Gender Differences in Political Career Progression*

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Abstract

We quantify the gender gap in political career progression from state to national levels among U.S. politicians and study its underlying causes. Using a close elections strategy, we find that an additional state legislature term increases the probability of ever running for Congress by twice as much for men as it does for women in otherwise comparable elections. The effect on winning a Congressional race is four times larger for men than women. These gaps emerge early in legislators' careers, widen over time, and are seen alongside a higher propensity of female politicians to continue running for the state legislature. The gap cannot be attributed to differences in experience, career-family tradeoffs, election or constituency characteristics, nor preferences for part-time public service careers.

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I. Introduction

The underrepresentation of women in high-status occupations persists worldwide, even in countries that have made significant progress towards gender equality (Bertrand et al. 2018). This is particularly true in politics, where the share of women at the highest levels of government is well below their share of the population in nearly all countries (CAWP 2017).[1,2] These gender gaps exist even in contexts where women have an equal likelihood of winning elections conditional on candidacy. For example, despite the underrepresentation of women in the U.S. Congress, it has been well established that the gender of a Congressional candidate has little impact on the amount of campaign funds raised, the vote share won by the candidate, or a candidate's probability of winning (Anastasopoulos 2006; Barber et al. 2016). Selection into candidacy is thus a critical determinant of the gender gap in political representation (Lawless and Fox 2008).

The share of women in top political offices can be explained by either a lower rate of female entry into politics or a lower rate of female career progression within the political system (Folke and Rickne 2016).[3] In this paper, we establish the existence of substantial gender differences in the likelihood of competing for higher political offices among state legislators, and investigate the role of several mechanisms that could generate gender inequality in these outcomes. Focusing on gender differences in the career progression of state legislators provides an ideal setting because state legislatures have historically functioned as an important stepping stone for more senior political positions.[4]

[1]See Figure 1 for trends in female representation in the U.S. since 1971. In 2018, women comprised 21 percent of the U.S. senate and 19 percent of the U.S. House of Representatives (CAWP 2017). This is not only an American phenomenon: women comprised 32 percent of the U.K. House of Commons in 2018, and 12 percent of the Indian Parliament (Bhalotra et al. 2018).

[2]Numerous studies have shown that female and male politicians have different policy preferences, and that increasing the share of female politicians can improve the outcomes of women and children, while also increasing trust in government more generally (Chattopadhyay and Duflo 2004; Miller 2008; Iyer et al. 2012; Kalsi 2017; Clots-Figueras 2012; Bhalotra and Clots-Figueras 2014; Brollo and Troiano 2016). In the U.S., Ferreira and Gyourko (2014) found no evidence that female mayors make different policy choices compared to male mayors.

[3]The relative scarcity of women in leadership positions, including politics, is partly related to their lower probability of promotion compared to men with similar productivity and initial career profiles (Lazear and Rosen 1990; Pekkarinen and Vartiainen 2006; Smith et al. 2013; Antecol et al. 2018; Hospido et al. 2019). Many reasons have been proposed to explain this phenomenon, such as a higher probability of quitting (Lazear and Rosen 1990), career interruptions due to having children (Antecol et al. 2018), and higher thresholds for promotion (Pekkarinen and Vartiainen 2006).

[4]Over half of the 115th U.S. Congress began their political careers in the state legislature (NCSL 2018). Between 1976 and 2016, an average of 46.5 percent of members of the U.S. House of Representatives' and just under 50 percent of governors served in a state legislature. It is perhaps unsurprising that service in a state legislature is a common precursor to a Congressional or a gubernatorial career, as it can provide candidates with campaigning and legislative

To quantify gender differences in the effect of state legislative service on climbing the political ladder, we estimate the effect of winning a state legislature election on the probability of competing in, and winning, a higher-level election. To do this, we link the near-universe of candidates for U.S. state legislatures since 1968 to subsequent primary and general Congressional and gubernatorial election returns. We use a regression discontinuity design (RDD) based on close-won state legislature elections between men and women that effectively compares the eventual higher-level candidacy and representation of women who closely won a state legislature election over a man to women who closely lost a similar election. We then estimate this quantity for men, in which we compare the career paths of men who closely won over a woman to men who closely lost to a female candidate. By construction, our strategy ensures that winners and losers are otherwise comparable *within* gender, and that male and female candidates in our sample are drawn from state legislative and congressional districts with highly comparable constituency characteristics (Duerst-Lahti 1998; Fulton et al. 2006; Maestas et al. 2006; Sanbonmatsu 2006; Palmer and Simon 2008; Carroll and Sanbonmatsu 2013; Mariani 2008).

Winning a state legislature seat has a large positive effect on the probability that male politicians run for a higher level office compared to male candidates who narrowly lost a state legislature race. In contrast, serving as a state legislator has a smaller, statistically insignificant effect on the likelihood of female politicians to pursue a more senior political career. These results are robust to controlling for previous legislative experience, party affiliation, election type, term length, and the number of the candidates in the race. We also find that, unconditional on candidacy, men that win a state legislature seat experience a large increase in their likelihood of winning higher-level races, but no such effects are found for women.[5]

While our empirical strategy identifies an unbiased estimate of the effect of winning a state legislature seat on political career outcomes for women and men, interpreting the gender gap in this

experience while also allowing voters and parties to update their beliefs about a candidate's policy preferences and overall ability.

