Religion and Abortion: The Role of Politician Identity*

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Abstract

Debates around abortion typically invoke religion and politics but there is no causal evidence of the impact of politician religion on abortion. Leveraging quasi-random variation in politician religion generated by close elections in India and controlling for the party affiliation of politicians, we find lower rates of sex-selective abortion in districts won by Muslim state legislators, consistent with a higher reported aversion to abortion among Muslims compared to Hindus. The competing hypothesis that this reflects weaker son preference among Muslims is undermined by stated preference data and by demonstrating that fertility and girl-biased infant mortality increase in Muslim-won districts.

JEL codes: I15, J13, O15, P16
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1. Introduction

Debates surrounding abortion often invoke both religion and politics. Yet, there appears to be no research that establishes a causal link between politician preferences and abortion outcomes. We examine whether the personal religious identity of state legislators in India influences abortion rates in the districts in which they are elected, controlling for their party affiliation. Our focus is on sex-selective abortion because this has dramatically increased in recent decades and, while access to safe abortion can be viewed as part of women's rights, sex-selective abortion is a marker of discrimination against women and girls. In addition to the violation involved in killing girls before birth, sex-selective abortion is often harmful to women's health because the procedures and facilities used are unsafe. Although abortion was legalized in India in 1971, illegal abortion is easily accessed and outweighs legal abortion by a factor of 8 to 11 (Jesani and Iyer, 1993).

Women constituted only 48.5% of India's population in the 2011 census, compared to 50.8% in the United States. India's Economic Survey of 2017-2018 estimated that 63 million women are "missing" from the population, highlighting this as one of the most pressing problems facing the country. A male-biased population sex ratios potentially have long-term consequences for the prevalence of prostitution and sexually transmitted infections, crime and violence, labor markets and old-age care (Samuelson, 1985; Angrist, 2002; Ebenstein and Sharygin, 2009; Edlund et al., 2013; Amaral and Bhalotra, 2017). It reflects son preference in fertility, which Indians have exhibited for centuries (Visaria, 1967; Bhaskar and Gupta, 2007). Historically, families achieved this by continuing fertility till they had at least one surviving son (Clark, 2000; Bhalotra and van Soest, 2008; Filmer et al., 2009; Rosenblum, 2013) and by concentrating resources including nutrition and immunization on boys, while "allowing girls to die" (Sen, 1992; Klasen, 1994; Anderson and Ray, 2010). The advent of technologies that allow prenatal sex detection has led to sex-selective abortion being used an alternative mechanism (Bhalotra and Cochrane, 2010). Today, sex-selective abortion, son-biased fertility stopping and infant mortality of girls relative to boys are intricately related manifestations of son preference. A key point in this study is that only one of these involves abortion.

The sex ratio at birth in India has grown more male-biased since the mid to late 1980s despite rapid increases in income, improvements in women's education, a decline in stated son preference, and the implementation of a ban on prenatal sex determination in 1996. One possible explanation for the unabated rise in sex-selective abortion is insufficient political commitment which, in turn, may be a function of politician identity. We begin by documenting differences in preferences over abortion by religion in India. In particular, Muslims have stronger stated preferences against abortion than Hindus, but similar levels of son preference.[1]

We investigate the hypothesis that Muslim legislators, acting on their preferences, are more effective at reducing abortion than Hindus. To do this, we use nationwide survey data on the retrospective fertility histories of more than 450,000 women with more than 860,000 births over three decades. Our main outcome variable is the share of births that is female, a widely used marker of sex-selective abortion (Almond and Edlund, 2008; Bhalotra and Cochrane, 2010; Almond et al., 2019) that provides more objective information than self-reports of abortion. Since electoral data in India do not identify candidate religion, we created a novel data base containing the religious identity of all candidates for state assembly elections in India during 1979-2010, coding religion from name (Bhalotra et al., 2014).

[1] Elicited preferences in the World Values Survey data for India reveal that Muslim respondents are between 7.2 and 12.5 percentage points less likely than non-Muslims in India (who are predominantly Hindus) to agree that abortion is acceptable under conditions such as that the mother's health is at risk, the mother is unmarried or that the child is likely to be physically handicapped.

We face two identification challenges. First, the election of a Muslim rather than a non-Muslim politician is potentially correlated with the outcome of interest. To address this, we use the sample of close elections between Muslims and non-Muslims leveraging the fact that, in first-past-the-post elections, there is a sharp discontinuity in the chances of winning when the vote share difference between the top two vote-winners is small, as a result of which the identity of the winner can be considered quasi-random. A standard regression discontinuity design (RDD) would involve comparing constituency-level outcomes across constituencies in which Muslims narrowly won vs narrowly lost against non-Muslims. However, our survey data identify only the administrative district and not the electoral constituency of respondents and so we match district-year electoral data to individual birth outcomes. To do this, we aggregate over all constituency-specific discontinuities within a district and use an instrumental variables procedure similar to a fuzzy-RDD (Cunningham, 2021).[2] We provide tests of the underlying RDD assumptions, showing continuity across the RD threshold for a rich set of demographic and electoral characteristics and that there is no evidence of manipulation at the threshold.

The second identification issue arises from the possibility that the treatment (Muslim legislator wins, rather than non-Muslim) affects the outcome (sex ratio at birth) through channels other than sex-selective abortion. We address this problem by leveraging the fact that families do not attempt sex-selective abortion for first births. This has been documented extensively not only for India (Das Gupta and Bhat 1997; Visaria 2005; Bhalotra and Cochrane, 2010; Anukriti et al., 2021) but also for China (Chen et al., 2013) and among Asian immigrants in America and Canada

[2] A similar fuzzy RDD approach is taken in Bhalotra and Clots-Figueras (2014). Standard or sharp regression discontinuity designs based on close elections have been used, among others, by Lee (2008) to study incumbency advantage; Pettersson-Lidbom (2008) to examine the effect of party control on fiscal policies; Lee, Moretti and Butler (2004) to examine the effect of party identity on legislators' voting behaviour; Bhalotra, Clots-Figueras and Iyer (2018) to study the impact of women's electoral victories on subsequent women's political participation and Baskaran and Hessami (2019) to study the impact of women leaders on economic growth and infrastructure.

(Almond and Edlund, 2008; Almond et al. 2013). We obtain results for higher birth orders differencing with respect to first births, which purges all impacts of legislator religion that are common across birth order. Our main specification controls for district, birth cohort and birth order fixed effects and for the party identity of politicians and we also show that the results are robust to inclusion of state-year fixed effects and district-specific time trends.

Our main finding, in line with our hypothesis, is that sex-selective abortion is lower in districts with a Muslim legislator. We estimate that the election of one additional Muslim legislator in a district leads to a statistically significant increase of 0.7 percentage points in the probability that a birth is a girl at birth orders three or higher. The birth order pattern is consistent with previous work showing that sex selective abortion is increasing in birth order, being effectively zero at first birth and most evident at third births or higher. The impact of legislator religion is larger in non-Muslim (mostly Hindu and Sikh) families, and among families where the first child is a girl, consistent with earlier studies that show these families are more likely to practice sex selective abortion (Bhalotra and Cochrane, 2010). It is striking that minority group leaders are able to make a discernible difference to behaviors concentrated among the majority group.

The main alternative to our hypothesis that abortion preferences explain these results is that Muslims have weaker son preference. We show that there is no evidence of this in stated preferences for sons. We investigate this formally, using the same identification strategy to estimate the impact of legislator religion on fertility since continuation of fertility has been shown to be a substitute for sex-selective abortion as a means of achieving the desired gender mix of children (Clark, 2000; Gangadharan and Maitra, 2003; Bhalotra and van Soest, 2008; Almond et al., 2013; Rosenblum, 2013; Anukriti et al., 2021). We find that, in districts won by Muslim legislators, there is an increase in the probability of a third or higher order birth. Breaking this down, we see an increase in the chances of a third birth of about 1.04 percentage points which is (statistically) similar to the increase in the probability that a girl child is born, making it plausible that this is a mechanical reflection of the reduction in girl abortion. There is a further increase in fertility at birth order four and above, consistent with families continuing fertility in the hope of achieving a(nother) son.

We also investigate changes in behavior at a third margin available to families to adjust the sex composition of their children, namely selective neglect after birth. Previous research shows that this was an important determinant of the historically higher rates of child mortality among girls in India (Sen, 1992; Oster, 2009). We find that the share of girls in neonatal and infant deaths is higher in districts with Muslim legislators. This is consistent with the Anukriti et al. (2021), who show that Indian families are substituting prenatal for postnatal selection of girls over time and back this with analysis of investments in breastfeeding and immunization. Our result here shows that this also acts in reverse i.e. when prenatal selection is reduced by the presence of Muslim legislators, then parents compensate by being more likely to neglect girls after birth. These results make it unlikely that Muslim legislators are acting on son preference, while being consistent with their acting on abortion preferences.

To investigate the possibility that the results are driven by pro-female preferences that are not captured by son preference in fertility, we examined whether the election of Muslim legislators changes crimes against women, and find it does not. Since women legislators have been shown to be more likely to favor pro-female policies (Clots-Figueras 2012; Bhalotra, Fernandez and Slapin, 2018; Baskaran et al., 2020; Lippman 2020), we benchmark our findings against the impact of women legislators, using a similar design leveraging close elections between men and women. We find that women legislators have no significant impact on sex-selective abortion or the infant mortality of girls relative to boys, but that their presence results in a significant decline in the probability of a third-order birth. The results for women are consistent with the stylized facts that women have son preference and desire lower fertility than men (Ashraf et al., 2014), and they contrast with the results for Muslim legislators.

Legislators can exert their preferences through formal channels such as passing legislation, monitoring adherence to existing legislation or directing resources to specific causes or, alternatively, through informal channels including deliberation, making issues they care about salient or providing information to citizens. In terms of formal channels, our results are robust to the inclusion of state-year fixed effects, suggesting that state-level legislation is not the primary mechanism. We find suggestive evidence that the impact of legislator religion on the birth sex ratio is higher shortly after the enactment of the federal Pre-Conception and Pre-Natal Diagnostic Techniques (PC&PNDT) Act that banned prenatal sex determination. This is consistent with the federal law providing Muslim legislators with a tool with which to achieve lower abortion rates, though this need not be the only or the main channel of their influence. We could not identify systematic data on enforcement over time and across districts, nor on expenditures relevant to abortion reduction.

Informal mechanisms of salience and information are difficult to measure but our findings are broadly coherent with research that finds leader effects on fertility in circumstances where the leaders *did* nothing to influence it. Bassi and Rasul (2017) show that persuasive messages in the Pope's speeches during a visit to Brazil led to reductions in contraceptive use of more than 40% and a 1.6% increase in fertility nine months later. Even if leaders do nothing, citizen reactions to leader identity can change individual behavior. Dahl et al. (2021) show that economic optimism led to higher fertility in Republican relative to Democratic districts following the election of

Donald Trump, the differences being sizeable at 1.1 to 2.6 percentage points. Using a lab-in-field experiment in India in which groups are assigned to either Muslim or Hindu leaders, Bhalotra et al. (2021) demonstrate that citizen behavior varies with leader identity, even after controlling for the actions of leaders. Beaman et al. (2009) show that quotas for women in local government lead to higher aspirations and increased educational attainment for girls.

Our paper brings together two major strands of research. The first is a literature on the determinants of population sex ratios that has emphasized demographic determinants such as declining fertility (Das Gupta and Mari Bhat, 1997; Bhalotra and Cochrane, 2010; Ebenstein, 2010; Jayachandran, 2017; Anukriti, 2018), economic determinants such as land reform and dowry prices (Almond et al., 2019; Bhalotra et al., 2019; Bhalotra et al., 2020a) or institutional determinants such as female inheritance rights (Jain, 2014; Bhalotra et al., 2020b). Although sex-selective abortion involves abortion, previous work has viewed it through the lens of son preference and not through the lens of abortion. No previous work, in India, or elsewhere, examines the influence of politician religion on abortion rates in the districts they are elected from.[3] In view of widespread international debate and media coverage linking abortion to religion, this is a striking omission.

The second is a literature on the substantive impacts of politician identity.[4] Most empirical papers have focused on the gender or ethnic identity of leaders and examined provision of public

[3] A literature on developed countries has linked abortion with politics and religion but has mostly focused on describing the preferences of different religious groups towards abortion (see, among others, Harris and Mill, 1985; Cook et al., 1992; Clements, 2015). The abortion debate in the United States has focused on party politics more than on the religion of the individual legislator.

[4] In the classical Downsian model, the preferences of politicians do not matter, and policy is determined by the preferences of the median voter (Downs, 1957). More recent models have modified and extended this framework to allow for the role of politician preferences (e.g. Besley and Coate, 1997). Many empirical papers have shown that women leaders prioritize pro-woman and pro-child policies (Chattopadhyay and Duflo, 2004; Clots-Figueras, 2011, 2012; Iyer et al., 2012; Bhalotra and Clots-Figueras, 2014; Brollo and Troiano, 2016). The evidence on politicians' ethnic identity is more mixed, with some studies finding that leaders preferentially transfer state resources to their co-

goods or outcomes like infant mortality that are closely tied to public goods provision. Our results are novel in showing that the religious identity of political leaders can influence household behavior with regard to fertility and abortion. Importantly, they provide compelling and rare evidence that minority group legislators can influence the behavior of the majority group. The only other paper we are aware of that investigates the effects of politician religion is Bhalotra et al. (2014),[5] who are motivated by whether leaders target broad-based public services toward their own group, a question that has previously been asked with respect to caste in India (Pande, 2003) and ethnicity in Africa (Burgess et al., 2015).[6] As the vast majority of Indian legislators are Hindus, our finding that Muslim legislators reduce sex-selective abortion suggests that weak political preferences contribute to the persistence of this problem. However, our findings of higher fertility and postnatal excess girl mortality at higher birth orders demonstrate that changing practices is easier than changing preferences.

The rest of the paper is organized as follows: Section 2 describes gender outcomes and the political environment in India. Sections 3 and 4 describe our data and empirical strategy. Section 5 presents our results, Section 6 discusses possible mechanisms and Section 7 concludes.

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ethnics (Pande, 2003; Besley et al., 2012; Burgess et al., 2015; Kramon and Posner, 2016), but others finding no evidence of this (Kudamatsu, 2009; Dunning and Nilekani, 2013).

[5] There is relatively little empirical research examining the substantive impact of religious identity and even less examining its impact on gender outcomes. Meyersson (2014) examines girls' education under the Islamist party in Turkey focusing upon party whereas we focus upon the personal religious identity of politicians after controlling for party identity.

[6] Using infant mortality and education outcomes as proxies for the effective provision of public goods, Bhalotra et al. (2014) find that these outcomes are better under Muslim leaders than non-Muslims. Importantly, the improvements are of a broadly similar magnitude in Hindu and Muslim families.

2. **Abortion, Religion and Politics in India**

2.1. Gender and abortion in India

We noted earlier that it is estimated that 63 million women are "missing" in India. In addition, it is estimated that a further 21 million "unwanted girls" are born in the parental quest for a son (Government of India, 2018), many of whom die early and unnecessarily. Male-biased sex ratios were noted as early as the first census in 1871 (Visaria, 1967), and female infanticide was thought to have been the major contributor (Dickemann, 1979). Decades of economic development have not rectified this imbalance, indeed the all-age ratio of males to females has drifted upwards through the twentieth century (Bhaskar and Gupta, 2007). A more recent phenomenon, which motivates our study, is that the fraction of females at birth has declined sharply since the 1981 census, even as the all-age sex ratio has stabilized in the most recent censuses (see Figure 1, panel A).[7] A major contributing factor to this trend has been the introduction of affordable prenatal sex detection technology that has facilitated sex-selective abortion. The decline in the female share of births is particularly pronounced at higher birth orders and among families that do not already have boys at previous birth orders; there is no discernible tendency to sex-select at first birth (see Figure 1, panel B).

Abortion was legalized in India with the passage of the Medical Termination of Pregnancy (MTP) Act in 1971, which became effective in most states in 1972. The 1971 Act provides for legal abortion under specified conditions in the first twenty weeks of pregnancy. In order to improve women's access to legal and safe abortion, the MTP Act was amended in 2003 and again in 2021. Legal protection now extends, under specified conditions, to abortion within 24 weeks of

[7] There is a biological tendency for the sex ratio at birth to be biased in favor of boys, with more boys being born and more dying before reproductive age, with most of this adjustment being in the first five years of life (Fisher, 1930). However, the sex ratio at birth in India is unnaturally skewed in favor of boys.

conception and to unmarried women. Despite this, abortion is often harmful to women's health because the procedures and facilities used are unsafe; illegal abortion is easily accessed and outweighs legal abortion by a factor of 8 to 11 (Jesani and Iyer, 1993).

