0.03
Financial control behavior	-0.015*** (0.005)	0.009 (0.060)	0.013 (0.088)	98	2,443	-0.05
Ever left home	0.002 (0.007)	0.090 (0.072)	0.245 (0.390)	88	648	0.37
Ever divorced	-0.002 (0.001)	-0.011 (0.017)	-0.016 (0.026)	94	2,646	0.05
Second marriage	-0.004*** (0.001)	-0.005 (0.010)	-0.004 (0.009)	157	4,172	0.03

*Notes:* Data are from the 2014 National Survey on Domestic Violence against Women in Turkey. The optimal bandwidth is estimated by using the Imbens and Kalyanaraman (2009) algorithm. Column 1 reports OLS results using years of schooling as the independent variable for an optimal bandwidth  $\hat{h}$  estimated by the Imbens and Kalyanaraman algorithm. Columns 2 and 3 report reduced-form (RF) RD treatment effects and two-stage least-squares (IV) RD treatment effects (by using treatment as an instrument for years of schooling) of being born after January 1987 with a linear control function in the month-year of birth on each side of the discontinuity. The variables are described in Appendix A. All specifications control for a dummy variable for whether the respondent grew up in a rural location, a dummy variable for whether the respondent's mother tongue is not Turkish, month-of-birth fixed effects, region fixed effects, and interactions of region fixed effects with an indicator of rural regions. Standard errors are clustered at the month-year cohort level. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.

## Appendix A List of Variables (For Online Publication)

### Outcome Variables:

- Years of schooling: Number of years of school that the respondent completed.
- Completed Junior High School: A dummy variable equal to one if the respondent completed junior high school or above (i.e., completed at least 8 years of schooling).
- Completed high school: A dummy variable equal to one if the respondent completed high school or above (i.e., completed at least 11 years of schooling).
- Completed primary school: A dummy variable equal to one if the respondent completed primary school or above (i.e., completed at least 5 years of schooling).
- Information about pre-existing laws and services: A set of seven dummy variables, each equal to one if the respondent reported that she has heard a particular pre-existing law or service. These include: (i) men and women have to be at least 17 years old to get married, (ii) it is illegal for parents and other relatives to have their children below the age of 15 married, and is punishable by imprisonment; (iii) it is illegal to have a religious marriage before official marriage; (iv) it is illegal for a man to marry more than one woman; (v) the perpetrator is kept away from the common residence to protect the victims of violence; (vi) the perpetrator is prevented from approaching or contacting the protected victims of violence; and (vii) if the victim's life is in danger, the victim is provided temporary protection services.
- Awareness of pre-existing laws index: A z-score constructed by averaging the z-scores from each of the 7 information indicators, based on dummy variables that equal one if the respondent reports that she has heard about the following pre-existing laws and services: (i) men and women have to be at least 17 years old to get married, (ii) it is illegal for parents and other relatives to have their children below the age of 15 married, and that doing so is punishable by imprisonment; (iii) it is illegal to have a religious marriage before official marriage; (iv) it is illegal for a man to marry more than one woman; (v) the perpetrator is kept away from the common residence to protect the victims of violence; (vi) the perpetrator is prevented from approaching or contacting the protected victims of violence; and (vii) if the victim's life is in danger, the victim is provided temporary protection services.
- Information about new laws and services: A set of nine dummy variables, each equal to one if the respondent reported that she has heard a particular new law or service. These include: (i) it is illegal for a man to have sex with his wife without her consent; (ii) a woman is not required to have her husband's permission to work outside the home; (iii) after spouses get divorced, they share the property that they obtained

during their marriage; (iv) shelters are provided for people who experienced domestic violence and their children; (v) if the perpetrator is addicted to alcohol or drugs, he is provided with diagnosis and treatment opportunities; (vi) the victim of violence is provided with childcare services; (vii) services are provided to victims of violence by the Violence Prevention and Supervision Centers (VPSC); (viii) the victims of violence are provided temporary financial support; and (ix) the perpetrator is prevented from selling the shared home.