[5]Research has shown descriptive evidence of gender differences in "progressive ambition" of sitting politicians and other potential candidates (Fox and Lawless 2004; Carey et al. 2008). For instance, in a 2002 survey conducted among state legislators, female representatives reported more interest in continuing to serve in their current capacity and less interest in running for higher offices (Carey et al. 2008). Moreover, Fox and Lawless (2004) provide evidence that among a pool of potential candidates, women express lower levels of political ambition compared to men with similar professional credentials. See also Schlesinger (1966); Black (1972); Duerst-Lahti (1998); Fulton et al. (2006); Maestas et al. (2005; 2006); Sanbonmatsu (2006); Palmer and Simon (2008); Crowder-Meyer (2013), and Carroll and Sanbonmatsu (2013).

effect requires care (Anzia and Berry 2011; Fulton 2012). Narrowly elected female and male state legislators may have systematically different observed or unobserved characteristics, which represent either bias-inducing unobserved heterogeneity or mechanisms through which gender influences the empirical relationship we have uncovered. In fact, when comparing marginal winners or losers across gender, we find that narrowly elected female legislators have fewer prior terms of service in the state legislature, are less likely to be a sitting incumbent, are more likely to be a first-time candidate, and are more likely to be a Democrat than a Republican. However, despite these differences, when we model the heterogeneity of the effect across these dimensions, they have little impact on the estimated gender gap described above.

The gender gap in career progression is also not explained by several factors highlighted in previous studies. We find little evidence that our results are the product of differential attrition among narrowly losing candidates (Wasserman 2018). Moreover, our focus on mixed-gender races ensures that our cross-gender comparisons are made among candidates who compete in similar districts and electoral environments. In fact, including a host of interaction terms with election and district characteristics does not tangibly attenuate the estimated gender gap (Lawless and Pearson 2008).[6] The gender gap is also not specific to either the Democratic or Republican party. As a result, we can rule out explanations that hinge on party differences in the type of candidates that can win the party's support, or the differential role played by party elites in recruiting and screening female candidates (Niven 1998; Caul 1999; Sanbonmatsu 2002; Box-Steffensmeier et al. 2004; Sanbonmatsu 2006; 2010; Elder 2012; Thomsen 2015).

The gender difference in the effect of state legislative service on career progression is also not due to differences in the timing at which female and male politicians decide to pursue Congressional office. In fact, the disparity begins with the first opportunity that state legislators can compete in a Congressional election, widens over the next few opportunities, and never closes. Alternatively, female state legislators have a higher probability of re-running for the same seat in the subsequent state election compared to male politicians, generating higher female incumbency rates in state legislatures.[7]

[6]There are also no significant gender differences in the composition of Congressional races that prospective candidates would face, suggesting that differential opportunity structures in higher-level races are unlikely to be the primary factor behind our results (Mariani 2008; Darcy and Choike 1986; Carroll 1994; Darcy et al. 1994).

[7]A similar incumbency effect has also been documented among female state legislators in India (Bhalotra et

Female politicians may face higher costs borne of career-family tradeoffs due to prevailing gender norms, especially since many senior political positions are not considered family-friendly jobs (Bertrand et al. 2010; Goldin 2014; Goldin and Katz 2016; Kleven et al. 2019; Kuziemko et al. 2018). In order to explore if preferences regarding career-family tradeoffs are an important part of the gender difference in pursuing a Congressional career, we show our effect is driven by the 20 percent of state legislators who serve in full-time legislatures and by politicians in states located close to Washington, DC. These findings suggest that gender differences in the value of non-work time available for home production are unlikely to be the prominent mechanism behind our results, as the additional cost of moving from the state legislature to the national legislature along these dimensions is higher for women in part-time (versus full-time) positions, and for women located further away from DC (Bertrand et al. 2010; Goldin 2014; Goldin and Katz 2016; Mas and Pallais 2017).[8]

Finally, gender differences in the probability of moving up the political career ladder may arise because discriminatory practices by voters or party elites perpetuate a "glass ceiling" for women (Folke and Rickne 2016; Fouirnaies et al. 2018; Gagliarducci and Paserman 2011; Bauer 2020). The existence, or perception, of a "glass ceiling" may, in turn, lead female state legislators to underestimate their own ability and electability compared to male legislators, or shape their preferences about serving in more senior positions (Seltzer et al. 1997; Fox and Lawless 2011; Folke and Rickne 2016; Bordalo et al. 2019; Bauer 2020).[9] Although we cannot definitively conclude that the gender gap is the result of discriminatory barriers that prevent female legislators from climbing the political ladder, we provide additional evidence to support this mechanism. Specifically, we show that the gender gap is driven by female politicians serving in legislatures with a higher share of male representatives, suggesting that working in male-dominated environments may deter

al. 2018). Brown, Mansour and O'Connell (forthcoming) show that electing more female state legislators in India subsequently increases the number of female candidates for the national parliament, but their effect is driven by the entry of new politicians and not by incumbents.