In response to civil society protests against widespread female foeticide, the Government of India passed the Pre-Conception and Pre-Natal Diagnostic Techniques (PC&PNDT) Act in 1994. This legislation made it an offence to conduct prenatal sex detection, and imposed penalties on both citizens and medical providers for violating the guidelines. While there is some evidence that the Act had an impact on gender ratios (Nandi and Deolalikar, 2013), this has not been large enough to reverse the overall decline in sex ratios at birth. More recently, the Government of India has pushed for the importance of the empowerment of women girls, implementing programs such as "Beti Bachao, Beti Padhao" ("save daughters, educate daughters") in 2015, which includes campaigns targeted to reduce and eliminate female foeticide (Dasgupta and Sharma 2021).

2.2. Muslims and politics in India

India is a country of considerable religious diversity and the constitution enshrines secularism by conferring the fundamental right to freely "profess, practice and propagate religion." Muslims form the single largest religious minority in India, constituting 14.2% of the population in the 2011 census. Hindus are the religious majority, constituting 79.8% of the population. With 172 million Muslims in 2011, India had the third largest Muslim population in the world. Muslims in India are more likely to live in urban areas (36% compared to 28% of Hindus), and their population share varies substantially across states and across districts within states. They are, on average, poorer than Hindus: 31% of Muslims were below the poverty line in 2004-05, much higher than the figure of 21% for upper-caste Hindus and comparable to the figure of 35% for lower castes (Government of India, 2006). Using our purpose-built data on the religion of Indian state legislators, we find that only 5.6% of electoral constituencies in a district were won by Muslims over the period 1979-2010, substantially lower than their population share.

India is a federal country in which the constitution grants substantial policy autonomy to the 29 states. Indian states largely determine their own health and education budgets, although they receive supplementary funds from federal programs, and the federal government can also pass some health-related legislation. State legislators can shape outcomes in their districts in many ways. For example, they can spend discretionary funds on local public works (Keefer and Khemani, 2009), or influence federally funded development programs, such as the public works program NREGA (Gupta and Mukhopadhyay, 2014) or the effective implementation of policies and the supply of public services (Baskaran et al., 2015; Min, 2015). Elections to state legislatures are held every five years on a first-past-the-post basis in single-member constituencies. Explicitly Islamic parties win very few elections in India, but among the national and prominent regional parties, some parties appeal more to Hindus than to Muslims. While India has political quotas for low castes in state assemblies and local governments, there are no political quotas for Muslims.[8]

2.3. Abortion and gender preferences by religion

Islam places a high priority on the sanctity of life, and this principle leads all schools of Islam to oppose abortion after the first 120 days of pregnancy. Views differ across different schools and scholars on the acceptability of abortion before this stage, with many scholars holding the view that life begins at conception. Infanticide is also severely discouraged. Previous research has shown that infant mortality rates are lower for Muslim children compared to Hindus, despite Muslims being poorer and less educated (Bhalotra, Valente and van Soest, 2010), and that Muslim

[8] Jensenius (2013) discusses the historical reasons underlying the absence of electoral quotas for Muslims.

families are less likely than Hindu and Sikh families to commit sex-selective abortion (Almond et al., 2013; Bhalotra and Cochrane, 2010). Using the World Values Survey data for India, we find that even after controlling for age, gender, education and wealth, Muslim respondents are significantly less likely to agree that abortion is acceptable under a range of scenarios (Table 1, columns 1-4). For instance, while 69% of Hindus agree that abortion is acceptable if the child is handicapped, the fraction is 12.5 percentage points lower for Muslim respondents.

We find no evidence that Muslims have lower son preferences than non-Muslims. The NFHS data we use show that Muslims report a desire for more sons and more daughters (higher desired fertility) but the desired *share* of boys among all children is similar and just slightly higher among Muslim families (Table 1, columns 5-7). Using data from the World Values Surveys for India, we find that Muslims are significantly less likely to agree with the statement "both the husband and wife should contribute to household income," but no more likely than Hindus to say that "A university education is more important for a boy than a girl" (Appendix Table A1, columns 1 and 2). There is also no significant difference between Muslims and Hindus on whether they agree with the statements "Men make better political leaders than women do" and "Men make better executives than women do" (columns 3 and 4).

3. Data

3.1. Data on politician religion

We constructed a unique dataset that identifies all candidates for state legislative assembly elections by their religion. We used data on state legislative elections provided by the Election Commission of India that list the name, constituency, political party, and votes obtained by every candidate for all elections from 1979-2010. We inferred religious identity from candidate names (first names and surnames) and classified candidates as Muslim or non-Muslims. While Muslim names are often readily identifiable, it is difficult to distinguish Hindu names from those of other religious minorities such as Sikhs, Jains, Buddhists or Christians who constitute approximately 6% of India's population. Thus, we effectively compare Muslim legislators to those of all other religions, with Hindus being the most numerous among them.[9]

To minimize errors, we used two independent teams to conduct this classification of legislator names. The first team used a software program called "Nam Pehchan," which could classify about 72% of the names; the rest were classified manually. A second (India-based) team performed the whole classification manually, using their judgment gained from prior work with Election Commission files. Disagreements between the two classifications were resolved by the authors on a case-by-case basis. After this procedure, we remained doubtful of the religious identity of less than 0.5% of candidate names (out of more than 250,000 names), and classified them as "non-Muslim" as a tie-breaking rule. These data were first used in Bhalotra et al. (2014).

3.2. Data on birth outcomes

We use retrospective fertility data from the National Family Health Survey of India (NFHS), a nationally representative survey that is one of the multi-country Demographic and Health Surveys. We pool the two most recent waves that have district identifiers: the second wave (NFHS2), conducted in 1998-1999, and the fourth wave (NFHS4), conducted in 2015-16).[10] Women aged 15-49 at the time of the survey are asked to record their complete fertility histories and any child deaths. This enables us to identify the gender at birth of each child, whether the child

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[9] Observed gender ratios among Sikhs are worse than among Hindus. Christians are similar to Muslims in being opposed to abortion; therefore, pooling Christian legislators with Hindus will lead to the under-estimation of the impact of Muslim relative to Hindu legislators.

[10] The third NFHS wave conducted in 2005-06 does not have district identifiers, and the first NFHS wave (1992-93) covers fewer households and a smaller time period.

died within the first month of life (neonatal mortality) and whether the child died in the first year of life (infant mortality).

While legislators win electoral constituencies, the lowest geographic level at which we have information on birth outcomes is the administrative district of residence of the respondent mother. Almost all state electoral constituencies are contained within district boundaries and the average number of constituencies per district is 10. The map in Appendix Figure A3 illustrates the match between electoral constituencies and administrative districts. It shows the district of Ghaziabad, which has eight electoral constituencies. We match electoral to birth outcome data by aggregating the electoral data to the district level using the administrative district boundaries in the 1991 census. We then study variation generated by close elections (discussed below) in the *fraction* of legislators in the district who are Muslim.

In our main specification, we restrict the analysis to the 16 largest states in India that contain more than 95% of India's population, and 94% of the Indian Muslim population in India. The key exclusion here is the one Muslim-majority state of Jammu & Kashmir, but we verify that our results are robust to its inclusion.[11] The analysis is conducted for births over the three-decade period 1980-2011; note that most of the births in the first decade are from NFHS2, and most of the births in the third decade are from NFHS4 (see histogram in Appendix Figure A2). Since many administrative districts undergo geographical splits over time, we aggregate these districts back to 1981 district boundaries for our analysis. Our main regression sample has data on 861,010 births for 321,924 mothers across 347 districts.

[11] Jammu &Kashmir is also exceptional in being the scene of a long-running dispute between India and Pakistan. This state had its elected assembly suspended for several years, and many special laws apply solely to this state, while some national laws do not apply to it. Most of the state's autonomy provisions were scrapped by the federal government in 2019.

3.3. Defining birth outcomes

We conceptualize a family as making the following sequence of choices: whether to conceive; conditional upon conception, whether to engage in prenatal sex detection; conditional upon knowing fetal sex, whether to abort; and conditional upon not aborting, how much to invest in children and in particular, whether to invest differently in sons and daughters. The main outcome of interest is an indicator variable for whether a birth is a girl, a widely used marker of sex-selective abortion. Official data are likely to under-report abortions, since most abortions do not take place in health facilities (Singh et al., 2018), and survey data are subject to potentially endogenous under-reporting.

So as to check whether any change in live girl births (relative to boys) is offset or reinforced by changes in girl relative to boy mortality after birth, we examine neonatal and infant mortality, defined as dummies for whether the child died in the first month and the first year of life respectively. Child mortality rates are often used as indicators of post-birth investments in children in developing countries where mortality rates are high and sensitive to parental investments.

Sex at birth and mortality after birth are both conditional on the occurrence of a birth (fertility). We model fertility using a dummy for whether the individual mother has a birth in a given year. As explained earlier, this is relevant to testing whether the selective abortion of girls falls under Muslim legislators because families decide they want more girls, or because they pursue sons by continuing fertility. We expand the data to create a mother-year panel, the length of which is the duration of her reproductive years (which we assume starts at age 15) and conditioning on time since last birth. Since fertility decisions are typically made in the year before the child is born, we match all birth outcomes to the district-level share of Muslim legislators in the year before birth.[12]

4. Empirical Strategy

4.1. Identification using close elections

We want to estimate the impact of the Muslim legislators winning in a district on the birth outcomes of households living in that district in a given year. In general, the election of Muslims rather than non-Muslims is likely to be correlated with constituency (or district) characteristics, including demographics (share of Muslims), political circumstances and voter preferences. We address this by using the sample of constituencies in which Muslims contest against non-Muslims in a close contest, exploiting the sharp discontinuity in the chances of winning at the zero-vote margin. This ensures that constituency characteristics, demographics, political circumstances, voter preferences, and issue salience that may be generated by the fact of a close contest are balanced across constituencies in which a Hindu vs a Muslim wins a close election.

However, as noted earlier, we cannot use the sharp RDD because we do not have outcome data at the constituency level. Instead, we aggregate over all constituency-specific discontinuities within a district and use a two-stage least squares approach. The explanatory variable is transformed from a dummy for a Muslim winner to the fraction of all seats won by Muslim legislators in a district. We instrument this with the fraction of seats in the district won by Muslim politicians in close elections against non-Muslim politicians. We define close elections as elections in which the winner won by a margin of less than 3% of votes, and investigate alternative vote

[12] Since the data record district of residence rather than district of birth, we restrict the sample to children who were conceived in their current location. Approximately 22.7% of the survey respondents in our pooled sample moved to their current area of residence after the child was conceived.

margins as a robustness check. 1581 district-year observations in our data (14%) feature a close inter-religious election; of these, approximately half result in a Muslim winning the close election (see summary statistics in Appendix Table A2). As in the standard RDD, our regressions control for a second-order polynomial in the vote margin but now we include polynomials in as many vote margins as there are constituencies in the district. We show that results are robust to dropping the margin controls (Table A6), and to a specification where we control for a linear function of the margins and we restrict the sample to district-years that had close elections (Table 3, column 5).

4.2. Empirical specification

The instrumental variables (IV) regression equation is as follows, where equation (1) is the second stage and equation (2) is the first stage:

$$(1) \qquad Y_{idst} = \theta_{ds} + \psi_t + \beta\, ML_{ds,t-1} + \lambda TC_{ds,t-1} + \Sigma^{Nd}_{j=1}\, \alpha_{1j}\, I_{jds,t-1} * G(m_{jds,t-1}) + \Sigma^{Nd}_{j=1}\, \alpha_{2j}\, I_{jds,t-1} + X_{idst}\, \eta + \varepsilon_{idst}$$

$$(2) \qquad ML_{ds,t-1} = \theta_{ds} + \psi_t + \kappa MC_{ds,t-1} + \mu TC_{ds,t-1} + \Sigma^{Nd}_{j=1} \vartheta_{1j}\, I_{jds,t-1} * G(m_{jds,t-1}) + \Sigma^{Nd}_{j=1}\, \vartheta_{2j}\, I_{jds,t-1} + X_{idst}\, \sigma + u_{ds,t-1}$$

where Y_{idst} is the dependent variable for mother *i* giving birth in district *d* of state *s* and year *t.* The outcomes we model include dummy variables indicating a girl child in a sample of all births, indicating a birth in a sample of all reproductive age women, and indicating a girl child in a sample of all infant and neonatal deaths. The explanatory variable of interest is $ML_{ds,t-1}$, the fraction of constituencies in the district in which a Muslim legislator was elected in district *d* in the year before birth, *t-1,* the lag allowing for conception, prenatal sex detection, and abortion decisions being made a year before the birth outcome is realized. The coefficient of interest is β, which identifies the impact of Muslim relative to non-Muslim legislators.

The share of all constituencies won by Muslim legislators $ML_{ds,t-1}$ is instrumented with the share of constituencies in the district won by Muslims in close elections against non-Muslims in the same year, $MC_{ds,t-1}$. The fraction of constituencies in the district in which there were close elections between Muslims and non-Muslims, $TC_{ds,t-1}$, is controlled for in the second stage (equation 1) and partialled out of the instrument in the first stage (equation 2). The margin of victory for an inter-religious contest in constituency j of district d is denoted $m_{jds,t-1}$, defined as the vote share of the Muslim candidate minus the vote share of the non-Muslim candidate, so that by construction, a Muslim wins when the margin is positive. We control for second order polynomials of each constituency-level margin of victory in all constituencies with inter-religious elections in a district, denoted G($m_{jds,t-1}$). The polynomials are interacted with $I_{jds,t-1}$, which is an indicator for whether there was an inter-religious contest in constituency j of district d. We also include indicator variables for whether there are inter-religious races; Nd is the total number of constituencies in district d.

θ_{ds} represents district fixed effects, which control for time-invariant district characteristics including the history of Muslim presence in the district, sluggish demographic characteristics including the share of the district population that is Muslim, the slowly moving component of public goods infrastructure and time-invariant voter preferences. Cohort (year-of-birth) fixed effects ψ_t afford a flexible representation of aggregate shocks or nationwide policies that may have influenced both birth outcomes and the religion mix of politicians. X_{idst} is a vector of mother characteristics including dummies for rural residence, education categories, categorical variables for mother height and age at marriage[13] and whether the mother belongs to a scheduled caste or tribe (which we loosely refer to as "low caste") or to the "Other Backward Castes." To allow

[13] Since there were many missing observations for mother height (a measure of her nutritional and health status) and age at marriage, we created categorical variables to avoid losing data. For height, the categories are the four quartiles of available height measures and a fifth category for missing data. For age at marriage, we have the following categories: married before age 15, married between ages 15 and 17, married between ages 18 and 20, married at age 21 or later and missing (which would include unmarried women). The legal age of marriage for women in India is 18.

outcomes in a district to be correlated across families in the district and across time, the standard errors are clustered at the district level.[14]

To summarize, the thought experiment generated by our estimation strategy is that one or more Muslim legislators win in close elections against non-Muslims (conditional upon the occurrence of a close election), exogenously increasing the fraction of seats with Muslim legislators. The hypothesis we test is that this will result in lower rates of sex-selective abortion in the district from which the legislator is elected. For convenience equation (1) does not display interactions by birth order but, for the reasons explained in section 1, we interact legislator religion with birth order in order to purge influences common across birth order such as on health (shown in Bhalotra et al. 2014), and to thereby isolate influences on sex-selective abortion which we know is conducted for higher parity births but not for first births.

4.3. Validity of the identification strategy

In this section we first present tests of the validity of the RDD that underlies our IV identification strategy (Imbens and Lemieux, 2008) and then point to evidence to defend the additional identifying assumption that the sex of the first born child is conditionally randomly assigned.