- Awareness of new laws index: A z-score constructed by averaging the z-scores from each of the 9 information indicators, based on dummy variables equal to one if the respondent reports that she has heard about the following new laws and services: (i) it is illegal for a man to have sex with his wife without her consent; (ii) a woman is not required to have her husband's permission to work outside the home; (iii) after spouses get divorced, they share the property that they obtained during their marriage; (iv) shelters are provided for people who experienced domestic violence and their children; (v) if the perpetrator is addicted to alcohol or drugs, he is provided with diagnosis and treatment opportunities; (vi) the victim of violence is provided with childcare services; (vii) services are provided to victims of violence by the Violence Prevention and Supervision Centers (VPSC); (viii) the victims of violence are provided temporary financial support; and (ix) the perpetrator is prevented from selling the shared home.
- Heard about new laws from TV index: A z-score constructed by averaging the z-scores from two information indicators, including a dummy variable equal to one if the respondent reports that she has heard about the new laws from TV and a dummy variable equal to one if the respondent reports that she has heard about the new services from TV.
- Heard about new laws from newspapers, journals, or books index: A z-score constructed by averaging the z-scores from two information indicators, including a dummy variable equal to one if the respondent reports that she has heard about the new laws from newspapers, journals, or books and a dummy variable equal to one if the respondent reports that she has heard about the new services from newspapers, journals, or books.
- Heard about new laws from friends and family (social networks) index: A z-score constructed by averaging the z-scores from two information indicators, including a dummy variable equal to one if the respondent reports that she has heard about the new laws from friends and family and a dummy variable equal to one if the respondent reports that she has heard about the new services from friends and family.
- Heard about new laws from formal institutions index: A z-score constructed by averaging the z-scores from six information indicators, based on dummy variables equal

to one if the respondent reports that she has heard about the new laws from public institutions, schools, or non-governmental institutions, and dummy variables equal to one if the respondent reports that she has heard about the new services from public institutions, schools, or non-governmental institutions.

- Physical violence index: A z-score constructed by averaging the z-scores from each of the 6 physical violence indicators, based on dummy variables that equal one if the respondent reports that she experienced intimate partner violence acts of (i) slapping or throwing an object that would hurt; (ii) pushing, shoving, or pulling hair; (iii) hitting with his fist or in a way that hurts; (iv) kicking, pushing on the ground, or beating; and (v) choking or burning.
- Sexual violence index: A z-score constructed by averaging the z-scores from each of the 3 sexual violence indicators, based on dummy variables that equal one if the respondent reports that she experienced intimate partner violence in the form of (i) forced sexual acts, (ii) forced sexual relations because of a fear of what the partner would do otherwise, and (iii) humiliating sexual acts.
- Psychological violence index: A z-score constructed by averaging the z-scores from each of the following indicators, based on dummy variables that equal one if the respondent reports that she experienced intimate partner violence acts of (i) insulting, (ii) humiliating, (iii) scaring or threatening, (iv) attempting to isolate her from her friends, (v) attempting to prevent contact with her family, (vi) insisting on knowing her location, (vii) ignoring her, (viii) becoming angry if she speaks to other men, (ix) suspecting that she is cheating on him, (x) wanting his permission before she seeks healthcare, and (xi) intervening in her clothing choices.
- Financial control index: A z-score constructed by averaging the z-scores from two of the financial control behaviors, including dummy variables that equal one if the respondent reports that she experienced the following behaviors from her intimate partner: (i) taking income from her despite her disapproval and (ii) refusing to give her money for household spending.
- Ever had a relationship: A dummy variable equal to one if the respondent has ever had a relationship (e.g. had a boyfriend, engaged, married).
- Ever married: A dummy variable equal to one if the respondent has ever been married.
- Ever left home: A dummy variable equal to one if the respondent has ever left home. The variable is only available for women who have ever experienced physical violence from their partners.
- Ever divorced: A dummy variable equal to one if the respondent has ever divorced.