[8]There is also evidence that divorce rates are higher in households where the husband earns less than the wife, and that being elected to become a parliamentarian or mayor in Sweden increases the divorce rates for women but not for men (Bertrand et al. 2015; Folke and Rickne 2020). In addition, Fisman et al. (2006) show in speed dating experiments that men prefer not to be matched with women who they perceive to be more ambitious than themselves, and Bursztyn et al. (2017) found that single female MBA students self-report lower level of ambition when they know the information will be shared with other students. Such a non-monetary cost (if anticipated) can deter some female politicians from climbing the political ladder.

[9]In recent work, Bordalo et al. (2019) experimentally show that both men and women overestimate their own and other's ability. However, men overestimate their own ability in traditionally male-dominated tasks, and vice versa for women.

women from pursing a political career in Congress. The link between characteristics of in-office experience to later career progression is consistent with recent findings suggesting the gender gap in progression to higher office is at least partly shaped by individuals' specific experience serving in political institutions (Gagliarducci and Paserman 2011; Fouirnaies et al. 2018).

The paper makes two main contributions. First, we add to the literature on gender inequality in the labor market, particularly to studies focusing on the lower rate at which women are seen in leadership positions (Lazear and Rosen 1990; Pekkarinen and Vartiainen 2006), and studies highlighting the role of occupational choices and discrimination in explaining gender gaps (Altonji and Blank 1999; Bertrand et al. 2010; Olivetti and Petrongolo 2016; Blau and Kahn 2017; Kleven et al. 2019; Angelov et al. 2016). Investigating gender differences in career promotions or occupational choices in the labor market is inherently difficult because job assignments are endogenously determined by firms, and labor supply decisions are endogenous to workers' unobserved characteristics. In contrast, we observe female and male politicians for whom assignment to the same position in the career hierarchy was arguably quasi-randomly assigned, and estimate its effect on their pursuit and attainment of higher-status positions in the career ladder.

Second, we contribute to a growing literature on the impact of policies aimed at increasing the representation of women in high-status positions. Existing studies have found mixed evidence that increasing the share of women in leadership positions (via quotas or other methods) affects the careers of female professionals (Bagues and Esteve-Volart 2010; Kunze and Miller 2017; Bertrand et al. 2018; Brown et al. forthcoming; Langan 2019; O'Connell 2020).[10] In politics, Broockman (2009) finds no evidence that narrowly electing a woman for a state legislature seat in the U.S. mobilizes women to vote or inspires other female candidates from nearby districts to run for office, while Gilardi (2015) provides evidence that electing female mayors in Switzerland increases the number of female candidates in neighboring municipalities, with the effect fading as more women are elected.[11] While the literature has largely focused on spillover-type effects on other politicians,

[10] For instance, Kunze and Miller (2017) found that having more female bosses decreases gender gaps in promotions. In contrast, Bertrand et al. (2018) found no evidence that mandating a higher share of women in boards of Norwegian companies benefited women working in these companies, while Langan (2019) shows that appointing female department chairs in academia reduces gender gaps in publications and increases the tenure probability for female assistant professors.

[11] Ladam, Harden and Windett (2018) show that narrowly electing female governors is associated with an increase in the number of female candidates running for the state legislature, and Baskaran and Hessami (2018) find that electing a female mayor in Germany led to an increase in the vote share received by female council candidates.

this study focuses on estimating and explaining the sources behind the gender gap in the career progression of individual politicians.

We conclude that gender differences in climbing the political ladder among local politicians implies that the pipeline for advancement to leadership positions does not function equally for men and women. This finding has important policy implications because it suggests that encouraging more women to enter politics, by itself, may not be sufficient to significantly increase the share of women at the top of the political hierarchy.

The remainder of the paper is organized as follows. Section II describes the data sources, provides background on U.S. state and national legislature elections, motivates our empirical approach, and describes the sample used in the analysis. Section III details the empirical strategy. We present results on moving from state to national politics in Section IV. Section V examines the sources of the gender gap and discusses potential mechanisms, and Section VI concludes.

II. Context and Data Sources

A. Data Sources

Our data start with the near-universe of candidates for U.S. state legislatures since 1967. The primary data source for state legislature elections comes from the State Legislative Election Returns (SLER) data set, hosted by the Inter-University Consortium for Political and Social Research (ICPSR 34297) and constructed by Klarner et al. (2013). The SLER provides candidate-level election returns for all state legislative elections from 1967 and contain information on the name of the candidate, the state, district, and chamber they are running in, as well as total vote counts and the candidate's party. Other election-level data includes information on the term length, type of election (e.g., general, special), and the number of candidates who contested the seat.[12]

We merge information from state legislature candidates to records from the U.S. House of Representatives, the Senate, and gubernatorial primary and general election returns from 1968-2016. We match candidates across levels within state using a fuzzy matching algorithm based on first and last name fields that is similar in practice to Anagol and Fujiwara (2016) and Brown et

[12] Appendix B provides additional detail on the data sources and the procedure to clean and code variables.

al. (forthcoming).[13] Although we are only able to track primary participation for Democrat and Republican candidates (or third-party candidates who participate in these elections), we observe candidates of all parties in general elections.[14]

To determine a candidate's gender, we compare candidates' first names to historical records from the U.S. Census Bureau and the Social Security Administration (SSA).[15] We code a candidate as male or female if both the Census and SSA records agree on the candidate's gender, hand-coding the remainder of candidates (about five percent) whose names are not unambiguously indicative of their gender. We drop a small number of elections (3.6 percent of total) where we do not know the gender of either of the top two candidates.