RDD tests: First, we test for vote manipulation around the zero vote margin and find that the vote margin is continuous in the neighborhood of zero, the threshold which separates the Muslim victory from the non-Muslim victory (Figure 3A). A formal test estimating the difference in the densities on either side of the zero point (McCrary, 2008) confirms this, the estimated difference being a statistically insignificant -0.0038 (Figure 3B). Second, we examine whether

[14] Our explanatory variable varies at the level of the district and election year. Strictly speaking, we should therefore cluster standard errors at the district x election term level. Our district-level clustering is therefore a stricter specification, and likely to overestimate standard errors.

constituency demographics vary discontinuously at the zero -vote margin, in the spirit of a test of balance between treated constituencies (in which a Muslim narrowly won against a non-Muslim) and control constituencies (in which a non-Muslim narrowly won against a Muslim). Using demographic characteristics from the 2001 census at the constituency level, we show RDD plots for the fraction of the population that is urban, the fraction of population belonging to Scheduled Castes and Tribes, the female population share and the average literacy rate (Figures 4A-4D). These characteristics are graphed against the victory margin on the x-axis, with the lines representing a non-parametric (lowess) fit on either side of the discontinuity. None of these characteristics exhibits a discontinuity at the zero-vote margin. The share of Muslims in the population (at district level) is also continuous across the zero-margin threshold (Figure 4E).

Third, we examine political characteristics of the constituency, and find that electoral races with Muslim winners are not significantly different from those with non-Muslim winners in terms of total votes cast, number of candidates and the participation of Muslims and women as candidates (Figures 5A-5D). However, Figures 5E-5G show that Muslim winners, even in close elections, are significantly more likely to belong to the Indian National Congress (INC) party or the Bahujan Samaj Party (BSP), and significantly less likely to belong to the Bharatiya Janata Party (BJP). This is not surprising, given that the BJP often espouses a vision of India as a Hindu nation while the other parties do not. There is no difference in the probability of Muslim winners belonging to Communist parties (Figure 5H). In all regressions, we include controls for the fraction of seats in the district won by the INC, the BJP and the BSP, ensuring that the effect we capture is the effect of the personal religious identity of legislators, over and above any political party effect. We further verify that Muslim winners are not more likely to be incumbents compared to non-Muslims, which rules out incumbency effects explaining our results (Figure 5I).

Although the close election strategy does not require balance on other personal characteristics, it is useful for interpretation of the estimates to consider how the characteristics of Muslim vs non-Muslim legislators who win in close races against the other religion compare. Data on candidate characteristics are only available after 2003. Using data from 2004 to 2007, we find no significant differences in education levels, net worth (assets minus liabilities) or the likelihood of having serious criminal charges pending against them (Appendix Figure A4). While we do not find any differences in these observable characteristics, we cannot rule out that Muslim winners have different unobservable characteristics. However, to compete with our interpretation that sex ratios improve under Muslim leaders because of their preferences against abortion, such unobservables would need to be correlated with preferences over abortion.

Tests of random assignment of sex of first births: Using the NFHS surveys, the same data source used in this study, Anukriti et al. (2021) demonstrate support for this identifying assumption. They show that families with firstborn boys and firstborn girls are similar on a rich set of observables (Table 2 of their paper), that the share of girls among first births has not decreased over time in sharp contrast to the share of second and higher order births, and that this holds conditional and unconditional upon indicators for availability of prenatal sex detection and for the socioeconomic status of the family. Similar evidence is provided in earlier studies as well (Das Gupta and Bhat 1997; Visaria 2005; Bhalotra and Cochrane 2010; Almond et al., 2013). It lines up with the fertility preference data that we display in Table 1 which shows that Indian families want, on average, about 1 girl and 1.3 boys. It follows that the average family is not unhappy to have a girl at first birth but if desired family size is in the region of 2.3 then they have an incentive to sex-select after the first birth. This also explains why declines in desired or permitted fertility exacerbate sex selection (Ebenstein, 2010; Jayachandran, 2017).

4.4. First stage relationship

We now verify that aggregation of constituencies to districts does not invalidate our empirical strategy. A particular concern is that, if a Muslim winning a close election in a district was always matched by another Muslim candidate losing a close election in the same district, then the results of close elections would not change the district fraction of Muslim legislators. Figure 2A plots the average fraction of seats won by Muslim legislators in the district against the victory margin, defined as the difference in vote share between the Muslim and the non-Muslim candidates in each one of the electoral constituencies of the district, so that margin > 0 denotes a Muslim electoral victory and margin < 0 denotes a Muslim loss. We see that when a Muslim narrowly wins against a non-Muslim (i.e. when the vote margin is just larger than zero), there is a dramatic jump in the district share of Muslim legislators. In other words, if a Muslim wins a close election in any electoral constituency within a district, then the overall fraction of Muslim legislators in the (larger) administrative district rises significantly. This first stage effectively aggregates across all these points that are near the discontinuity. The first stage regression results, estimates of equation (2) above, are shown in Appendix Table A4, and they confirm that the instrument is a strong predictor of the fraction of Muslim legislators in a district.

4.5. External validity

Although the use of close elections ensures the internal validity of our estimates, the *occurrence* of close elections between Muslims and non-Muslims in a given district and year may not be randomly assigned. In particular, close inter-religious elections are more likely to occur in areas with a higher population fraction of Muslims; these areas tend to be more urban and have a lower population share of Scheduled Tribes, due to the pre-existing residential patterns of these groups (Appendix Table A3). However, other characteristics such as the presence of Scheduled

Castes or the education levels of mothers are very similar across districts that ever had a close election and those that never did.[15] It is also important to note that our main outcome, namely the gender ratio at birth, is very similar across these two types of areas. Areas that experienced close elections have higher fertility rates, consistent with their higher presence of Muslims and the documented Muslim preference for larger families.

The occurrence of close inter-religious elections is not geographically concentrated: all states in our sample and nearly half of all the districts in our sample (167 out of 347) experience at least one such (close) election over our sample period. Close elections occur across a wide range of voter preferences towards Muslims. This is seen in Figure 2B where we plot the margin of victory between the Muslim and Non-Muslim candidate (when they are the top two vote-getters) against the share of votes obtained by Muslim candidates, a proxy for voter preferences using electoral constituency data. Among constituencies where the vote margin was 3 percentage points or less (i.e. close), the vote share of Muslim candidates varies considerably, from 16.5% to 51.1%. The treatment effect (effect of Muslim winning) may thus be regarded as representative of a range of political circumstances.

To account for potential selection into close elections, we control for the fraction of constituencies in the district that were contested in close elections between Muslim and non-Muslim candidates in both the first and second stage. Our IV estimates thus compare outcomes in districts where Muslims won close elections to those where they lost close elections, controlling for the potentially non-random occurrence of such elections. This also controls for any direct

[15] The Scheduled Castes are communities that have historically been at the bottom of the Hindu caste hierarchy. Scheduled Tribes include communities traditionally outside the Hindu caste system. Other Backward Castes refer to castes that are in the middle of the caste hierarchy.

effects of having close elections between the religions, such as greater political mobilization by parties or greater issue salience generated by the "excitement" of a close contest.

5. Politician Religion and Birth Outcomes

5.1. Sex ratio at birth

We first discuss estimates of equation (1) when the dependent variable is the probability that a birth is a girl, on a sample of all births. On average, we find no significant impact of legislator religion on this variable (Table 2, column 1). However, when we break out the effects by birth order, we see that there is a significantly higher probability of girl births at birth orders two and above in districts with a higher fraction of Muslim legislators (column 2). In fact, this is driven by birth orders three and above, where the coefficient is significant at the 1% level of significance (column 3). Since districts on average have about 10 electoral constituencies (the mean is 9.95), one additional Muslim legislator in the district increases the fraction of Muslim legislators by approximately 10 percentage points, which increases the probability of a girl birth at birth order three or higher by 0.702 percentage points. This corresponds to 85% of the deficit in the sex ratio of third births attributable to sex-selection.[16] In 1995, arbitrarily selected as being in the middle of our sample, there were 26.3 million births in India and 45.4% of these were third order or higher. Our estimates imply that if Muslim representation increased from the current district average of 5.6% to the population share of 13% (see district-level summary statistics in Appendix Table A2), this would increase third-order girl births by approximately 47,300. Thus, the impact is sizeable, considering that Bhalotra and Cochrane (2010) estimate a total of 0.48 million sex-selective abortions per year in 1995-2005.

[16] This estimate is drawn from Bhalotra, Cochrane and Tam (2021) and is obtained by differencing with respect to first births, differencing between pre vs post ultrasound cohorts and averaging over the period 1970 to 2015.

Figure 6 shows the reduced form effects, regressing district-averaged gender ratios against Muslim vote share at the constituency level and displaying results by birth order. We plot regression discontinuity graphs fitting a nonparametric function (lowess) on both sides of the discontinuity. These plots confirm the patterns in Table 2, showing an increase in the fraction of births that is most evident from birth order 3, and absolutely not present at first birth.

Table 2 also displays the main effect of Muslim legislators which, in columns 2 onward, is the coefficient for the firstborn child. The coefficients for higher order births, which are of opposite sign, pick up the impact of sex-selective abortion (girl foeticide) net of any overall improvements in foetal health effected by Muslim legislators. As discussed earlier, previous research indicates that the sex of first births is not manipulated. The first birth attracts a negative, although insignificant coefficient, which is consistent with previous evidence that Muslim legislators are better at delivering maternal and child health services (Bhalotra et al., 2014). In view of the greater innate vulnerability of the male foetus (Low, 2001; Waldron, 1983), this will favor survival of male births. In columns (4) and (5) we show results separately for the second and fourth rounds of the NFHS. The effect is larger for NFHS2 but remains positive and significant using NFHS4. While there is some overlap of birth cohorts between the two waves (Appendix Figure A2), the comparison across waves captures changes over time that are broadly consistent with declines in desired family size and in son preference over time (Appendix Figure A1).

5.2. Robustness checks

So as to analyze sensitivity of our results to mother characteristics which might be correlated with the outcome and influence compliance, we drop mother's height and age at marriage (Table 2, column 6), and then all mother characteristics including education (Table 2, column 7), and the coefficients remain significant and of similar size. We subjected the main results on the relative chances of a girl birth to a suite of robustness checks, using the specification in Table 2, column 3. We tested robustness to controlling for state*cohort fixed effects that include all state-level legislative changes, district-specific linear trends that capture trends in public health including availability of contraceptives, and to the inclusion of the Muslim-majority state of Jammu and Kashmir in the sample (Table 3, columns 1-3). The coefficient of interest remains statistically significant and is slightly larger than in our base specification.

Restricting the sample to districts that had at least one close inter-religious election over our sample period (which generates most of the instrumental variation in our data) decreases the coefficient, but it is still significant at the 10% level (column 4). We then restrict to district-years (rather than districts) that experienced a close election, and control for linear margins rather than quadratic polynomials (column 5). This corresponds to the local linear specifications in the RDD literature (Imbens and Lemieux, 2008). The size of the coefficient remains similar to our baseline coefficient, but we lose statistical significance because of the large decrease in the number of observations. In Appendix Table A6, we provide further robustness checks to assess sensitivity to controlling for polynomials of the margins of victory (column 2) and political party (column 3), and we also report OLS regressions (column 4).

We checked sensitivity to the definition of close elections, replacing the 3% vote margin with a series of alternative vote margins ranging from 1% to 4.5%. The coefficients are very similar, and remain in a narrow range between 0.05 and 0.1 (Figure 7A). We conducted a placebo test that examines whether the religious identity of future legislators elected in years $(t + 4)$ or later affects the birth sex ratios in year t. Since $ML_{(t-1)}$ is the explanatory variable in the original specification, $ML_{(t+4)}$ is five years later and therefore reflects legislator identity in the next electoral term (state legislators in India have five-year terms), which should not affect past outcomes. We find it does not (Figure 7B).[17] Finally, we verify that the coefficients are not sensitive to dropping any specific state from our analysis (Figure 7C).

5.3. Fertility

As discussed earlier, continued fertility may be an alternative to sex-selective abortion in achieving a desired gender mix of children. We examined the probability of a (live) birth, keeping in mind that this reflects a combination of the decision to conceive and the decision not to terminate the pregnancy (for sex selection or other reasons). In districts with a higher fraction of Muslim legislators, we find a significantly higher probability of a birth at birth orders 2 and greater (Table 4, column 2), which is driven by birth orders 3 and above (column 3). We estimate that one additional Muslim legislator (instead of a non-Muslim legislator) leads to a 1.04 percentage point increase in the probability of a birth at order three, which is (statistically) similar to the 0.702 percentage point increase in the probability of a girl birth at order three that we reported in Table 2, column 3. This makes it plausible that increased fertility at order three under Muslim leaders is a mechanical reflection of reduced abortion of the girl foetus. As with the sex ratio regressions in Table 2, we find a smaller effect on fertility for NFHS2 compared to NFHS4 (columns 4 and 5).

We may additionally expect that families that do not conduct sex selection at order three but that nevertheless desire more sons, will continue fertility.[18] Consistent with this, we find that in districts with Muslim legislators there is an increased probability of fourth and higher order births, also of about 1.02 percentage point (Table 5, column 1). The magnitude of this effect on fertility is broadly in in the same ballpark (slightly smaller) as impacts of papal influence or political sentiment in Bassi and Rasul (2017) and Dahl et al. (2021). Similar to Table 4, the results

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[17] More than 70% of Muslim legislators who win in close elections are replaced by non-Muslims in the next election.

[18] Evidence in Anukriti et al (2021) implies that fertility motivated by the hope for a son widens the gap between desired and actual fertility.

in this table are stronger in NFHS2 than in NFHS4 (columns 2 and 3), and remain significant with or without the inclusion of controls for mother characteristics (column 4 and 5).

5.4. Infant mortality of girls relative to boys

We took the sample of children who died within one month (neonatal mortality) and one year (infant mortality) of birth and defined the dependent variable as one if the death was of a girl, and zero if it was of a boy. Table 6 shows that under Muslim legislators, girls at third and higher order parity are significantly more represented among those who died, the difference being 1.85 percentage points for neonatal deaths and 1.44 percentage points for infant deaths (columns 1 and 2). This suggests a substitution of postnatal for prenatal death of girls relative to boys, demonstrated in the reverse direction- operating over time- in Anukriti et al. (2021), and this corroborates the earlier evidence against legislator religion influencing the sex ratio at birth by changing son preferences.[19] While almost no substitution is observed in NFHS-2, coefficients are larger in NFHS-4, consistent with the larger pressured exerted by the reduction in fertility preferences (Table 6, columns 3-6).

5.5. Direct measures of citizen gender preferences

Two further pieces of evidence find no support for Muslim legislators changing families' gender preferences. Using self-reported data on the ideal share of sons as the dependent variable, we test whether this is influenced by legislator religion and find no evidence that this is the case (Table A8, column 1).[20] We then test whether families who want to commit sex selective abortion

[19] Note that here we model the gender difference in early childhood deaths under Muslims, and not the probability of childhood death. We did investigate this and we find no significant differences in neonatal or infant mortality at third and higher parity by legislator religion though, pooling across parities, we find reduced mortality rates under Muslim legislators, a result that we discuss in Bhalotra et al. (2014).

[20] There is no time variation in this variable in the NFHS so we make the bold and untestable assumption that this variable is meaningful for those women who report it close to the start of their reproductive careers, which we approximate as age 20. Since we have women of different birth cohorts interviewed in two waves we are able to generate time variation to match with variation in legislator identity. This analysis is crude and we do not lean on it.

but are hampered in doing this under a Muslim legislator delay pregnancy till their election term has passed and then enact their preferences if the Muslim is replaced by a non-Muslim. We find some evidence of this (Table A8, columns 2-5), where we show the results of regressing girl birth in future periods *(t+3, t+4, t+6, t+10)* on $ML_{(t-1)}$. Given the five-year term of legislators, periods *(t+4)* onward are likely to not have a Muslim legislator, since more than 70% of close-election Muslim winners are succeeded by non-Muslim winners.[21] We find what appears to be a compensating increase in sex selective abortion soon after the legislator's term ends that does not persist through to the end of the next election term. These results reinforce the findings so far in suggesting that there is no change in son preference under Muslim vs non-Muslim legislators.

5.6. Heterogeneous effects

Overall, these results are indicative of family behavior under Muslim legislators remaining son-seeking, albeit using fertility and postnatal girl mortality instead of sex selective abortion to achieve the goal. To further investigate it, we separated families into those with first-born girls vs first-born boys, relying upon carefully documented evidence in Anukriti et al. (2021) that the sex of the first born child is randomly assigned across families. There is also clear evidence that families that lack a boy child are more likely to conduct sex selection (Figure 1, panels C and D).