- Second marriage: A dummy variable equal to one if the respondent has had a second marriage.
- Gender role and domestic violence attitudes: A set of seven dummy variables, each equal to one if the respondent reported that she agrees with a statement on gender roles or domestic violence. The statements are as follows: (i) a woman should not argue with partner if she disagrees with him; (ii) a woman should be able to spend her money as she wishes; (iii) men can beat their partners in certain situations; (iv) it may be necessary to beat children for discipline; (v) men should also do housework, such as cooking and cleaning; (vi) men in the family are responsible for a woman's behavior; and (vii) it is a woman's duty to have sexual intercourse with her husband.
- Gender attitudes index: A z-score constructed by averaging the z-scores of seven attitude dummy variables, which are calculated by using the mean and standard deviation of the variable. These dummy variables take the value of one if the respondent disagrees with the following statements—a woman should not argue with her partner if she disagrees with him; men can beat their partners in certain situations; it may be necessary to beat children for discipline; men in the family are responsible for a woman's behavior; and it is a woman's duty to have sexual intercourse with her husband—and if the respondent agrees with the following statements—a woman should be able to spend her money as she wishes, and men should also do housework, including cooking and cleaning.
- Employed: A dummy variable equal to one if the respondent was employed last week.
- Employed in services: A dummy variable equal to one if the respondent was employed in services last week.
- Social security: A dummy variable equal to one if the respondent had social security benefits from her job last week.
- Personal income index: A z-score constructed by averaging the z-scores of the income dummy variables, which are calculated by using the mean and standard deviation of the variable. These dummy variables take the value of one if the respondent earns a personal income from the following six sources: rent from owning land, rent from owning a house, income from owning a company or workplace, income from owning a vehicle, having money in the bank, and income from other asset ownership.
- Asset ownership index: A z-score constructed by averaging the z-scores of the asset ownership dummy variables, which are calculated by using the mean and standard deviation of the variable. These dummy variables take the value of one if the

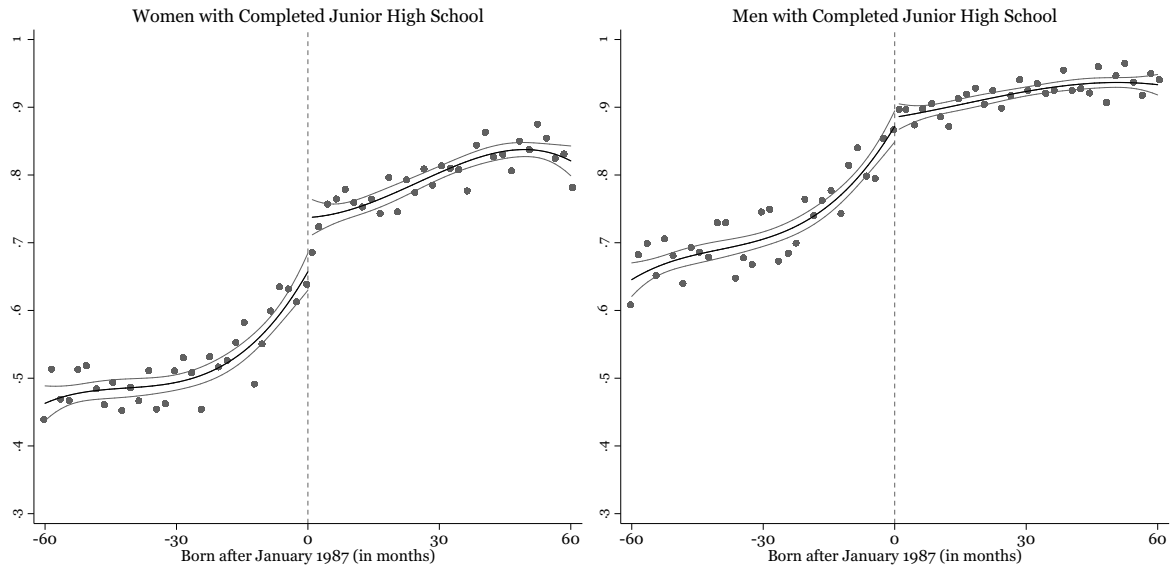
respondent's household owns the asset. The following assets are included: refrigerator, deep freezer, gas/electric oven, microwave oven, dishwasher, garbage dispenser, washing machine, drying machine, iron, vacuum cleaner, plasma TV (LCD), home theater, television, satellite TV, paid TV service, DVD/VCD player, cellphone, non-mobile telephone, laptop/tablet computer, desktop computer, internet, air conditioner, car, taxi/mini-bus/bus or other commercial vehicles, and tractor.