B. Context

Historically, women have comprised a minority of governors, as well as U.S. state and Congressional legislators. Figure 1 plots the female share of state and national legislators since 1970. While women have recently made gains in representation, they still lag far behind men: as of 2016, women comprise about 25 percent of state legislators and 19 percent of the Congress. While the share of female representatives in state legislatures started to grow in the early 1970s, the share of women in Congress did not start to increase substantially until the early 1990s. Notably, the difference in the share of women in state legislatures and in Congress is significantly larger now than in the early 1970s. Given the importance of state legislature service as a pathway to higher-level office, the objective of this paper is to understand the effect of state legislature service on career progression and its role in generating gender disparities in Congressional or gubernatorial representation.

There are more than 7,000 state legislative seats in the United States, with each position having a two- or four-year term length. Congress is comprised of 435 seats in the (lower) House of Representatives and 100 seats in the (upper) Senate.[16] Prior service in state legislatures has become

[13] To help prevent spurious matches, we only search for Congressional and gubernatorial candidates in the same state in which they appear in the state legislature elections data. Because male candidates may be more prone to move across states, our estimates of the gender gap might thus represent a lower bound.

[14] In practice, however, there are relatively few third-party candidates, and candidates who pursue Congressional office tend to not switch parties across levels of government.

[15] We first cross-reference all first names with lists of common first names. We classify candidates as male or female if their name only appears in one of the lists, that is, their name is unambiguously male or female, and then compare the remaining names to Census and SSA records.

[16] Within state, there are an average of about 20 legislative seats per Congressional seat. With the exception of

increasingly common among Congressional representatives, increasing from about 40 percent in the mid-1970s to just under 50 percent as of 2019.[17]

C. Motivating the Empirical Strategy and Analysis Sample

A state legislator's decision to compete for a higher-level political office is endogenous to their own observed or unobserved characteristics, the characteristics of the Congressional district or state, as well as characteristics of the current and future local and national elections. To mitigate these potential confounds, we quantify the causal effect of lower-level political service on higher-level candidacy by implementing a regression discontinuity design (RDD) which estimates the impact of winning a state legislature election on the likelihood of competing for, or winning, a Congressional or gubernatorial office. The advantage of the RDD is that it effectively generates quasi-random assignment of legislative service across otherwise-similar female or male candidates who run for state legislative office in comparable locales. However, the identifying assumptions underlying the estimation strategy apply specifically when comparing the effect of winning a state legislature seat *within*, but not necessarily across, gender (Anzia and Berry 2011; Fulton 2012). This is because narrowly elected female and male state legislators may be systematically different in their personal attributes and, importantly, they may compete in different types of races and districts.

With this limitation in mind, we compare election, district, and candidate characteristics between female and male winners in Table 1. Specifically, we regress each outcome on a female indicator, linear measures of margin of victory, controls for type of election, and constituency and year fixed effects.[18] Since 85 percent of female candidates compete in mixed-gender elections, while the vast majority of male candidates compete in same-gender elections, it is likely that male and female winners are more comparable in mixed-gender elections. Thus, we conduct the comparison in Table 1 separately for the sample of same-gender elections (Column 2) and mixed-gender elections (Column 3) – the latter defined as those elections in which the top two vote-earning candidates were a man and a woman.

Nebraska, each state has a bicameral legislature comprising of a House and a Senate.

[17] In the 115th Congress (serving from 2017 to 2019), approximately half of all members served in a state legislature at some point prior to being elected to their current office.

[18] The margin of victory is redefined to be positive for female candidates and negative for male candidates. In line with our primary analysis below, we also weight each regression using a triangular kernel and select each sample using an optimal bandwidth procedure from (Calonico et al. 2019; 2020).

In order to not overrepresent candidates who compete in multiple state legislature elections, only each candidate's first such election is included in the sample.[19] Conditional on ever running for a higher-level office, the average state legislator spends about seven years in the state legislature before running for higher-level office. We thus limit our sample to state legislature elections for years up to and including 2008 (and observe outcomes through 2016), as the inclusion of more recent state legislature elections will increase the frequency and intensity of measurement error (due to right-censoring) in the outcome variable.

While Panel A shows no difference in election characteristics between female and male winners, Panel B of Column 2 shows that female and male winners in same-gender elections compete in districts that differ along many key dimensions. For instance, women in same-gender elections compete in districts with historically lower margins of victory, a higher number of candidates, and where mixed-gender elections were more likely to occur. In contrast, comparing female and male winners in mixed-gender elections ensures that the candidates in our sample compete in similar districts. We therefore limit our analysis to the sample of mixed-gender elections to isolate the effect of a quasi-experimentally-assigned state legislature election victory in constituencies that could have plausibly elected either a man or a woman in order to avoid confounding area-specific characteristics.