We find that the impact of Muslim legislators on sex selection is higher among families where the first child is a girl compared to those where the first child is a boy (Table 7, columns 1 and 2). Consistent with the increase in fertility under Muslim legislators being son-biased, we find larger fertility increases and larger increases in excess girl mortality in first-girl families (columns 3-8). The coefficients are not (statistically) significantly different in these smaller data samples,

[21] It is relevant to add that of all seats *lost* by Muslims in close elections, 75% are subsequently won by non-Muslims. The similarity is exactly what we would expect if outcomes of close elections are quasi-random.

but they are different by an order of magnitude. The fact that results for the three outcomes line up as being concentrated among families that have been shown to be driving sex-selective abortion allows us to trace them all to the practice of abortion.

We report results for other heterogeneity tests on the main outcome in Table A5. We investigate whether the effects of Muslim legislators on sex selective abortions vary by the religion of the mother. We find that the effect is concentrated among Hindu and Sikh families (columns 1 and 2), who have been shown to be more likely than Muslim families to commit sex selection, whether among Asian immigrants in Canada (Almond et al., 2013) or among Indians (Bhalotra and Cochrane, 2010). We similarly find that the effects are concentrated in states with more male-biased population gender ratios in 1981 (columns 5 and 6), and we find no significant differences in the impact of legislator religion on the birth sex ratio by mother's age (columns 3 and 4).

5.7. Violence against women

The results for fertility and childhood mortality undermine changes in fertility-related sex preferences as a channel but since sex-selective abortion also harms the health of women, we investigated whether Muslim legislators exhibit pro-female policies in general. We do this by investigating the effects of Muslim legislators on violence against women. Female foeticide is a form of violence against women, making this also a cognate outcome.

We first use self-reported domestic violence, recorded in the NFHS, which takes great care to ask questions in a confidential setting to encourage reporting.[22] We find no significant impact of legislator religion on the fraction of women who report being beaten over the past 12 months, at either the extensive or intensive margins (Appendix Table A7, panel A, columns 1 and 2). We

[22] Since these questions were asked only for the time of the survey, there is no time variation in the data. We therefore run a regression that includes state*year of interview fixed effects (the survey was conducted over 1998, 1999, 2015 and 2016), and instrument the fraction of Muslim legislators in the district with the fraction of Muslim legislators who won in close elections with a vote margin of less than 3%.

also find no change in attitudes towards domestic violence, measured as the fraction of female respondents who agree that it is acceptable for a husband to beat his wife for any reason (columns 3 and 4).[23]

We then used administrative records of gender-based crimes reported to the police as previous research has shown that policymakers can influence the reporting and handling of crime against women (Iyer et al., 2012; Amaral et al., 2021). We obtained data for 1980-2008 from the National Crime Records Bureau, and ran an instrumental variables regression, similar to equation (1), controlling for district and year fixed effects. The dependent variables are the logarithms of per capita reports of rape, kidnapping of women and girls, sexual assault, sexual harassment, domestic violence and dowry deaths. We find no significant effect of legislator religion on any of these crimes against women (Appendix Table A7, panel B).[24] We recognize that it is possible for an increase in reporting of crimes to be counterbalanced by an increase in deterrence, but we nevertheless did these tests on self-reported and police-reported violence because it is of independent interest to consider broadly related outcomes, as this can illuminate the motives and mechanisms underlying our main result.

5.8. Comparison with female legislators

It is natural to ask whether female legislators act to limit female foeticide and to expect that this too will illuminate political preference or identity-based influences on this outcome. Existing evidence suggests that the presence of women leaders changes policy outcomes towards those preferred by women (Baskaran et al., 2020; Iyer et al., 2012). We therefore model the three birth-

[23] We examine two reasons that are consistently enumerated across both survey waves, namely whether the husband is justified in beating his wife if he suspects her of being unfaithful or if she shows disrespect for her in-laws.
[24] The last four categories are reported only in years 1995 and later; kidnapping of women and girls is reported for years 1985 and later. We see no impact of Muslim legislators on crimes against women even in the longer sample period of 1980-2008 for which we have crime data.

related outcomes again, but now comparing female with male legislators rather than Muslim with non-Muslim legislators. Identification proceeds in a similar manner, using a close elections strategy and differencing by birth order, but now using a sample of elections in which the top two contestants are a man and a woman as, for instance, in Bhalotra and Clots-Figueras (2014).

Having female as opposed to male legislators in a district has no significant impact on the sex ratio of either births or infant deaths but it leads to significantly lower fertility (Table 8). These present a stark contrast to the impact of Muslim legislators, which is to increase the share of girls at birth, increase the share of girls among infant deaths and to increase fertility. The results for women are consistent with (a) the fact that women in the NFHS survey report a high degree of son preference, and (b) women usually wanting fewer children than men (Ashraf et al., 2014). The latter has also been documented by demographers using the World Fertility Surveys, and Bhalotra et al. (2020c) show that increasing the share of women parliamentarians (via gender quotas) leads to expansions in reproductive health coverage including contraceptive coverage, and to declines in fertility.

6. Discussion

Our working hypothesis is that our results arise from stronger anti-abortion preferences among Muslims that are embodied in Muslim legislators. We are able to discriminate between preferences over abortion and preferences over sons using stated preference data and by demonstrating that fertility and girl-biased infant mortality increase in Muslim-won districts. Our results indicate that the operative mechanism is not a change in son preference. We consider now the channels through which the presence of Muslim legislators might have changed the practice of selective abortion. Legislators can exert their preferences by proposing or voting for legislation, monitoring adherence to existing legislation and directing resources to specific causes. They can also exert influence through informal channels including deliberation, making issues they care about salient or providing information to citizens. Even if leaders do nothing, citizen reactions to leader identity can change individual behavior.

State-level legislation is clearly not the primary mechanism here as there was a federal ban on prenatal sex detection in 1996, the Pre-Conception and Pre-Natal Diagnostic Techniques (PC&PNDT) Act, preceded only by similar legislation being passed in the state of Maharashtra in 1988. In any case, we showed that our estimates are not sensitive to controlling for state-year fixed effects (Table 2), which would absorb changes in state level laws. State legislators can influence implementation of federal or state laws or programs in their electoral districts (Gupta and Mukhopadhyay, 2016; Baskaran et al., 2015; Min, 2015; Asher and Novosad, 2017; Baskaran et al., 2021). Using data in a narrow window of two years on each side of the federal ban to limit the play of confounding events, we examined whether the impact of legislator religion on sex selective abortion is higher after its enactment in 1996. The coefficient for the post-reform period is significant and larger, although it is not statistically significantly different from the pre-reform coefficient (Appendix Table A5, columns 7 and 8). This is consistent with the federal law providing legislators with a tool with which to achieve lower abortion rates, though this need not be the only or the main channel of their influence. We could not identify systematic data on enforcement over time and across districts, nor on expenditures relevant to abortion reduction.

Informal mechanisms of salience and information are difficult to measure but recent research analyzing the text of debates in parliaments and local government councils reveals that legislators bring their preferences to the table, for example, women are more likely than men to discuss issues that concern women including childcare and health (Baskaran and Hassami, 2019;

Lippmann, 2020; Bhalotra, Fernandez and Slapin, 2018). Political deliberation is often the first step towards legislation but even where legislation does not follow, it has been shown to influence public opinion (Chong and Druckman, 2007).[25]

Our findings are broadly coherent with research that finds leader effects on fertility in circumstances where the leaders *did* nothing in the political space to influence it. Bassi and Rasul (2017) show that persuasive messages in the Pope's speeches during a visit to Brazil led to reductions in contraceptive use of more than 40% and a 1.6% increase in fertility nine months later. Dahl et al. (2021) show that political sentiment led to higher fertility in Republican relative to Democratic districts following the election of Donald Trump, the differences being sizeable at 1.1 to 2.6 percentage points. Using a lab in field experiment in India in which groups are assigned to either Muslim or Hindu leaders, Bhalotra et al. (2021) demonstrate that citizen behavior in a coordination game varies with leader identity, conditional upon leader actions. Beaman et al. (2009) show that quotas for women in local government lead to higher aspirations and increased educational attainment for girls. These studies suggest that leader identity can influence citizen behavior through the largely unobservable channels of inspiration, optimism or sentiment. Overall, other than the weak evidence we present to suggest that Muslim legislators may have strengthened enforcement of the federal ban on prenatal sex detection, it is difficult to find data to systematically document these more informal channels.

7. Conclusions

We examined whether the religious preferences of elected representatives can shape the birth outcomes of the population, using a combination of two large-scale representative household

[25] We tried but were unable to obtain systematic records of state legislative assembly speeches in India.

survey datasets and a unique database identifying the religion of all candidates for election to India's state legislative assemblies. We focused on sex-selective abortion as an outcome, because different religions have different preferences towards abortion, and sex-selective abortion is a phenomenon of growing proportions. Moreover, it is a phenomenon that appears not to have responded to policy-led prohibitions. Our results suggest that one reason for this is that India has predominantly Hindu legislators whose preferences are likely to be aligned with those of the majority Hindu population, who appear tolerant of sex-selective abortion. Using a quasi-experimental approach, we show that Muslim legislators are more effective at controlling the selective abortion of girls. Our paper highlights that the personal identity of legislators is a key component of policy effectiveness.

In line with the idea that this mainly reflects the exercise of anti-abortion preferences, we find a rise in fertility under Muslim legislators, suggesting a substitution from sex-selective abortion to greater fertility as a means of achieving the desired gender mix of children. We also find evidence consistent with an adjustment in parental investments in children, marked by girls being more likely than boys to die in infancy at higher parities. This clarifies that there was no change in the underlying preference for sons, just a change in abortion practices. Our estimates imply that reducing barriers to Muslim representation in political office may help to counteract the rising trend of sex-selective abortion in India, albeit with concomitant increases in fertility and excess girl mortality, highlighting the challenges of formulating policies that conflict with citizen preferences.

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Table 1
Abortion and Son Preferences by Religion

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Agree that abortion is acceptable when				NFHS Surveys		
	Mother's health is at risk	Child is physically handicapped	Mother is not married	More children are not wanted	Ideal number of boys	Ideal number of girls	Ideal share of boys
Muslim	-0.0720**	-0.125***	-0.0882**	-0.0551	0.290***	0.205***	0.00275**
	(0.0319)	(0.0433)	(0.0426)	(0.0431)	(0.0139)	(0.00878)	(0.00111)
Dep var Mean for Non-Muslims	0.908	0.688	0.723	0.613	1.275	0.979	0.562
N	2344	2344	2344	2344	317185	317185	283528
R-squared	0.013	0.011	0.008	0.012	0.223	0.101	0.038

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Data from World Values Survey for India in 1990 in columns 1-4; 6% of this sample is Muslim. Controls include gender, age, education categories, marital status of the respondent and family income categories. Data from NFHS-2 and NFHS-4 in colulmns 5-7. Controls include district fixed effects, mother's year-of-birth fixed effects, dummies for rural residence, Scheduled Caste, Scheduled Tribe, Other Backward Caste, education levels of mother, categorical variables for mother height and age at marriage).

Table 2
Legislator Religion and Sex-Selective Abortion

Dependent variable: Dummy for the birth of a girl child

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Pooled birth order	Order 2+	Order 2, 3+; Baseline specification	Order 2, 3+; NFHS 2	Order 2, 3+; NFHS 4	Drop mother height and age at marriage	Drop all mother characteristics
Fraction Muslim legislators (ML)	-0.0279	-0.0672	-0.0671	-0.347	-0.0219	-0.0663	-0.0615
	(0.0750)	(0.0770)	(0.0769)	(0.455)	(0.0761)	(0.0770)	(0.0772)
ML*birth order>=2		**0.0536****					
		(0.0241)					
ML*birth order 2			0.0239	0.0913	0.0177	0.0240	0.0218
			(0.0261)	(0.108)	(0.0270)	(0.0260)	(0.0261)
ML*birth order>=3			**0.0702*****	**0.191****	**0.0574***	**0.0699****	**0.0636****
			(0.0272)	**(0.0867)**	**(0.0302)**	**(0.0272)**	**(0.0272)**
Fraction of seats with close inter-religious elections	-0.0103	-0.0106	-0.0110	-0.0113	-0.0162	-0.0109	-0.0110
	(0.0170)	(0.0170)	(0.0170)	(0.0412)	(0.0194)	(0.0171)	(0.0170)
Birth order 2	0.00431***	0.00100	0.00289	-0.00755	0.00380	0.00258	0.00310
	(0.00161)	(0.00214)	(0.00226)	(0.00819)	(0.00236)	(0.00226)	(0.00226)
Birth order>=3	0.000453	-0.00293	-0.00401	-0.0141**	-0.00408	-0.00477*	-0.00180
	(0.00199)	(0.00237)	(0.00252)	(0.00716)	(0.00280)	(0.00248)	(0.00234)
Observations	861010	861010	861010	145145	715865	861010	861010
Mean of dependent variable	0.475	0.475	0.475	0.480	0.474	0.475	0.475

*** p<0.01, ** p<0.05, * p<0.10. Standard errors in parentheses, clustered at district level. Coefficients are from 2SLS regressions, controlling for district and child year-of-birth fixed effects, quadratic polynomials in the vote margins, party identity of politicians and mother characteristics (mother's year-of-birth fixed effects, dummies for rural residence, Scheduled Caste, Scheduled Tribe, Muslim, Other Backward Caste, education levels of mother, categorical variables for mother height and age at marriage). Regressions exclude the state of Jammu & Kashmir.

Table 3
Legislator Religion and Sex-Selective Abortion: Robustness Tests

Dependent variable: Dummy for the birth of a girl child *(mean 0.475 and standard deviation 0.499).*

	(1)	(2)	(3)	(4)	(5)
	State*year FE	District-specific trends	Include Jammu & Kashmir	Districts that ever had a close inter-religious election	District-years with close inter-religious elections
Fraction Muslim legislators (ML)	-0.0778	-0.0768	-0.0690	-0.0640	-0.0136
	(0.0821)	(0.0828)	(0.0867)	(0.0686)	(0.505)
ML*birth order 2	0.0256	0.0254	0.0377	0.0182	0.126
	(0.0259)	(0.0260)	(0.0277)	(0.0389)	(0.122)
ML*birth order>=3	**0.0734*** **	**0.0740*** **	**0.0795*** **	**0.0534***	**0.0747**
	(0.0271)	**(0.0270)**	**(0.0272)**	**(0.0312)**	**(0.0904)**
Fraction of seats with close	-0.00456	-0.0208	-0.0157	-0.0130	-0.000494
inter-religious elections	(0.0169)	(0.0189)	(0.0163)	(0.0152)	(0.0792)
Birth order 2	0.00280	0.00282	0.00138	0.00402	-0.0234
	(0.00226)	(0.00227)	(0.00283)	(0.00445)	(0.0262)
Birth order>=3	-0.00397	-0.00431*	-0.00619**	-0.000207	-0.0113
	(0.00251)	(0.00252)	(0.00303)	(0.00399)	(0.0205)
Observations	861010	861010	893699	474339	91558

*** p<0.01, ** p<0.05, * p<0.10. Standard errors in parentheses, clustered at district level in all columns except 4 and 5, where they are clustered at the district-election level. Coefficients are from 2SLS regressions, controlling for district and year-of-birth fixed effects, quadratic polynomials in the vote margins (linear in column 6), party identity of politicians and mother characteristics (mother's year-of-birth fixed effects, dummies for rural residence, Scheduled Caste, Scheduled Tribe, Muslim, Other Backward Caste, education levels of mother, categorical variables for mother height and age at marriage). Regressions exclude the state of Jammu & Kashmir except when specified. Close inter-religious elections defined as those with vote margin of 3 percentage points or less.