**Covariates:**

- Non-Turkish Speaker: A dummy variable equal to one if the respondent speaks a non-Turkish language as her primary language.
- Childhood region, rural: A dummy variable equal to one if the respondent lived in a rural village or district until she was 12 years old.
- Region dummies: Dummy variables for each of the 12 regions where the respondents lived until they were 12 years old.

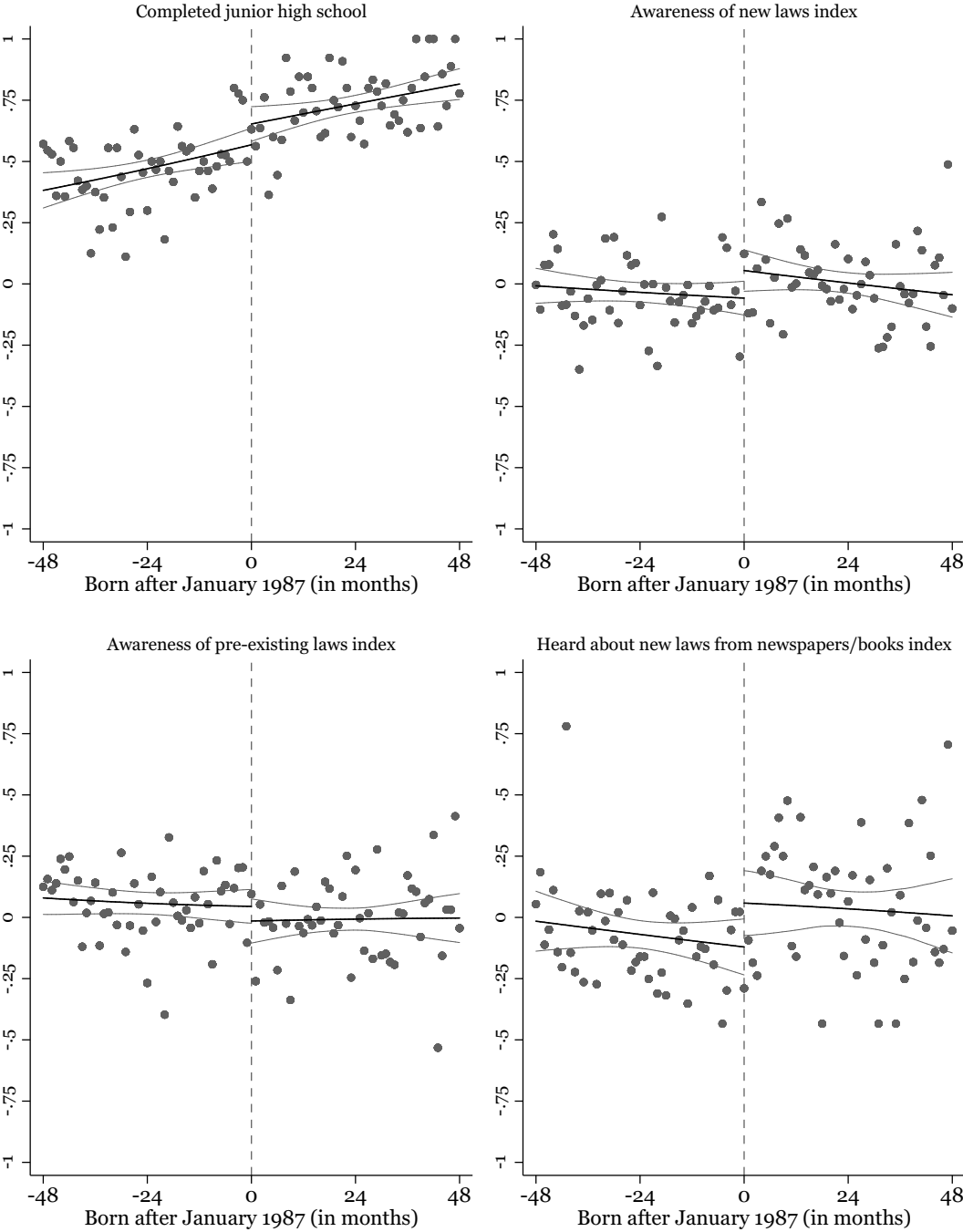
## Appendix B Additional Figures and Tables (For Online Publication)