The focus on mixed-gender elections does not eliminate differences in the personal attributes of female and male winners, which are shown in Panel C: even among marginal winners, women have less experience, are more likely to be first-time candidates, and are more likely to belong to the Democratic party. While theoretically it is unclear if these differences in individual characteristics represent potentially bias-inducing heterogeneity in our analysis or some of the possible mechanisms through which gender is operating, we ultimately show in Section V that they do not themselves explain the estimated gender gaps in political career progression.

D. Descriptive Statistics

Table 2 reports sample means for a set of election characteristics (Panel A), historical state legislative district characteristics (Panel B), and higher-level election outcomes for state legislative

[19] The number of times a candidate runs for a state legislative seat before their first mixed-gender race may be endogenous. In robustness checks below, we show that our estimates are qualitatively similar when we focus on mixed-gender elections where both candidates are competing in a state legislative election for the first time.

candidates (Panel C).[20] The sample means for our estimation sample of first-time mixed-gender elections within an optimal bandwidth are reported in Column 1 of Panels A and B and Columns 1-2 of Panel C. Given our sample restrictions, a natural concern is that mixed-gender elections are inherently different from the average state legislature election. Column 1 of Panels A and B show that our analysis sample is broadly similar to all contested state legislature elections (Column 2) with respect to both characteristics of the focal state legislature election and historical legislative district characteristics. In both samples, there are 2.16 candidates per election, and the average term length is approximately 2.3 years. Historical rates of female participation and the competitiveness of elections at the state legislative district level are also comparable: in the analysis sample, mixed-gender elections comprised 19.7 percent of all prior elections, which is somewhat higher, but comparable to 17.0 percent for the full sample. The incumbent ran for re-election in 55 percent and 54 percent of prior elections in the analysis and full samples, respectively.

Moreover, candidates from first-time mixed-gender elections (Columns 1 and 2 of Panel C) exhibit similar rates of future political candidacy when compared to candidates in other contested legislative elections (Columns 3 and 4 of Panel C).[21] For instance, between 4.3 and 4.7 percent of male candidates in either sample ever run in any Congressional election, and 3.0 percent of female candidates run from mixed-gender elections, compared to 3.7 percent of female candidates from all elections. In Appendix Figure A1, we also show that the analysis sample is drawn from a roughly proportionate sample by state.

Using the full sample of first-time mixed-gender elections, Figure 2 plots the mean rate at which male and female state legislature candidates are ever observed contesting for higher office in four-year bins. The differential between male and female candidates in their propensity to ever contest for higher office is on the order of two to four percentages points through the 1970s and 1980s. This difference then stabilizes to around two percentage points in the early 1990s and persists through 2008.[22]

[20] Our first-time mixed-gender elections sample contains 25,233 candidates from 16,161 elections from which we draw our estimation sample of narrowly won elections.

[21] The means in columns 3 and 4 are calculated using the top-two candidates from all contested legislative elections.

[22] This pattern could be a result of higher rates of electoral success by men, although conditional on candidacy, there is no male advantage in terms of vote share won or the probability of winning (Anastasopoulos 2006; Barber et al. 2016).

III. Estimating the Career Effects of State Legislative Service

A. Empirical Model

We estimate the relationship between winning a state legislature seat and the probability of future higher-level political candidacy separately by gender via the following OLS regression:

$$Ever\ ran\ HLE_{ict} = \alpha Won\ election_{ict} + \beta f(x_{ict}) + \gamma[Won\ election_{ict} \times f(x_{ict})] + X_{ict}\delta + \pi_c + \phi_t + \epsilon_{ict} \quad (1)$$

Where $Ever\ ran\ HLE_{ict}$ is an indicator variable equal to 1 if state legislature candidate i in election at time t in constituency c is ever observed contesting for a primary or general election for a Congressional or gubernatorial position, and zero otherwise. The variable of interest, $Won\ election_{ict}$, is an indicator variable equal to 1 if candidate i won their state legislature election in constituency c in year t. We also include a linear measure of the candidate's victory margin, $f(x_{ict})$, and allow the effect of the victory margin to vary for winners and losers. X_{ict} represents a vector of individual controls including the candidate's cumulative years of state legislative experience, their party affiliation, length of term for the contested seat, and number of candidates in the election, as well as for the type of election (general or special). To control for time- and constituency- invariant unobservables and to improve precision, we include state legislature constituency fixed effects, π_c, and state legislature election year fixed effects ϕ_t. ϵ_{ict} is the error term, and we cluster standard errors by state. Our coefficient of interest is α, which captures the effect of winning an additional term in the state legislature on future career outcomes in politics.

We first estimate equation (1) with a simple local linear specification consisting only of narrowly won first-time mixed-gender elections based on an optimal bandwidth selector (Calonico et al. 2019; 2020). We also estimate equation (1) by replacing the dependent variable with any of four indicator variables that take a value of one if the state legislator ever runs in any Congressional race, any gubernatorial race, any House primary, or any House general election, respectively, and zero otherwise, as well as the unconditional probability of ever winning any of these races.

B. Investigating the Validity of the Research Design

Our empirical approach compares just-winning women (men) to just-losing women (men) in order to estimate the impact of winning a state legislature seat on future political candidacy for higher-level offices. The assumption underlying this approach is that women who narrowly win over a male competitor are comparable, on average, to women who narrowly lose to a male competitor (and similarly for men winning over/losing to female candidates).