Table 4
Legislator Religion and Fertility

Dependent variable: Whether there is any birth in that year

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Pooled birth order	Order 2+	Order 2, 3+	Order 2, 3+; NFHS 2	Order 2, 3+; NFHS 4	Drop mother height and age at marriage	Drop all mother characteristics
Fraction Muslim	-0.0163	-0.0928	-0.0858	0.142	-0.0934	-0.0927	-0.153*
legislators (ML)	(0.0587)	(0.0597)	(0.0597)	(0.197)	(0.0606)	(0.0642)	(0.0824)
ML*birth order>=2		**0.103*****					
		(0.0353)					
ML*birth order 2			0.0476	0.0474	0.0561*	0.0592*	0.144***
			(0.0325)	(0.0799)	(0.0315)	(0.0320)	(0.0525)
ML*birth order>=3			**0.104*****	**0.198*****	**0.112*****	**0.0990*****	**0.179*****
			(0.0379)	**(0.0770)**	**(0.0377)**	**(0.0348)**	**(0.0394)**
Fraction of seats with close	-0.0167	-0.0161	-0.0178	-0.0205	-0.0110	-0.0174	-0.0207
inter-religious elections	(0.0179)	(0.0176)	(0.0173)	(0.0290)	(0.0186)	(0.0183)	(0.0190)
Observations	5162556	5162556	5162556	930695	4231861	5162556	5162803
Mean of dependent variable	0.164	0.164	0.164	0.154	0.166	0.164	0.164

*** p<0.01, ** p<0.05, * p<0.10. Standard errors in parentheses, clustered at district level. Coefficients are from 2SLS regressions, controlling for district and child year-of-birth fixed effects, quadratic polynomials in the vote margins, party identity of politicians and mother characteristics (mother's year-of-birth fixed effects, dummies for rural residence, Scheduled Caste, Scheduled Tribe, Muslim, Other Backward Caste, education levels of mother, categorical variables for mother height and age at marriage) and time since last birth. Regressions exclude the state of Jammu & Kashmir.

Table 5
Legislator Religion and Fertility at Birth Order 4 and Higher

Dependent variable: Whether there is any birth in that year

	(1)	(2)	(3)	(4)	(5)
	Order 2, 3, 4+	Order 2, 3, 4+; NFHS2	Order 2, 3, 4+; NFHS4	Drop mother height and age at marriage	Drop all mother characteristics
Fraction Muslim	-0.0882	0.140	-0.0963	-0.0959	-0.161*
legislators (ML)	(0.0600)	(0.195)	(0.0608)	(0.0646)	(0.0835)
ML*birth order 2	0.0476	0.0453	0.0563*	0.0596*	0.146***
	(0.0324)	(0.0793)	(0.0313)	(0.0318)	(0.0523)
ML*birth order 3	**0.119*** **	**0.154***	**0.135*** **	**0.121*** **	**0.206*** **
	(0.0408)	**(0.0837)**	**(0.0412)**	**(0.0376)**	**(0.0440)**
ML*birth order>=4	**0.102*** **	**0.209*** **	**0.108*** **	**0.0988*** **	**0.189*** **
	(0.0381)	**(0.0763)**	**(0.0375)**	**(0.0352)**	**(0.0407)**
Fraction of seats with close	-0.0175	-0.0198	-0.0110	-0.0172	-0.0197
inter-religious elections	(0.0173)	(0.0286)	(0.0186)	(0.0182)	(0.0191)
Observations	5162556	930695	4231861	5162556	5162803
Mean of dependent variable	0.164	0.154	0.166	0.164	0.164

*** p<0.01, ** p<0.05, * p<0.10. Standard errors in parentheses, clustered at district level. Coefficients are from 2SLS regressions, controlling for district and child year-of-birth fixed effects, quadratic polynomials in the vote margins, party identity of politicians and mother characteristics (mother's year-of-birth fixed effects, dummies for rural residence, Scheduled Caste, Scheduled Tribe, Muslim, Other Backward Caste, education levels of mother, categorical variables for mother height and age at marriage) and time since last birth. Regressions exclude the state of Jammu & Kashmir.

Table 6
Legislator Identity and Gender of Childhood Mortality

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable -->	Full sample		NFHS-2		NFHS-4	
	Infant death was a girl child	Neonatal death was a girl child	Infant death was a girl child	Neonatal death was a girl child	Infant death was a girl child	Neonatal death was a girl child
Fraction Muslim	-0.0787	0.150	1.400	0.703	-0.167	0.0693
legislators (ML)	(0.318)	(0.476)	(2.216)	(1.484)	(0.325)	(0.488)
ML*birth order 2	-0.00210	0.154	0.0457	0.161	-0.00943	0.145
	(0.0972)	(0.123)	(0.379)	(0.431)	(0.104)	(0.128)
ML*birth order>=3	**0.144***	**0.185***	**0.0849**	**0.00492**	**0.155***	**0.187***
	(0.0823)	**(0.106)**	**(0.283)**	**(0.327)**	**(0.0823)**	**(0.107)**
Fraction of seats with close	-0.0435	-0.0343	-0.0448	-0.0104	-0.0456	-0.0543
inter-religious elections	(0.0620)	(0.0706)	(0.181)	(0.165)	(0.0702)	(0.0776)
Birth order 2	0.0405***	0.0204**	0.0285	0.00391	0.0422***	0.0246**
	(0.00836)	(0.0103)	(0.0255)	(0.0312)	(0.00929)	(0.0111)
Birth order>=3	0.0592***	0.0458***	0.0620***	0.0407	0.0563***	0.0482***
	(0.00844)	(0.0105)	(0.0232)	(0.0277)	(0.00882)	(0.0111)
Observations	53675	36796	11868	7700	41807	29096

*** p<0.01, ** p<0.05, * p<0.10. Standard errors in parentheses, clustered at district level. Coefficients are from 2SLS regressions, controlling for district and child year-of-birth fixed effects, quadratic polynomials in the vote margins, party identity of politicians and mother characteristics (mother's year-of-birth fixed effects, dummies for rural residence, Scheduled Caste, Scheduled Tribe, Muslim, Other Backward Caste, education levels of mother, categorical variables for mother height and age at marriage). Regressions exclude the state of Jammu & Kashmir.

Table 7
Differential Effects of Legislator Identity by Gender of First Birth

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Girl birth		Any birth		Infant death was a girl		Neonatal death was a	
	First child is a girl	First child is a boy	First child is a girl	First child is a boy	First child is a girl	First child is a boy	First child is a girl	First child is a boy
ML*birth order 2	-0.131	0.155	-0.0525	-0.117**	0.127	-0.149	0.948	0.504
	(0.134)	(0.124)	(0.0666)	(0.0580)	(0.535)	(0.490)	(0.744)	(0.723)
ML*birth order>=3	**0.0559**	**0.0324**	**0.0770****	**0.0361**	**0.214**	**0.0324**	**0.108**	**-0.118**
	(0.0342)	**(0.0466)**	**(0.0316)**	**(0.0280)**	**(0.181)**	**(0.112)**	**(0.223)**	**(0.134)**
Fraction of seats with close inter-religious elections	0.00895	-0.00458	-0.0186	-0.0168	0.0490	-0.0738	0.0655	-0.0420
	(0.0292)	(0.0254)	(0.0149)	(0.0178)	(0.104)	(0.0827)	(0.148)	(0.109)
Observations	315744	303099	1880595	2301348	13156	25696	8705	16937

ML refers to fraction Muslim legislators in the district. *** p<0.01, ** p<0.05, * p<0.10. Standard errors in parentheses, clustered at district level. Coefficients are from 2SLS regressions, controlling for district and child year-of-birth fixed effects, quadratic polynomials in the vote margins, party identity of politicians and mother characteristics (mother's year-of-birth fixed effects, dummies for rural residence, Scheduled Caste, Scheduled Tribe, Muslim, Other Backward Caste, education levels of mother, categorical variables for mother height and age at marriage). Regressions exclude the state of Jammu & Kashmir. Columns 3-4 control for time since last birth.

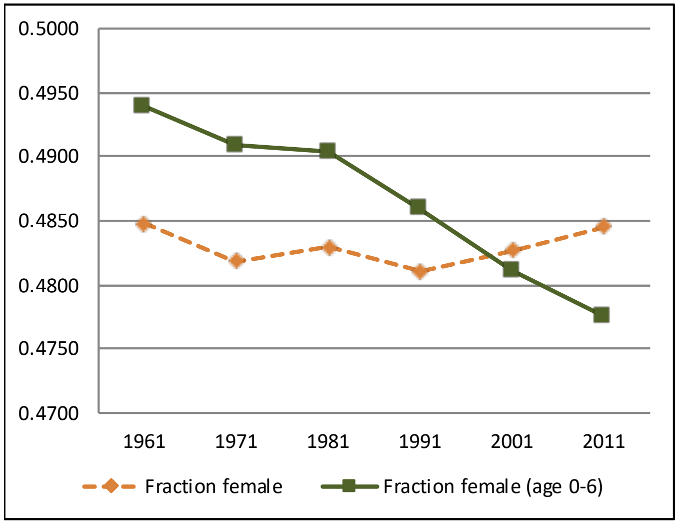
Table 8
Women Legislators and Birth Outcomes

	(1)	(2)	(3)	(4)
Dependent variable -->	Girl birth	Any birth	Infant death was a girl child	Neonatal death was a girl child
Fraction women legislators (WL)	0.0396	0.0737	-0.0397	0.686
	(0.126)	(0.0973)	(0.529)	(0.695)
WL*birth order 2	0.0665	-0.125***	-0.0732	-0.0584
	(0.0439)	(0.0436)	(0.195)	(0.266)
WL*birth order>=3	**0.0225**	**-0.189*** **	**0.0912**	**0.111**
	(0.0496)	**(0.0478)**	**(0.192)**	**(0.235)**
Fraction seats with	0.000939	-0.000605	-0.0375	0.0280
close mixed-gender elections	(0.0159)	(0.0114)	(0.0691)	(0.0934)
Birth order 2	0.000457	0.0280***	0.0445***	0.0332**
	(0.00307)	(0.00380)	(0.0130)	(0.0167)
Birth order>=3	-0.000807	-0.0629***	0.0633***	0.0506***
	(0.00344)	(0.00469)	(0.0127)	(0.0154)
Observations	861010	5162556	53675	36796

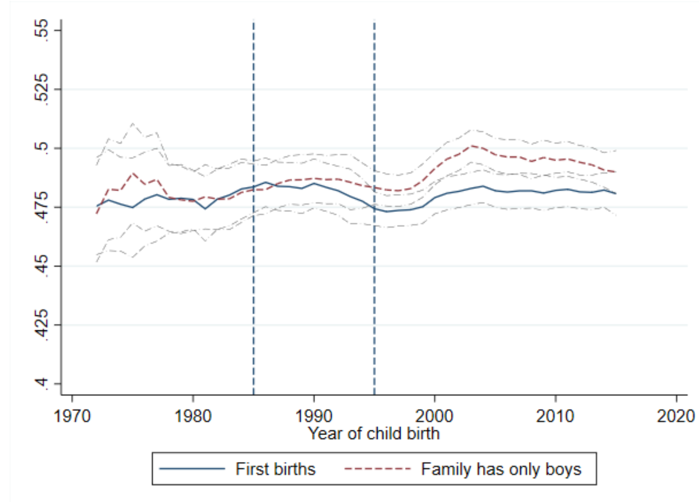
*** p<0.01, ** p<0.05, * p<0.10. Standard errors in parentheses, clustered at district level. Coefficients are from 2SLS regressions, controlling for district and child year-of-birth fixed effects, quadratic polynomials in the vote margins, party identity of politicians and mother characteristics (mother's year-of-birth fixed effects, dummies for rural residence, Scheduled Caste, Scheduled Tribe, Muslim, Other Backward Caste, education levels of mother, categorical variables for mother height and age at marriage). Regressions exclude the state of Jammu & Kashmir. Column 2 includes a control for time since last birth.

Figure 1
Sex Ratio Trends in India (Fraction of Females)

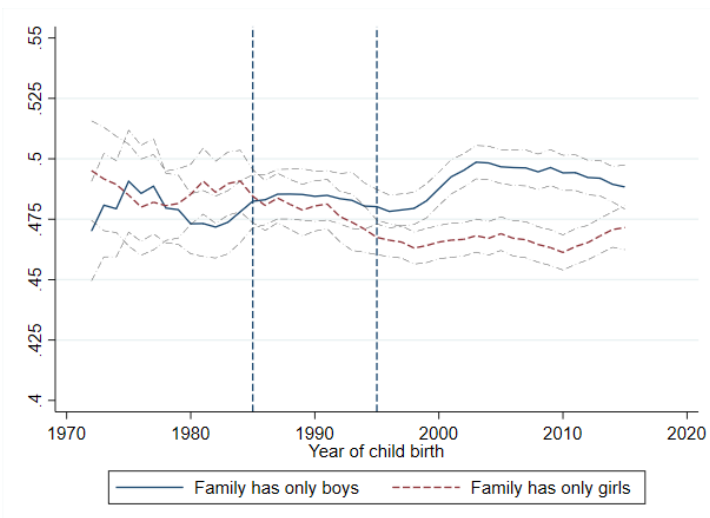
A: Total and 0-6 Years (Census Data)



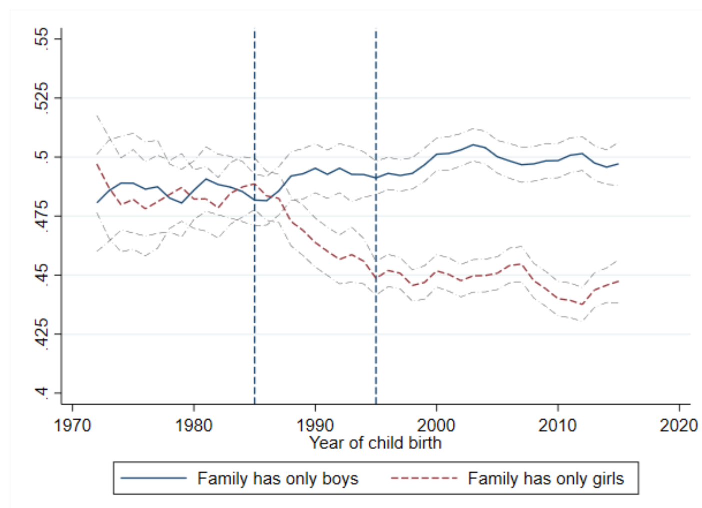
B. Fraction females at birth



C. Second births



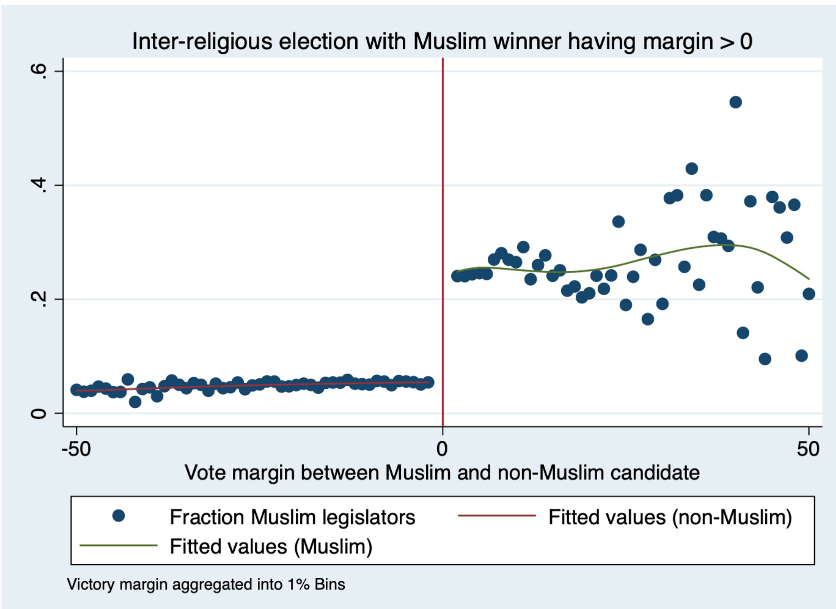
D. Third and higher order births



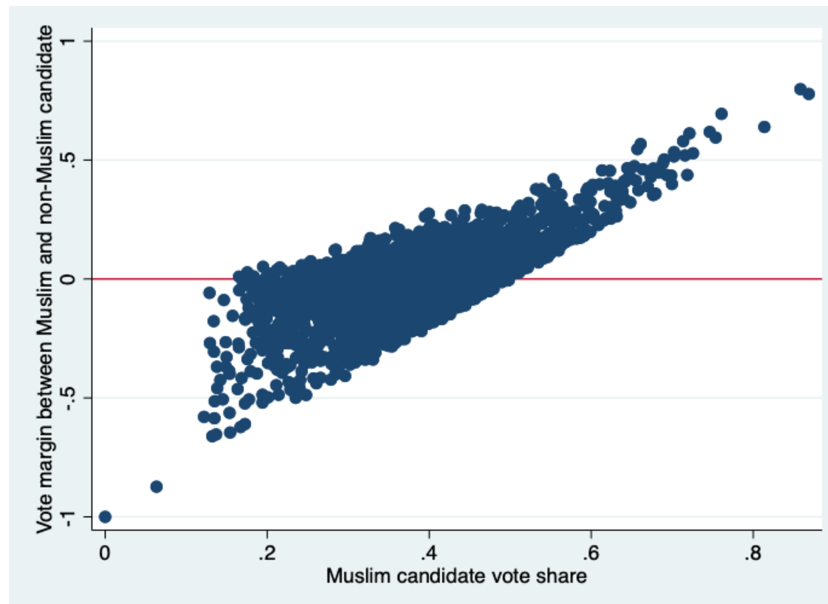
Panel A based on census reports; Panels B, C and D are five-year moving averages based on NFHS data from Bhalotra, Cochrane and Tam (2021).