FIGURE A1: RD TREATMENT EFFECTS ON JUNIOR HIGH SCHOOL COMPLETION



*Note:* Data are from the 2014 Household Labor Force Survey. Figures plot junior high school completion rates in monthly bins for women on the left and men on the right. Gray lines show 95 percent confidence intervals around the mean level.

FIGURE A2: RD TREATMENT EFFECTS ON JUNIOR HIGH SCHOOL COMPLETION, INFORMATION ABOUT LAWS, AND THEIR SOURCES



*Note:* Data are from the 2014 National Survey on Domestic Violence against Women in Turkey. Figures plot junior high school completion, awareness of new laws index, awareness of pre-existing laws index, and having heard about the new laws from newspapers/books index in monthly bins using a bandwidth of 48 months around the discontinuity. Gray lines show 95 percent confidence intervals around the mean level.



TABLE A1: RD TREATMENT EFFECTS ON COVARIATES AND RELATIONSHIP STATUS

	(1)	(2)	(3)
Outcome / statistic	Linear RD	Bandwidth	N
Childhood region:			
West	0.032 (0.044)	113	3,206
South	-0.028 (0.027)	140	3,900
Central	0.020 (0.026)	123	3,482
North	-0.044* (0.023)	157	4,223
East	0.031 (0.034)	106	2,992
Rural	-0.061 (0.044)	98	2,769
Non-Turkish speaker	0.005 (0.006)	138	3,823
Joint p-value	0.285		
Ever had a relationship	-0.003 (0.021)	68	1,909
Ever married	0.002 (0.031)	88	2,508

*Notes:* Data are from the 2014 National Survey on Domestic Violence against Women in Turkey. Column 1 reports reduced-form RD treatment effects of being born after January 1987 using an optimal bandwidth  $\hat{h}$  estimated by the Imbens and Kalyanaraman (2009) algorithm, with a linear control function in the month-year of birth on each side of the discontinuity. Column 2 reports the bandwidth, and column 3 reports the number of observations. The first seven variables are predetermined covariates, and the last two are relationship status. In particular, in the first seven rows of dependent variables are dummy variables equal to 1 if the respondent lived in western, southern, central, northern, eastern, or rural Turkey until the age of 12, respectively, and a dummy variable equal to one if the respondent's interview language was not Turkish. The relationship status variables include a dummy variable equal to one if the respondent had ever had a relationship and a dummy variable equal to one if the respondent had ever been married. The row entitled "joint p-value" provides the p-value from a SUR test of joint significance of the covariates in columns 1 to 7. Standard errors are clustered at the month-year cohort level. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.