We first test for manipulation of the running variable following McCrary (2008) by plotting the distributional density of a candidate's margin of victory in first-time mixed-gender state legislature elections for both male and female candidates. In Figure 3, we plot these distributions for female candidates in Panel A and male candidates in Panel B. Both analyses provide no evidence of a discontinuity around the zero vote margin of victory.

We next test whether individual, election, or district characteristics exhibit any differential discontinuous jump at the identifying threshold. Columns 2 and 3 of Table 3 show the difference in the focal characteristic (indicated in rows) for the election winner relative to the election loser for the sample of female and male candidates, respectively. Overall, only 2 out of 24 estimates are statistically significant.[23] These results indicate that winning a state legislature seat in a mixed-gender race is not associated with the candidate being a Democrat or Republican, or with the number of previous terms served (Panel C). We also find little evidence across winners and losers related to election or historical characteristics of the districts in which these elections occur, such as the term length of the contested seat, average margin of victory, the historical number of candidates, and the share of previous elections contested by incumbents (Panels A and B).

IV. Results

A. Effects of State Legislature Service on Congressional Candidacy

We start by presenting a graphical analysis of the relationship between state legislative service and career progression using the sample of close first-time mixed-gender elections. Panels A and B of Figure 4 plot residualized binned means of the probability of female and male state legis-

[23] Specifically, men who win a state legislature seat are less likely to be a sitting incumbent and are more likely to be a first-time candidate.

lature candidates ever running in any higher-level race (primary or general), after accounting for constituency and year fixed effects. Over these binned means, we also plot linear regressions and associated confidence intervals, estimated separately for winners and losers. It is clear from the figure that winning a state legislature seat significantly increases the probability that male legislators run for a higher-level seat, while the effect on female state legislators is small and statistically insignificant.[24]

Table 4 contains coefficients from the estimation of equation (1). When a man wins a state legislature election (Column 1, Panel B) they are 7.1 percentage points more likely to ever run in a higher-level election than if they had lost, an effect which is statistically significant at the 1 percent level. In comparison, winning a state legislative seat for women (Panel A) increases the likelihood of ever running in a higher-level election by only 2.4 percentage points but the coefficient is not significant at conventional levels. Successively adding controls for cumulative years of legislative experience, party affiliation, election type, term length, or number of candidates in the race (Columns 2-6) has little impact on the estimates. Appendix Figure A2 provides evidence that the results are robust to varying the bandwidth choice. In addition, the choice of polynomial order also has virtually no effect on the estimates.

The difference of 4.7 percentage points across men and women in the effect of winning a state legislature election on the likelihood of ever running in a Congressional race is significant at the 5 percent level.[25] This result implies that, relative to the means of candidates who lost a state legislature race, the increase in the probability that a man ever runs in a higher level election if they win a state legislature seat is twice as large as the increase in the equivalent probability for female state legislature winners.[26] These gender differences are almost surely not caused by biologically predetermined mechanisms related to a candidate's gender identity, but rather by how it interacts with societal norms. Thus they should be interpreted with caution, as the marginal female winner

[24] Wasserman (2018) found that novice female candidates who lose local-level races in California (city, county, and school district offices) are significantly less likely to compete in any subsequent election compared to men who lose. Figure 4 provides no evidence that the effect of winning a state legislature seat on future higher-level candidacy is driven by losing candidates, consistent with the findings of Bernhard and de Benedictis-Kessner (2021).

[25] Alternatively, estimating equation (1) on the sample of all mixed-gender elections indicate that female (male) winners are 4.1 (6.7) percentage points more likely to run for a higher-level seat than if they had lost. The gender differential is smaller in this sample, but remains significant at the ten percent level.

[26] Specifically, winning a state legislature seat increases the probability of running for higher-level office by 368 percent (0.070/0.019) for men and 164 percent (0.023/0.014) for women, which implies that male state legislators are about twice as likely (368/164=2.24) to ever run for a higher-level seat.

is likely different, on observed and unobserved characteristics that could be either correlated or caused by gender identity, compared to the marginal male winner (Anzia and Berry 2011).

In Table 5, we disaggregate the dependent variable into separate measures for ever running in any Congressional race, any gubernatorial race, House primary elections, and general elections for the House. The results indicate that men's increased likelihood of running for higher office is observed in any Congressional elections and driven by primary and general elections for the House of Representatives.[27] We do not find a gender difference in the likelihood of running for governor or the Senate.[28] The effect for female state legislators, however, remains small and statistically insignificant across the different election types.[29]

B. Effects of State Legislature Service on Winning a Higher-Level Election

Given men's higher propensity to contest higher-level elections in response to an additional term in the state legislature, we next estimate the effect of winning a state legislature seat on the unconditional probability of winning a higher level election. Panels A and B of Figure 5 plot residualized binned means of the probability of female and male state legislature candidates ever winning in any higher-level race (primary or general), after accounting for constituency and year fixed effects. We next estimate versions of equation (1) that replace the outcome variable with either an indicator for ever winning any higher-level election in any type of race (primary or general), an indicator for winning in any gubernatorial election, an indicator for winning a primary election for the House of Representatives, and an indicator for winning a general election for the House of Representatives. The corresponding estimates in Column 1 of Table 6 show that while winning a state legislature seat increases the probability of winning a higher-level election by 4.9 percentage points for men, the effect for women is small and statistically insignificant. This is largely due to men winning in House primary and House general elections (columns 4 and 5). These effects are large relative to the mean rate at which losing state legislature candidates ever win a higher-

[27] The estimated differences in candidacy among female and male state legislators explain between 10 and 25 percent of the 2016 gender gap in Congressional candidacy. See Appendix B for the details of this calculation.