Figure 2
Instrumental Variables Strategy Based on Close Elections

A. "First Stage" of Instrumental Variables Strategy



B. Muslim Candidate Vote Share across Different Vote Margins

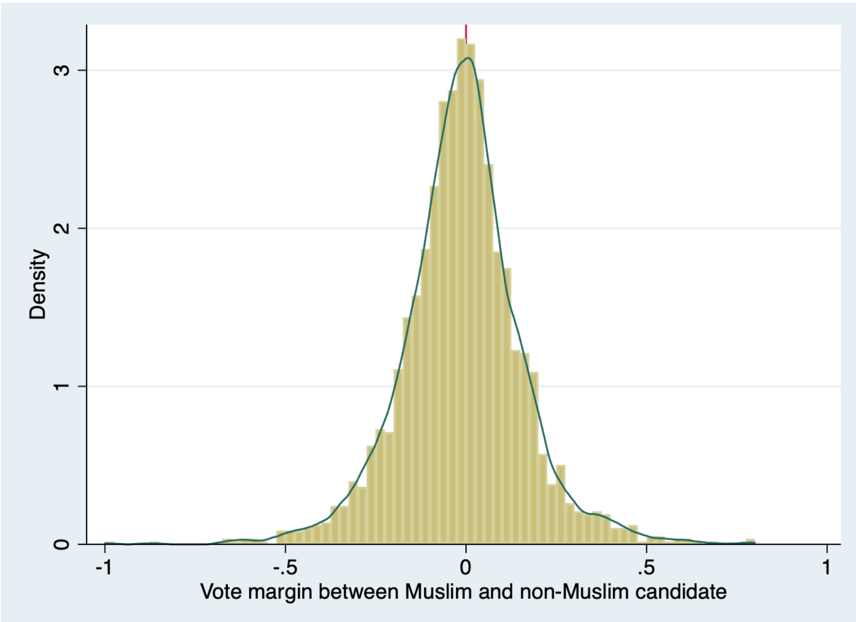


Notes to Figure A: The x-axis shows the constituency-level victory margin between Muslims and non-Muslims, defined as the vote share of Muslim candidate(s) minus vote share of non-Muslim candidate(s) so that a positive margin is associated with a Muslim winning a legislative assembly seat. The y-axis shows the district-level fraction of Muslim legislators.

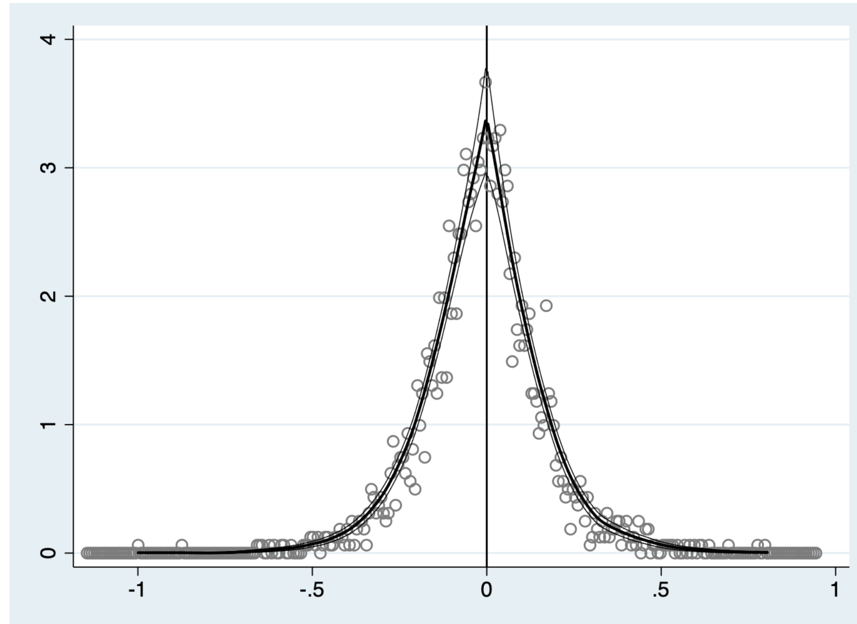
Notes to Figure B: Figure uses constituency-level data on the overall vote share obtained by the Muslim candidate (x-axis) and the margin of victory between a Muslim and non-Muslim candidate (y-axis). Figure is for constituencies that had inter-religious elections i.e. a Muslim and non-Muslim candidate as the top two votegetters. The Muslim candidate wins when the vote margin is greater than zero, and loses when the vote margin is less than zero.

Figure 3
Continuity of the Vote Margin between Muslims and non-Muslims

A. Density of the victory margin



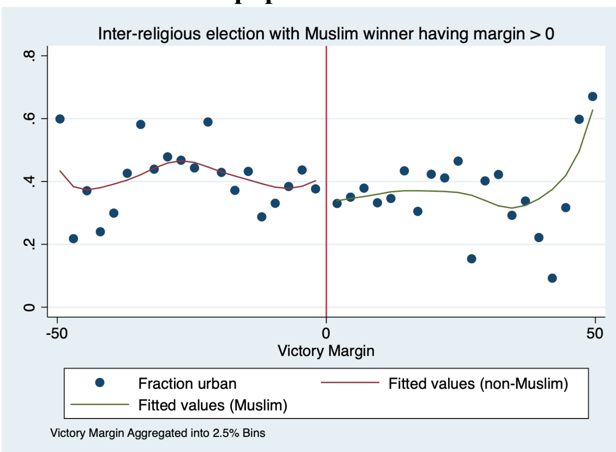
B. Testing for density discontinuities at zero (McCrary test)



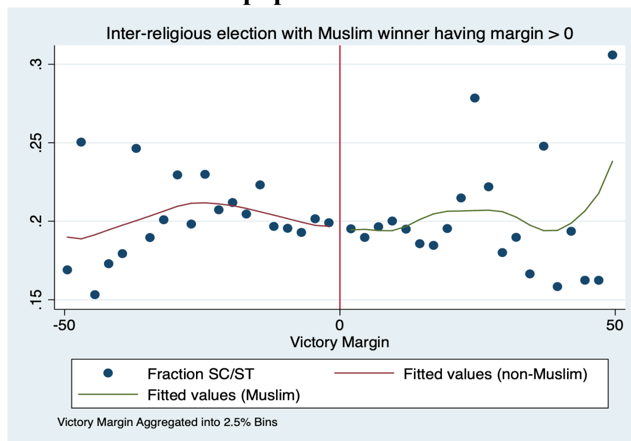
Notes: Sample restricted to elections where a Muslim and a non-Muslim were the top two vote-getters.
Discontinuity estimate in Figure B (log difference in height): -0.0038 (standard error = 0.0919)

Figure 4: Continuity in Demographic Characteristics

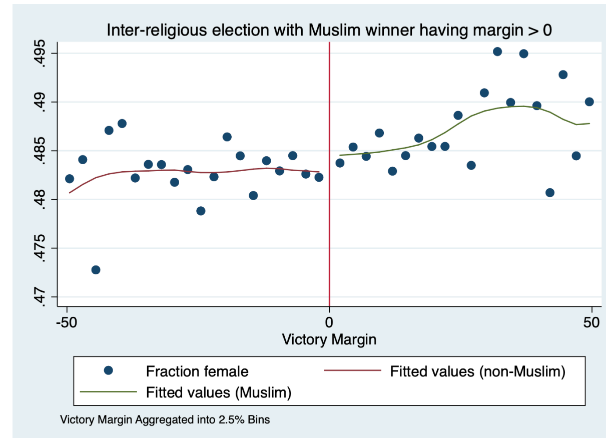
A. Fraction urban population



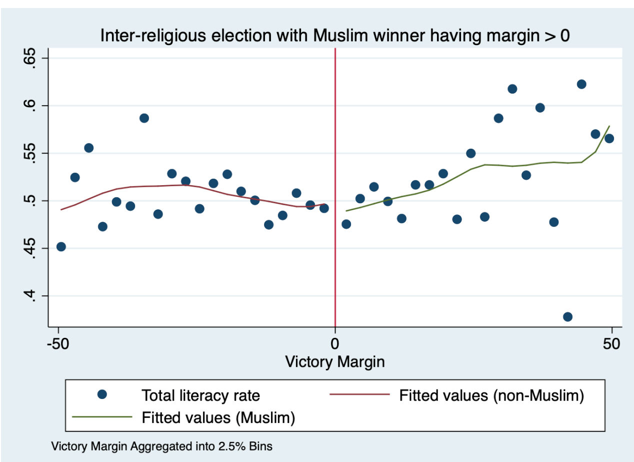
B. Fraction SC/ST population



C. Fraction female



D. Fraction literate



E. Fraction Muslims

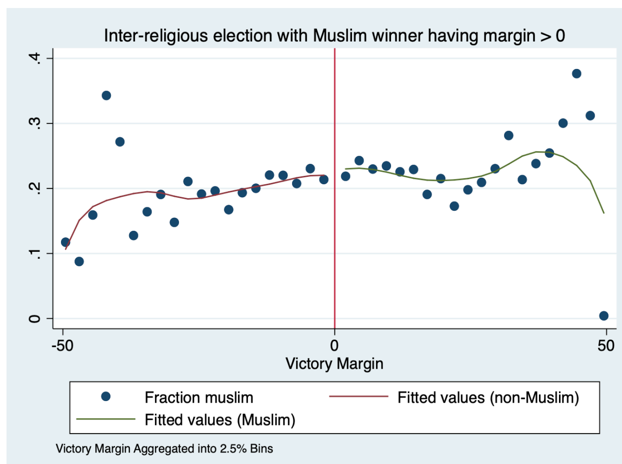
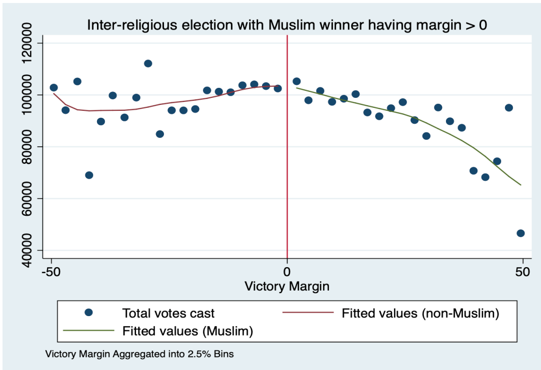
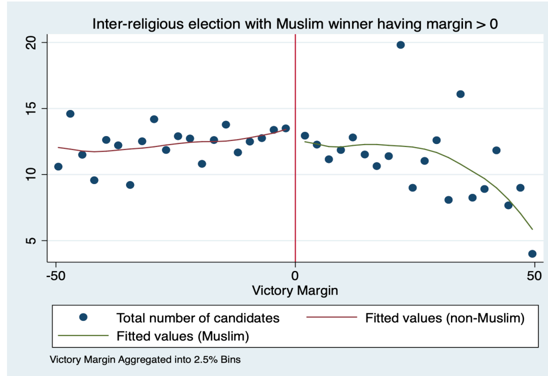


Figure 5: Continuity in Political Characteristics

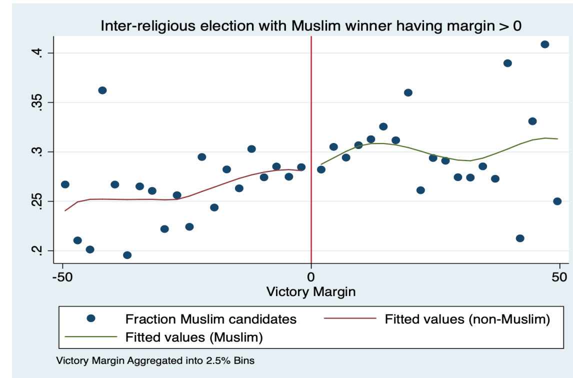
A: Total votes cast



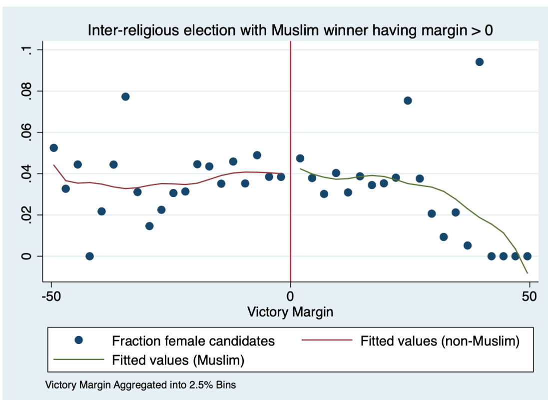
B: Number of candidates



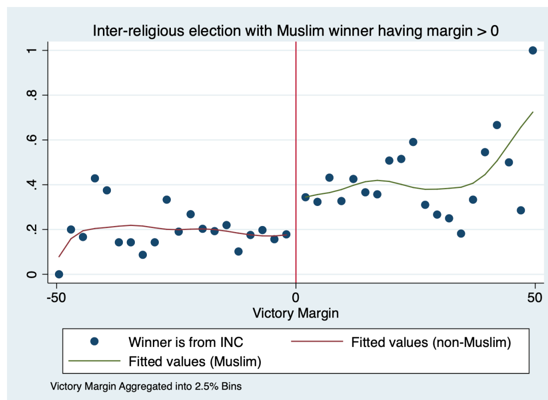
C: Fraction of Muslim candidates



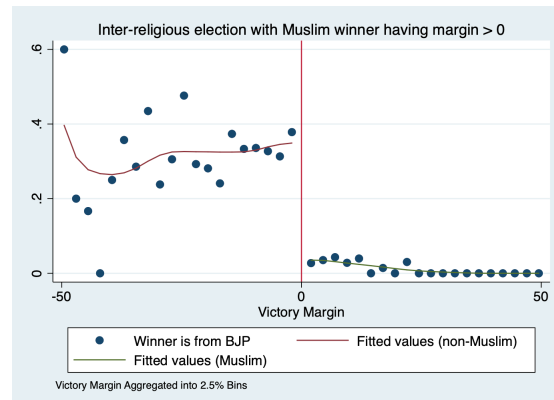
D: Fraction female candidates



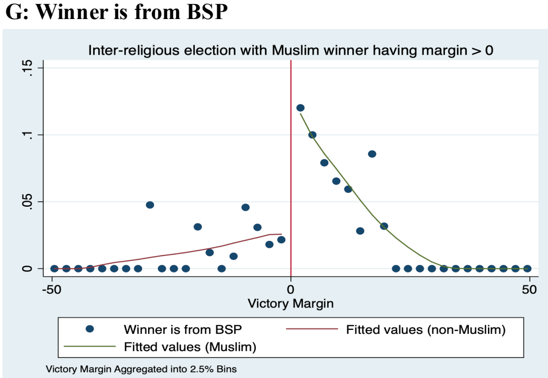
E: Winner is from Congress



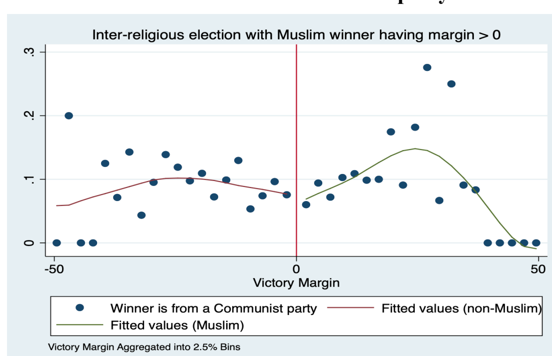
F: Winner is from BJP



G: Winner is from BSP



H: Winner is from a Communist party



I: Winner is an incumbent

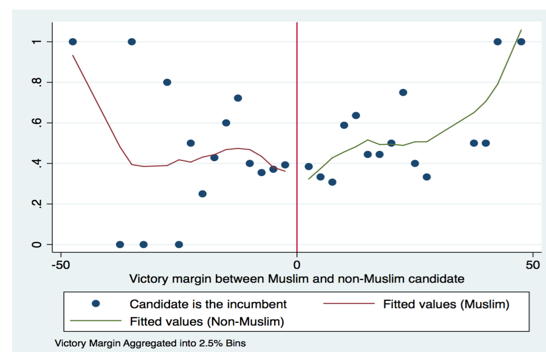
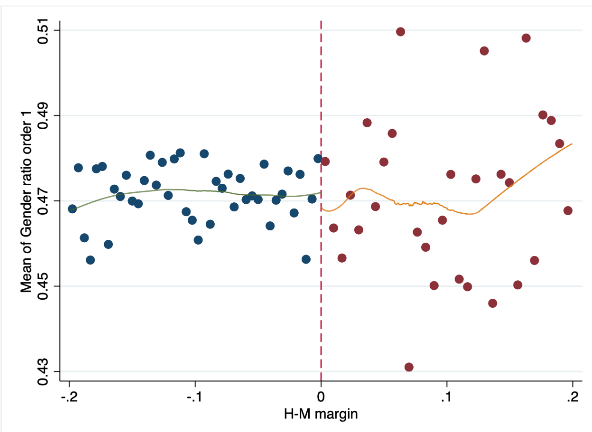
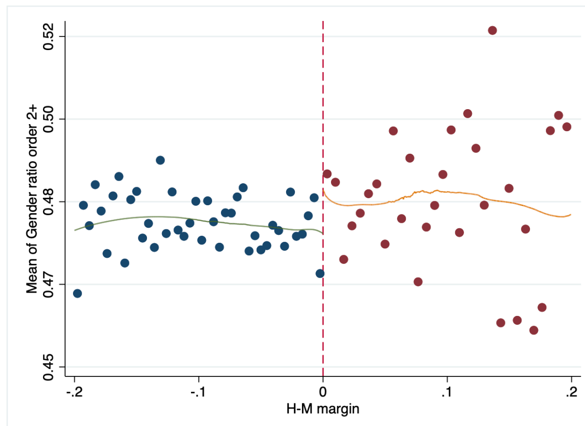