TABLE A2: EFFECTS OF EDUCATION ON GENDER ATTITUDES

	(1) OLS	(2) RF	(3) IV	(4) Bandwidth	(5) N	(6) Mean
A woman should not argue with partner if she disagrees with him.	-0.035*** (0.003)	-0.012 (0.042)	-0.014 (0.050)	119	3,276	0.35
A woman should be able to spend her money as she wills.	0.015*** (0.002)	-0.018 (0.034)	-0.016 (0.032)	137	3,726	0.7
Men can beat their partners in certain situations.	-0.025*** (0.003)	0.016 (0.041)	0.016 (0.041)	107	2,847	0.35
It may be necessary to beat children for discipline.	-0.019*** (0.002)	-0.012 (0.031)	-0.014 (0.037)	117	3,227	0.24
Men should also do housework, e.g. cooking and cleaning.	0.025*** (0.002)	-0.029 (0.035)	-0.034 (0.046)	105	2,937	0.74
Men in the family are responsible for a woman's behavior	-0.031*** (0.002)	0.012 (0.036)	0.014 (0.044)	122	3,337	0.36
It is a woman's duty to have sexual intercourse with her husband.	-0.003*** (0.001)	-0.012 (0.010)	-0.014 (0.012)	119	3,306	0.02
Gender attitudes index	0.048*** (0.002)	-0.007 (0.038)	-0.009 (0.046)	120	3,331	0.06

*Notes:* Data are from the 2014 National Survey on Domestic Violence against Women in Turkey. The optimal bandwidth is estimated by using the Imbens and Kalyanaraman (2009) algorithm. Column 1 reports OLS results using years of schooling as the independent variable for an optimal bandwidth  $\hat{h}$  estimated by the Imbens and Kalyanaraman algorithm. Columns 2 and 3 report reduced-form (RF) RD treatment effects and two-stage least-squares (IV) RD treatment effects (by using treatment as an instrument for years of schooling) of being born after January 1987 with a linear control function in the month-year of birth on each side of the discontinuity. The variables are described in Appendix A. All specifications control for a dummy variable for whether the respondent grew up in a rural location, a dummy variable for whether the respondent's mother tongue is not Turkish, month-of-birth fixed effects, region fixed effects, and interactions of region fixed effects with an indicator of rural regions. Standard errors are clustered at the month-year cohort level. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.

TABLE A3: EFFECTS OF EDUCATION ON INFORMATION ABOUT LAWS AND THEIR SOURCES USING A STATIC BANDWIDTH

	(1) OLS	(2) RF	(3) IV	(4) Bandwidth	(5) N	(6) Mean
Years of schooling		0.835*** (0.286)		118	3,276	8.49
Awareness of pre-existing laws index	0.023*** (0.003)	-0.026 (0.036)	-0.031 (0.046)	118	3,276	0.03
Awareness of new laws index	0.013*** (0.003)	0.114*** (0.039)	0.137** (0.058)	118	3,276	0.00
Heard about the new laws from TV index	0.000 (0.005)	-0.057 (0.057)	-0.068 (0.074)	118	3,276	-0.01
Heard about the new laws from newspapers, journals, or books index	0.079*** (0.005)	0.121* (0.069)	0.145* (0.087)	118	3,276	0.05
Heard about the new laws from friends and family index	-0.019*** (0.005)	-0.035 (0.067)	-0.041 (0.080)	118	3,276	0.01
Heard about the new laws from formal institutions index	0.039*** (0.004)	-0.014 (0.036)	-0.016 (0.045)	118	3,276	0.02
Physical violence index	-0.029*** (0.005)	-0.100* (0.059)	-0.128 (0.087)	118	2,927	-0.04
Ever left home	-0.001 (0.006)	0.077 (0.065)	0.239 (0.405)	118	833	0.36
Ever divorced	-0.003** (0.001)	-0.001 (0.016)	-0.001 (0.019)	118	3,276	0.06
Second marriage	-0.004*** (0.001)	0.000 (0.012)	0.000 (0.014)	118	3,276	0.03