[28] Appendix Table A1 reports additional estimates for primary and general gubernatorial and Senate elections.

[29] In Appendix Table A2, we show that the results are robust to expanding the analysis sample by including all mixed-gender elections (Column 1). Column 2 adds same-gender elections from constituencies that ever saw a mixed-gender election into the sample. Specifically, we include first-time same-gender elections that occurred within a four-year bandwidth of the focal election from the estimation sample. The results still reveal a gender difference of 1.3 percentage points, though this difference is not statistically significant.

level election: for men, an additional state legislature term increases the likelihood of ever winning a higher-level election by four times the average rate at which this occurs for losing candidates (0.049/0.012).

V. Explaining the Gender Gap

A. Differences in Observables

Panel C of Table 1 showed that marginal female and male winners in mixed-gender elections have different personal characteristics. Table 7 provides a test for whether the observed differences between marginal female and male candidates explain the gender gap in running for a Congressional seat.[30] To start, Column 1 of Table 7 reproduces the gender gap estimated in Column 2 of Table 5 using a pooled sample of male and female candidates. This estimate shows that marginally elected female state legislators are 4.3 percentage points less likely to run for Congress than similarly elected male state legislators. In Column 2 we add an interaction between winning a state legislature seat and the number of terms served (experience) to the specification, which has little impact on the estimated gender gap. Similarly, adding interactions between winning a state legislature seat and an indicator for incumbency, being a first time candidate, being a Democrat, or being a Republican in Columns 3-6 has little impact on the estimated gender gap in running for Congress. Finally, adding all interaction terms simultaneously in Column 7 only lowers the gender gap slightly to 4.0 percentage points and the interaction terms of winning a state legislature seat with other candidate characteristics are not mutually statistically significant.[31]

The lack of effect heterogeneity by accumulated experience or incumbency indicate that the gender gap in pursing a Congressional career is driven by differential returns to service, rather than based on systematic differences in accumulated experience across male and female candidates. Moreover, the lack of heterogeneity by party affiliation suggests the gender gap in the return to state legislative service is not an artifact of party-specific effects. Thus, the estimated gender gap

[30] In what follows, we focus on participation in Congressional races (both primary and general) as the main outcome of interest, and exclude gubernatorial races.

[31] To further examine the role of previous experience and party affiliation, we limit the sample to those close mixed-gender elections in which both the male and female candidates were contesting for the first time. Results from this exercise are presented in Column 3 of Appendix Table A2. Despite the substantially smaller sample, these estimates suggest that the gender gap in career progression is even larger among novice state legislators, implying that preexisting experience is not the cause of the patterns of differences across men and women.

is unlikely to be related to explanations that hinge on party differences in the type of candidates that can win the party's support or the role that party elites play in the recruitment and screening of female and male candidates (Niven 1998; Caul 1999; Sanbonmatsu 2002; Box-Steffensmeier et al. 2004; Sanbonmatsu 2006; 2010; Elder 2012; Thomsen 2015).[32]

To rule out the possibility that the gender gap in the effect of winning a state legislature seat simply reflects differences in district characteristics, we report in Appendix Table A3 specifications where we include interaction terms between winning a state legislature seat and several district characteristics.[33] Including these interaction terms does not impact the estimated gender gap.

It is also possible that these gender differences in pursuing a Congressional career might simply be the result of dissimilarities in the types of national elections that our female and male state legislator winners have the opportunity to contest. In particular, if there are systematic differences across gender in the competitiveness of subsequent national elections, our results may erroneously be driven by those unobserved factors. For example, suppose that female state legislators were more likely than their male counterparts to face Congressional incumbents in the subsequent national elections in their state. Such a systematic difference might arise due to endogenous responses to more women winning lower-level seats, which could thus generate the estimated gender differentials above. To investigate this, we estimate the relationship between the gender of the elected state legislator and characteristics of the next Congressional election in the state in which that candidate could run. We report the results in Appendix Table A4. Columns 1-2 include primary elections for Democratic and Republican candidates while Columns 3-4 contain general elections, regardless of party affiliation. Overall, the results provide little evidence that, in our sample, men and women face a different degree of competition in subsequent Congressional elections. Specifically, the gender of the state legislator is not associated with the preponderance of incumbents contesting in the subsequent Congressional elections in their state, whether Congressional seats are held by the candidate's party, the share of non-freshman incumbents, the share of sitting incumbents female, nor the share of races where third-party candidates are running. We thus conclude that our estimates

[32] Anzia and Berry (2011) show that Congresswomen win more federal discretionary spending for their districts and cosponsor more legislation than male colleagues, providing evidence that female legislators are positively selected on capability and ambition. If women are positively selected on these dimensions at lower levels of the political heirarchy, it would bias estimates of the gender gap in political career progression toward zero.