Figure 6
Illustration of the Reduced Form regression

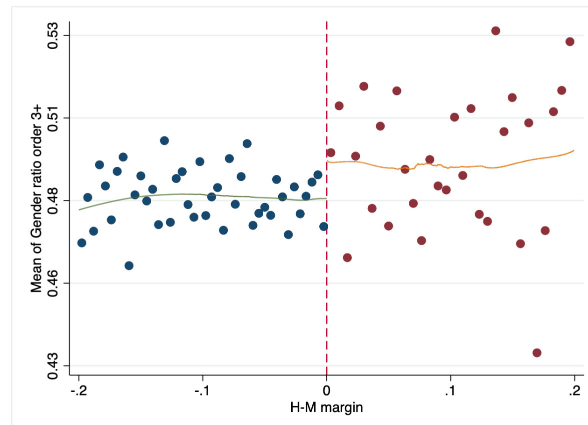
A. Birth order 1



B. Birth order 2 and higher



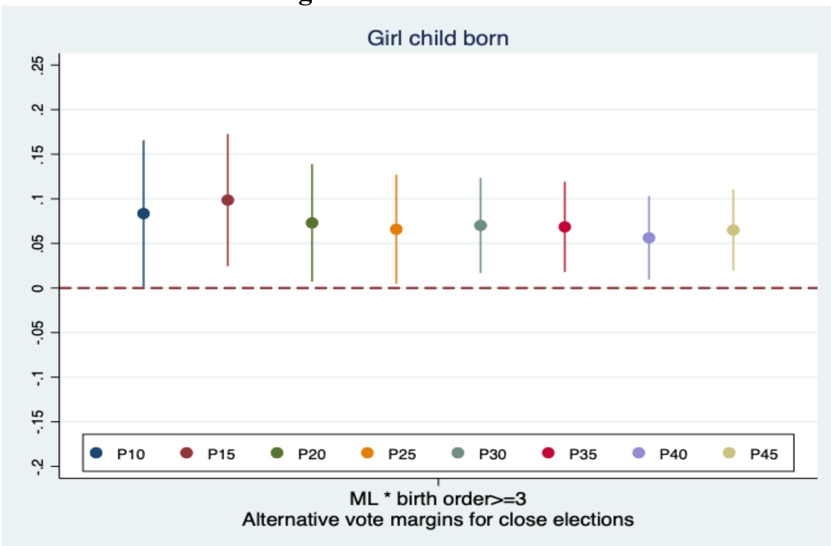
C. Birth order 3 and higher



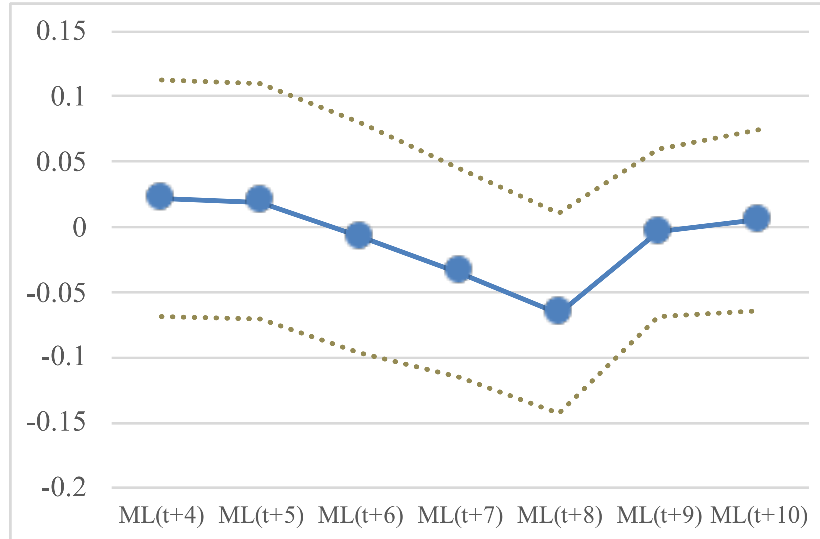
The x-axis shows the constituency-level victory margin between Muslims and non-Muslims, defined as the vote share of Muslim candidate(s) minus vote share of non-Muslim candidate(s) so that a positive margin is associated with a Muslim winning a legislative assembly seat. The y-axis shows the district-level fraction births that are female at different birth parities.

Figure 7: Robustness of Sex-Selection Coefficients

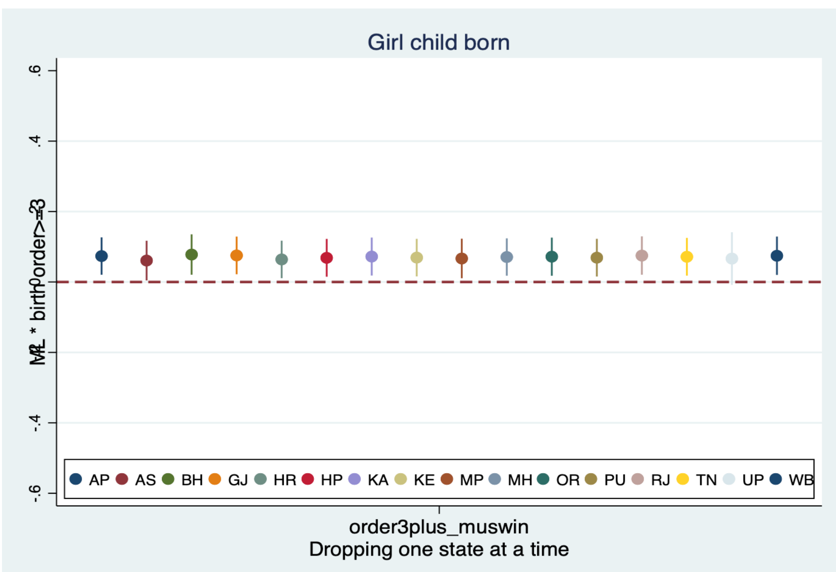
A. Alternative vote margins for close elections



B. Effect of Muslim representation in the future



C. Robustness to dropping one state at a time



Each point in the figures represents the coefficient on Muslim Legislator (ML) * birth order>=3 from a 2SLS regression. 95% confidence intervals for the coefficients are also displayed. The dependent variable is a dummy that equals one if the child born is a girl. Coefficients are estimated using the specification of Table 2, column 3. In Panel A, we use different vote margins used to define close inter-religious elections. "P10" shows the coefficient when a vote margin of 1.0% is used to define close elections, "P15" uses 1.5% as the vote margin for close elections etc. In Panel B, ML (t+4) indicates that the explanatory variable is ML 4 years after the birth of the child, ML (t+5) indicates ML 5 years after birth of the child and so on. Each legislator's term lasts for 5 years. In Panel C, we estimate coefficients dropping one state at a time. Labels "AP", "AS" etc represent which state is dropped.

Appendix Tables and Figures

Table A1
Preferences about Gender Roles across Religions

	(1)	(2)	(3)	(4)
	World Values Surveys : Agreement with statements			
	Husband and wife should both contribute to household income.	University education is more important for a boy.	Men make better political leaders than women do.	Men make better executives than women do.
Muslim	-0.0550***	-0.00461	-0.0263	0.0489
	(0.0203)	(0.0227)	(0.0235)	(0.0429)
Dep var Mean for Non-Muslims	0.8079	0.3936	0.5690	0.6079
N	5411	4435	4344	1255
R-squared	0.019	0.070	0.055	0.037

*** p<0.01, ** p<0.05, * p<0.1. Data for column 1 is from World Values Surveys of 1990, 1995, 2001; data for columns 2 and 3 is from the 1995, 2001 and 2006 waves and for column 4 is from 2006. Dependent variables are binary and were obtained by transforming variables initially coded as integer on [1,4]. Controls include gender, age, educational category, marital status and family income category of the respondent, and dummies for year of survey.

Table A2
Summary Statistics

Panel A: Birth Outcomes and Demographics	Pooled sample		NFHS-2		NFHS-4	
	#obs	Mean	#obs	Mean	#obs	Mean
Dummy for girl birth	861,010	0.475	145145	0.480	715865	0.474
At birth order 1	242,167	0.473	32017	0.480	210150	0.472
At birth order 2	253,398	0.477	36566	0.479	216832	0.477
At birth order 3 or higher	365,445	0.476	76562	0.481	288883	0.475
Dummy for any birth	5,162,803	0.164	930942	0.154	4231861	0.166
Infant mortality (dummy for child dying in first year of life), girls	409,331	0.061	69718	0.083	339613	0.057
Infant mortality (dummy for child dying in first year of life), boys	451,679	0.064	75427	0.081	376252	0.060
Neonatal mortality (dummy for child dying in first month of life), girls	409,331	0.039	69718	0.050	339613	0.037
Neonatal mortality (dummy for child dying in first month of life), boys	451,679	0.046	75427	0.056	376252	0.044
Rural resident	861,010	0.794	145145	0.771	715865	0.798
Muslim	861,010	0.135	145145	0.137	715865	0.135
Scheduled caste	861,010	0.212	145145	0.199	715865	0.215
Scheduled tribe	861,010	0.125	145145	0.100	715865	0.130
Other backward caste	861,010	0.422	145145	0.322	715865	0.442
Fraction mothers with no education	861,010	0.569	145145	0.639	715865	0.555
Fraction mothers with primary education	861,010	0.154	145145	0.158	715865	0.154
Fraction mothers with secondary education	861,010	0.244	145145	0.160	715865	0.261
Fraction mothers with higher education	861,010	0.033	145145	0.043	715865	0.031

Panel B: Electoral Variables. District-year Level	Pooled sample		1980-1999		2000-2010	
	#obs	Mean	#obs	Mean	#obs	Mean
Fraction of seats won by Muslim legislators (ML)	11,047	0.056	7,232	0.056	3,815	0.057
Fraction of seats won by Muslims in close inter-religious elections	11,047	0.008	7,232	0.006	3,815	0.011
Fraction of seats with close inter-religious elections	11,047	0.016	7,232	0.015	3,815	0.019
Any Muslim legislator (dummy)	11,047	0.335	7,232	0.337	3,815	0.331
Any close inter-religious elections (dummy)	11,047	0.143	7,232	0.133	3,815	0.163
Any Muslim legislator who won a close inter-religious election (dummy)	11,047	0.073	7,232	0.063	3,815	0.091

Table A3

Comparing Mother Characteristics and Birth Outcomes Across Districts with and without Close Inter-Religious Elections

	Districts with no close elections	Districts with at least one close election	Difference
Mother characteristics			
Muslim	0.058	0.163	0.105 ***
Scheduled Caste	0.202	0.201	-0.001
Scheduled Tribe	0.162	0.083	-0.079 ***
Other Backward Caste	0.389	0.442	0.053 ***
Rural	0.782	0.749	-0.034 ***
No education	0.461	0.486	0.026 ***
Primary education	0.165	0.153	-0.012 ***
Secondary education	0.324	0.304	-0.020 ***
Higher education	0.051	0.057	0.006 ***
Age at interview	35.9	35.8	-0.106 ***
N	150,051	171,873	
Outcome variables			
Girl child born	0.475	0.476	0.001
N	385,172	475,838	
Any birth in a given year	0.157	0.170	0.013 ***
N	2,409,999	2,752,804	

*** indicates that the difference is statistically significant at 1% level, ** indicates significance at 5% level and * indicates significance at 10% level.

Table A4
Instrumental Variables Strategy: First Stage

Dependent variable: Fraction Muslim legislators in the district

	(1)	(2)	(3)	(4)
	Girl birth sample		Birth sample	
	Individual-level data	District-level data	Individual-level data	District-level data
Fraction of seats with Muslim legislators who won close elections against non-Muslims	0.398***	0.362***	0.441***	0.362***
	(0.094)	(0.088)	(0.091)	(0.089)
Fraction of seats with close inter-religious elections	-0.0780*	-0.104***	-0.108**	-0.103***
	(0.047)	(0.039)	(0.045)	(0.038)
Observations	861,009	11,047	5,162,556	11,058
R-squared	0.932	0.913	0.937	0.914
F-statistic	983.2	410.0	533.2	371.7
Margin of victory for close elections	3%	3%	3%	3%

*** p<0.01, ** p<0.05, * p<0.10. Standard errors in parentheses, clustered at district level. All regressions control for district and child's year-of-birth fixed effects, quadratic polynomials in the vote margins, party identity of politicians and mother characteristics (mother's year-of-birth fixed effects, dummies for rural residence, Scheduled Caste, Scheduled Tribe, Muslim, Other Backward Caste, education levels of mother, categorical variables for mother height and age at marriage). Regressions exclude the state of Jammu & Kashmir.

Table A5
Differential Effects of Legislator Identity by Religion, Age, Region and Legal Regime

Dependent variable: dummy for the birth of a girl child

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Hindus & Sikhs	Muslims	Younger women	Older women	States with worse gender ratio 1981	States with better gender ratio 1981	PC&PNDT Act in Force	PC&PNDT Act Not in Force
Fraction Muslim	-0.0115	-0.266*	-0.0966	-0.0637	-0.180*	0.160	0.00415	-2.373***
legislators (ML)	(0.0908)	(0.138)	(0.0908)	(0.157)	(0.109)	(0.128)	(0.619)	(0.699)
ML*birth order 2	-0.000235	0.114*	0.0243	0.0329	0.0294	0.0148	0.0916	0.0447
	(0.0343)	(0.0677)	(0.0310)	(0.0412)	(0.0299)	(0.0517)	(0.104)	(0.239)
ML*birth order>=3	**0.0819****	**0.0337**	**0.0774*****	**0.0891****	**0.0969*****	**0.0238**	**0.204****	**0.161**
	(0.0376)	**(0.0625)**	**(0.0284)**	**(0.0433)**	**(0.0304)**	**(0.0501)**	**(0.0930)**	**(0.157)**
Observations	691475	111835	341046	519964	547699	313311	114932	64969

*** p<0.01, ** p<0.05, * p<0.10. Standard errors in parentheses, clustered at district level. Coefficients are from 2SLS regressions, controlling for district and child year-of-birth fixed effects, quadratic polynomials in the vote margins, party identity of politicians and mother characteristics (mother's year-of-birth fixed effects, dummies for rural residence, Scheduled Caste, Scheduled Tribe, Muslim, Other Backward Caste, education levels of mother, categorical variables for mother height and age at marriage). Younger women defined as those born in 1978 (median of mother's birth year) or later. PC &PNDT Act refers to the Pre-Conception and Pre-Natal Diagnostic Techniques Act, which came into force in Maharashtra in 1988, and nationwide in 1996. Sample in column 7 is restricted to births two years prior to the reform; sample in column 8 is restricted to births two years after the reform.