Notes: Data are from the 2014 National Survey on Domestic Violence against Women in Turkey. The bandwidth is 118 months in all regressions, which is the optimal bandwidth  $\hat{h}$  estimated by the Imbens and Kalyanaraman (2009) algorithm when completion of junior high school is the independent variable. Column 1 reports OLS results using years of schooling as the independent variable. Columns 2 and 3 report reduced-form (RF) RD treatment effects and two-stage least-squares (IV) RD treatment effects (by using treatment as an instrument for years of schooling) of being born after January 1987 with a linear control function in the month-year of birth on each side of the discontinuity. The variables are described in Appendix A. All specifications control for a dummy variable for whether the respondent grew up in a rural location, a dummy variable for whether the respondent's mother tongue is not Turkish, month-of-birth fixed effects, region fixed effects, and interactions of region fixed effects with an indicator of rural regions. Standard errors are clustered at the month-year cohort level. Standard errors are clustered at the month-year cohort level. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.

TABLE A4: EFFECTS OF EDUCATION ON INFORMATION ABOUT LAWS AND THEIR SOURCES USING A QUADRATIC CONTROL FUNCTION

	(1) OLS	(2) RF	(3) IV	(4) Bandwidth	(5) N	(6) Mean
Schooling		0.694** (0.331)		89	2,492	8.48
Awareness about pre-existing laws index	0.023*** (0.003)	-0.024 (0.035)	-0.024 (0.036)	131	3,630	0.02
Awareness about new laws index	0.012*** (0.003)	0.112*** (0.036)	0.102*** (0.038)	137	3,765	-0.01
Heard about the new laws from TV index	-0.000 (0.005)	-0.035 (0.058)	-0.046 (0.079)	114	3,165	-0.01
Heard about the new laws from newspaper, journals, or books index	0.079*** (0.005)	0.135* (0.069)	0.161* (0.089)	116	3,250	0.05
Heard about the new laws from friends and family index	-0.018*** (0.005)	-0.029 (0.063)	-0.028 (0.060)	134	3,709	0.01
Heard about the new laws from formal institutions index	0.039*** (0.004)	-0.028 (0.037)	-0.033 (0.047)	120	3,331	0.02
Physical violence index	-0.027*** (0.005)	-0.144** (0.065)	-0.209 (0.130)	89	2,321	-0.05
Ever left home	0.002 (0.007)	0.093 (0.073)	0.240 (0.365)	88	648	0.37
Ever divorced	-0.002 (0.001)	-0.012 (0.017)	-0.017 (0.027)	94	2,646	0.05
Second marriage	-0.004*** (0.001)	-0.005 (0.010)	-0.004 (0.008)	157	4,172	0.03

Notes: Data are from the 2014 National Survey on Domestic Violence against Women in Turkey. The optimal bandwidth is estimated by using the Imbens and Kalyanaraman (2009) algorithm. Column 1 reports OLS results using years of schooling as the independent variable for an optimal bandwidth  $\hat{h}$  estimated by the Imbens and Kalyanaraman algorithm. Columns 2 and 3 report reduced-form (RF) RD treatment effects and two-stage least-squares (IV) RD treatment effects (by using treatment as an instrument for years of schooling) of being born after January 1987 with a linear control function in the month-year of birth on each side of the discontinuity. The variables are described in Appendix A. All specifications control for a dummy variable for whether the respondent grew up in a rural location, a dummy variable for whether the respondent's mother tongue is not Turkish, month-of-birth fixed effects, region fixed effects, and interactions of region fixed effects with an indicator of rural regions. Standard errors are clustered at the month-year cohort level. Standard errors are clustered at the month-year cohort level. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.

TABLE A5: EFFECTS OF EDUCATION ON INFORMATION ABOUT LAWS AND THEIR SOURCES FOCUSING ON WOMEN RAISED IN RURAL REGIONS

	(1) OLS	(2) RF	(3) IV	(4) Bandwidth	(5) N	(6) Mean
Schooling		1.134** (0.451)		85	1,396	7.42
Awareness about pre-existing laws index	0.023*** (0.004)	-0.045 (0.056)	-0.035 (0.045)	121	1,951	-0.01
Awareness about new laws index	0.012*** (0.004)	0.090* (0.052)	0.062* (0.037)	154	2,353	-0.04
Heard about the new laws from TV index	0.001 (0.007)	0.049 (0.081)	0.036 (0.060)	140	2,187	-0.02
Heard about the new laws from newspaper, journals, or books index	0.076*** (0.006)	0.049 (0.072)	0.033 (0.048)	153	2,339	-0.05
Heard about the new laws from friends and family index	-0.013** (0.006)	-0.052 (0.084)	-0.036 (0.058)	155	2,353	0.01
Heard about the new laws from formal institutions index	0.035*** (0.005)	-0.118** (0.048)	-0.118 (0.073)	93	1,528	-0.02
Physical violence index	-0.028*** (0.005)	-0.104 (0.073)	-0.084 (0.065)	119	1,734	-0.03
Ever left home	-0.004 (0.009)	0.061 (0.097)	0.324 (1.386)	72	321	0.37
Ever divorced	-0.004*** (0.001)	-0.008 (0.019)	-0.007 (0.018)	114	1,850	0.05
Second marriage	-0.004*** (0.001)	-0.017 (0.016)	-0.012 (0.013)	142	2,207	0.03

*Notes:* Data are from the 2014 National Survey on Domestic Violence against Women in Turkey. The sample is restricted to women raised in rural regions. The optimal bandwidth is estimated by using the Imbens and Kalyanaraman (2009) algorithm. Column 1 reports OLS results using years of schooling as the independent variable for an optimal bandwidth  $\hat{h}$  estimated by the Imbens and Kalyanaraman algorithm. Columns 2 and 3 report reduced-form (RF) RD treatment effects and two-stage least-squares (IV) RD treatment effects (by using treatment as an instrument for years of schooling) of being born after January 1987 with a linear control function in the month-year of birth on each side of the discontinuity. The variables are described in Appendix A. All specifications control for a dummy variable for whether the respondent grew up in a rural location, a dummy variable for whether the respondent's mother tongue is not Turkish, month-of-birth fixed effects, region fixed effects, and interactions of region fixed effects with an indicator of rural regions. Standard errors are clustered at the month-year cohort level. Standard errors are clustered at the month-year cohort level. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.

TABLE A6: EFFECTS OF EDUCATION ON LABOR MARKET OUTCOMES

	(1) OLS	(2) RF	(3) IV	(4) Bandwidth	(5) N	(6) Mean
Employed	0.021*** (0.002)	0.013 (0.027)	0.012 (0.023)	198	0.24	4,675
Employed in services	0.028*** (0.002)	0.014 (0.029)	0.012 (0.024)	143	0.18	3,905
Social security	0.029*** (0.002)	0.007 (0.025)	0.006 (0.023)	136	0.15	3,731
Personal income index	0.020*** (0.003)	-0.061 (0.040)	-0.080 (0.068)	99	-0.06	2,793
Asset ownership index	0.016* (0.008)	0.056 (0.050)	0.068 (0.065)	74	0.06	2,056

*Notes:* Data are from the 2014 National Survey on Domestic Violence against Women in Turkey. The optimal bandwidth is estimated by using the Imbens and Kalyanaraman (2009) algorithm. Column 1 reports OLS results using years of schooling as the independent variable for an optimal bandwidth  $\hat{h}$  estimated by the Imbens and Kalyanaraman algorithm. Columns 2 and 3 report reduced-form (RF) RD treatment effects and two-stage least-squares (IV) RD treatment effects (by using treatment as an instrument for years of schooling) of being born after January 1987 with a linear control function in the month-year of birth on each side of the discontinuity. The variables are described in Appendix A. All specifications control for a dummy variable for whether the respondent grew up in a rural location, a dummy variable for whether the respondent's mother tongue is not Turkish, month-of-birth fixed effects, region fixed effects, and interactions of region fixed effects with an indicator of rural regions. Standard errors are clustered at the month-year cohort level. Standard errors are clustered at the month-year cohort level. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.