Table A6
Legislator Identity and Sex-Selective Abortion: Additional Robustness Tests

Dependent variable: Dummy for the birth of a girl child (mean = 0.475)

	(1)	(2)	(3)	(4)
	Baseline specification (Table 2, column 3)	Without vote margin polynomials	Without party identity controls	OLS specification
Fraction Muslim legislators (ML)	-0.0671	-0.00823	-0.0128	-0.0423**
	(0.0769)	(0.0384)	(0.0368)	(0.0197)
ML*birth order 2	0.0239	0.0236	0.0234	0.0114
	(0.0261)	(0.0261)	(0.0261)	(0.0147)
ML*birth order>=3	**0.0702*** **	**0.0674** **	**0.0669** **	**0.0455*** **
	(0.0272)	**(0.0272)**	**(0.0273)**	**(0.0157)**
Fraction of seats with close inter-religious elections	-0.0110	-0.00639	-0.00716	-0.0115
	(0.0170)	(0.0161)	(0.0161)	(0.0163)
Observations	861010	861010	861010	861010

*** p<0.01, ** p<0.05, * p<0.10. Standard errors in parentheses, clustered at district level. Coefficients are from 2SLS regressions (except when specified otherwise), controlling for district and child year-of-birth fixed effects, quadratic polynomials in the vote margins, party identity of politicians and mother characteristics (mother's year-of-birth fixed effects, dummies for rural residence, Scheduled Caste, Scheduled Tribe, Muslim, Other Backward Caste, education levels of mother, categorical variables for mother height and age at marriage). Regressions exclude the state of Jammu & Kashmir.

Table A7
Legislator Religion and Violence Against Women

Panel A: Domestic Violence - Incidence and Attitudes (Self-Reported)

	(1)	(2)	(3)	(4)
	No beatings	Beaten many times	Beating acceptable (any reason)	Beating acceptable (all reasons)
Fraction Muslim	0.217	0.0650	-0.431	-0.224
legislators (ML)	(0.388)	(0.231)	(0.603)	(0.450)
Observations	43521	43521	97897	97897
Mean of dependent variable	0.670	0.066	0.425	0.196

Standard errors in parantheses, clustered at district level. Data are from NFHS2 and NFHS-4 women respondents. The coefficients are from 2SLS regressions, controlling for party identity of legislators, fraction of close inter-religious elections in the district, quadratic polynomials in the victory margin, individual demographics and state*year of interview fixed effects. Dependent variables are dummy variables defined as follows: (1) equal to one if respondent reports not being beaten or experiencing physical violence in the last 12 months; (2) equals one if respondent reports being beaten or experiencing physical violence "many times" in the last 12 months; (3) equals one if the respondent agrees that it is acceptable for a husband to beat his wife for any one of the following reasons: if he suspects her of being unfaithful or if she shows disrespect; (4) equals one if the respondent agrees that it is acceptable to beat the wife for both of these reasons.

Panel B: Crimes Against Women (Police Reports)

	(1)	(2)	(3)	(4)	(5)	(6)
	Rape	Kidnapping of women and girls	Sexual assault	Sexual harassment	Domestic violence	Dowry deaths
Fraction Muslim	0.229	-0.104	-0.477	-1.305	-0.842	-0.373
legislators (ML)	(0.474)	(0.392)	(0.625)	(0.944)	(0.890)	(0.577)
Observations	8985	6494	4376	3283	4337	4046

Standard errors in parantheses, clustered at district level. The coefficients are from 2SLS regressions, controlling for district and year fixed effects, district population and literacy rates, party identity of legislators, fraction of close inter-religious elections in the district and quadratic polynomials in the victory margin. Dependent variables are log(# of reported crimes per 100,000 women). Crime data obtained from National Crime Records Bureau for 1980-2008.

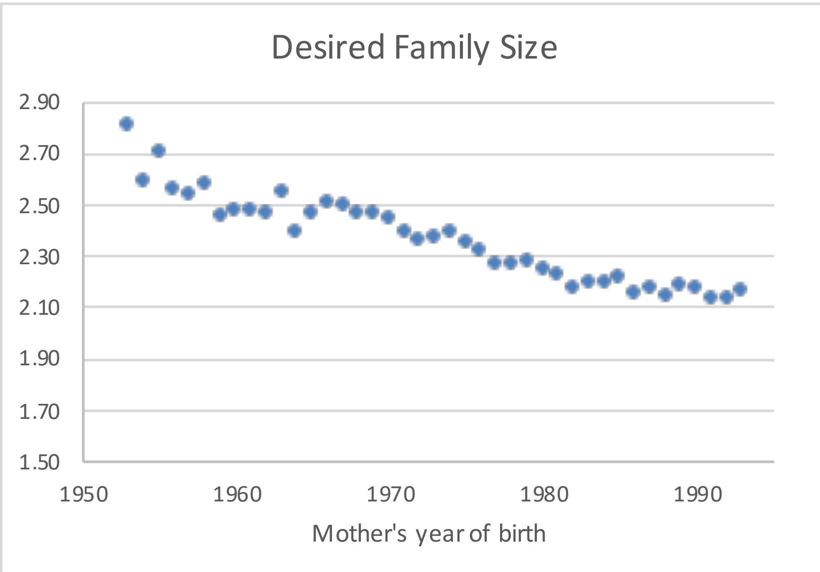
Table A8
Legislator Religion and Change in Gender Preferences

	(1)	(2)	(3)	(4)	(5)
Dependent variable -->	Ideal share of boys	Girl birth (3+ years later)	Girl birth (4+ years later)	Girl birth (6+ years later)	Girl birth (10+ years later)
Fraction Muslim legislators when mother was age 20 (ML20)	-0.00639				
	(0.0339)				
Fraction Muslim legislators (ML)		-0.0411	-0.249	-0.483	-0.282
		(0.173)	(0.240)	(0.369)	(0.394)
ML*birth order 2		-0.0120	-0.0152	-0.0408	-0.0125
		(0.0203)	(0.0212)	(0.0270)	(0.0313)
ML*birth order>=3		-0.0303	-0.0739**	-0.0713*	0.0192
		(0.0247)	(0.0307)	(0.0412)	(0.0446)
Fraction seats with close mixed-gender elections	0.00217	0.0321	0.0307	0.0240	0.0159
	(0.0396)	(0.0255)	(0.0285)	(0.0355)	(0.0433)
Observations	239214	736461	690923	599893	417308

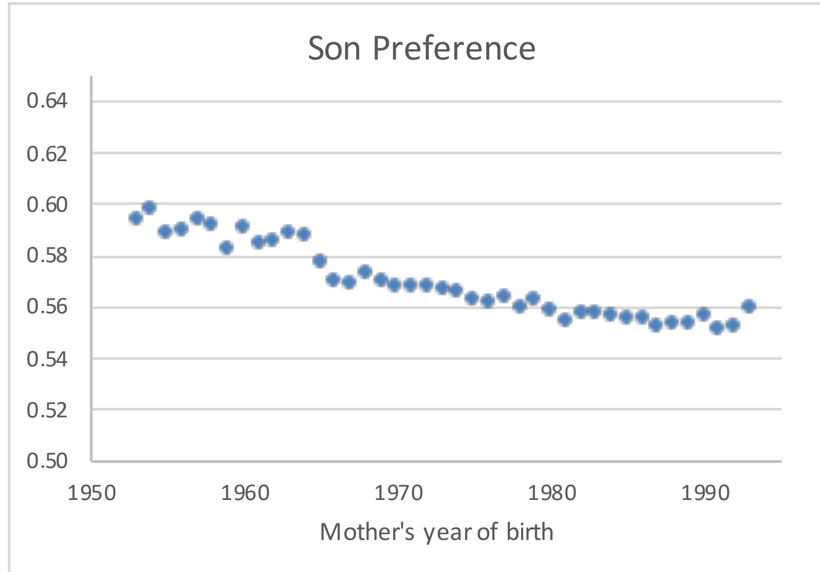
*** p<0.01, ** p<0.05, * p<0.10. Standard errors in parentheses, clustered at district level. Coefficients are from 2SLS regressions. Column 1 controls for age of respondent (and its square), education level, rural residence, caste identity, year of marriage categories and state fixed effects. Columns 2-5 control for district and child year-of-birth fixed effects, quadratic polynomials in the vote margins, party identity of politicians and mother characteristics (mother's year-of-birth fixed effects, dummies for rural residence, Scheduled Caste, Scheduled Tribe, Muslim, Other Backward Caste, education levels of mother, categorical variables for mother height and age at marriage).

Figure A1
Trends in Desired Fertility and Son Preference

A. Stated ideal family size

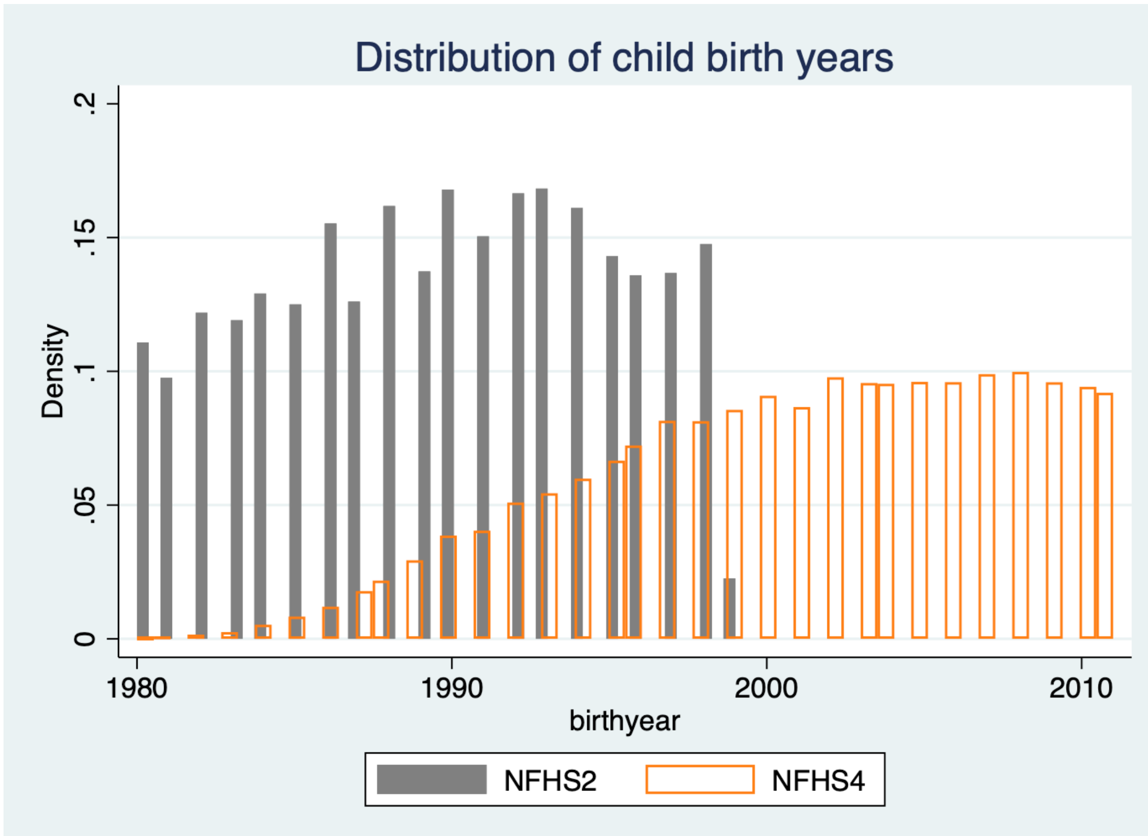


B. Stated share of boys among desired children



Data from our regression sample based on NFHS2 and NFHS4. Lowest 1% (born before 1953) and highest 1% (born after 1993) of mother cohorts excluded from the graph. Desired family size computed as the sum of responses to questions about ideal number of boys and ideal number of girls. Son preference computed as the ideal number of boys as a share of desired family size.

Figure A2
Distribution of Birth Years Across Survey Waves



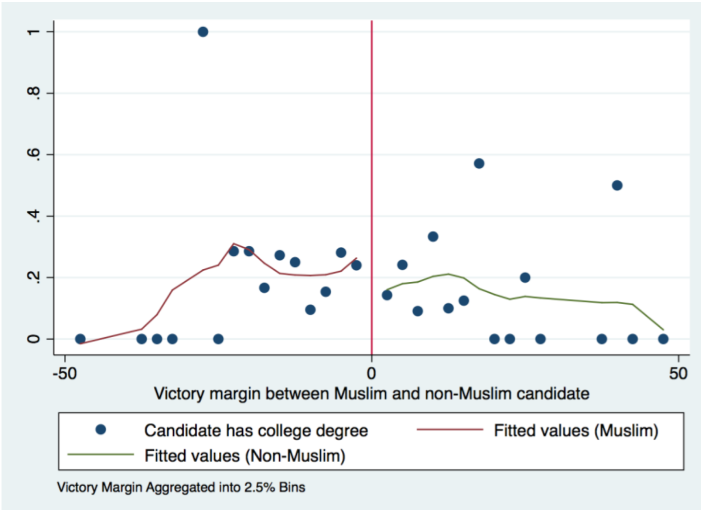
Data from our regression sample of Table 2, drawn from NFHS2 and NFHS4.

Figure A3
Electoral Constituencies and Administrative Districts

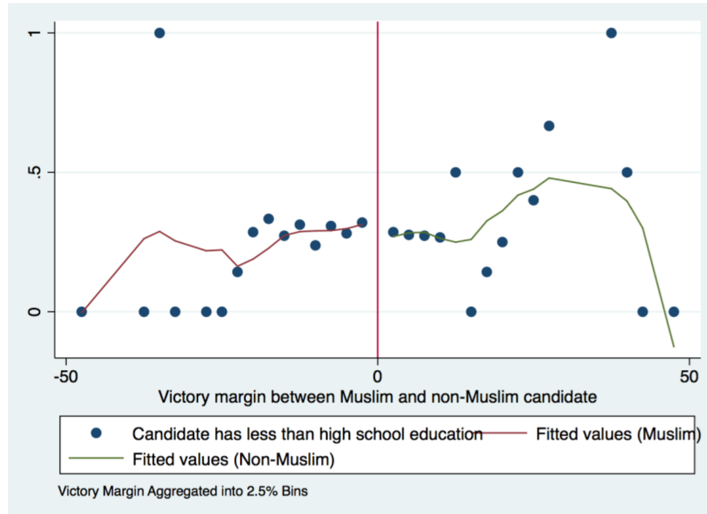
Source: http://www.uttarpradesh.election2017results.in/ghaziabad/loni_uttar_pradesh_assembly_election_2017.html

Figure A4: Continuity in Candidate Characteristics

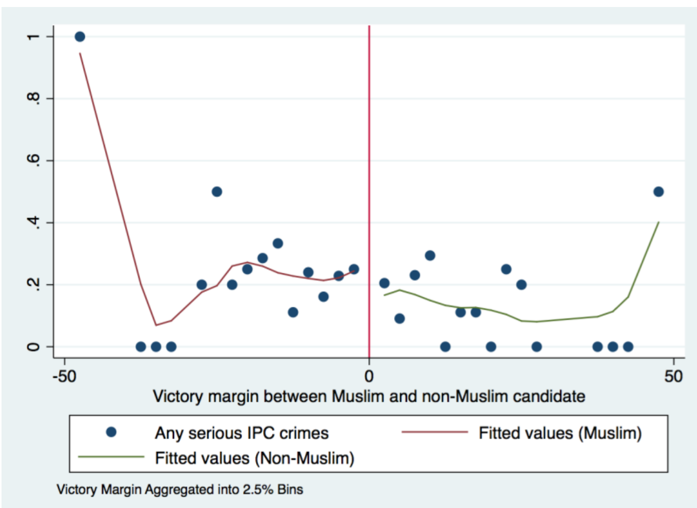
A: Candidate is college-educated



B: Candidate did not complete high school



C: Any serious criminal charge filed against candidate



D. Log net worth of candidate