[33] The baseline differential and sample size in this table differs slightly due to missing district characteristics in some years.

of the gender gap in the political return to winning a state legislature term are not a result of differential opportunity to contest for national office.[34]

B. Timing of Running for Congressional Seats

An important consideration is that our main finding of gender differences in the probability of running for a Congressional seat could mask differential timing at which state legislators decide (or are chosen by parties) to contest up. To explore this hypothesis, we estimate the probability of ever running for a higher-level seat at each potential opportunity that a state legislature candidate (or current state legislator) could possibly compete for a Congressional seat. Specifically, we code every two years as representing one opportunity to run for higher office, as the House of Representatives exhibits complete turnover every two years. We include in the set of opportunities those Congressional elections that occur before the term of office for which they ran is completed. Formally, the number of opportunities for candidate i in constituency c to run for a Congressional seat is defined as:

$$Opportunities_{ict} = \frac{1}{2}\left[Year\ of\ Congressional\ Election_{ict'} - Year\ of\ State\ Election_{ict}\right] \qquad (2)$$

We estimate equation (1) using an indicator equal to one if the state legislator runs for a Congressional seat in the first τ opportunities conditional on having had up to τ opportunities as the outcome variable.[35] Across values of τ, this analysis captures political career outcomes of candidates who continue to serve in their same seat, run for a different state legislature office, or

[34] We calculate Congressional outcomes at the state-level for two reasons. First, while some state legislatures may require their legislators to live in the district they represent, the Constitution makes no such restriction for Congressional House members. Second, computing outcomes at the Congressional district level requires several assumptions due to data constraints. Specifically, in order to execute this analysis at the district level we would need to: 1) assume district boundaries at both levels are held fixed over time, 2) assign the Congressional district with the largest population share of state district population in the intersection for state districts that lie in multiple Congressional districts, 3) exclude those districts in which there are naming differences across the data sets and in the crosswalk that, due to changing boundaries and district names over time, may preclude any match. With these caveats in mind, the results of using Congressional district outcomes are broadly similar to Appendix Table A4.

[35] For example, the first opportunity for a candidate who was elected to a state legislature in 2004 (with a term beginning in early 2005) to run for a Congressional seat would be in 2006, and the second opportunity would occur in 2008. In cases where state legislature elections are held in odd-numbered years (off-year elections, *e.g.* Virginia, New Jersey), we count the first opportunity as occurring in the year in which the state legislator takes office. For example, the first opportunity for a candidate who was elected to the state legislature in 2003 to run for a Congressional seat would be in 2004, the second opportunity occurs in 2006 and the third opportunity would occur in 2008. The first opportunity for legislators from such states to run for higher office thus occurs one year earlier relative to their election year. This implies that if a candidate runs for Congress during their second potential opportunity, the indicator variables takes a value of one $\forall \tau \geq 2$.

exit politics for a period of time and then re-enter politics to contest for a higher-level position. Because it is a cumulative measure, this variable eventually converges to the "ever run" outcome used in Tables 4 and 5. These estimates allow us to flexibly explore how quickly candidates run for Congressional seats after being elected to the state legislature.

Figure 6 plots the estimates of running for a Congressional seat by the number of cumulative opportunities in which the candidate can do so. Panels A and B plot the likelihood of ever running in any higher-level elections and the likelihood of ever running in any Congressional election, respectively. Although some of the individual estimates are imprecise, the overall picture presented in the plots provide strong evidence that, relative to the candidate's first close-won election, the gender gap in running for a higher office appears in the first opportunity to run, gradually increases over time, and never closes.

C. State Legislative Service and Persistence in the State Legislature

To further investigate the possible determinants of the gender gap in career progression, we examine the decisions that state legislature candidates are making with regard to running for subsequent state legislature elections. We estimate the relationship between winning a state legislature seat and the probability of recontesting for the same seat in subsequent elections relative to election losers of the same gender using the following OLS regression:

$$incumbent_{ict+k} = \alpha Won\ election_{ict} + \beta f(x_{ict}) + \gamma[Won\ election_{ict} \times f(x_{ict})] + X_{ict}\delta + \pi_c + \phi_t + \theta_{t+k} + \epsilon_{ict} \quad (3)$$

Where $incumbent_{ict+k}$ is an indicator variable equal to one if state legislature candidate i in the election at time t in state constituency c contests for the same seat in subsequent election cycle $t+k$, and zero otherwise. Other regressors are defined similarly to equation (1), with an additional vector of fixed effects for the year of the subsequent state legislature election θ_{t+k}. We estimate equation (3) using our sample of first-time mixed-gender elections. We apply the specification to two outcomes: whether the candidate ran for the exact same seat in the same chamber in the subsequent election, and whether the candidate ran for any state legislature election in the same state (inclusive of other chambers).

Estimating equation (3) allows us to quantify differences across just-winning versus just-losing

candidates in the likelihood of competing in subsequent state legislature elections. We begin with the sample of narrowly won elections in Column 1 of Table 8, and successively add controls for individual and election characteristics in Columns 2-5 using a simple local linear specification on a sample determined by an optimal bandwidth selection algorithm. The estimates in Panel A suggest that a female candidate closely winning a state legislature seat over a male competitor increases her probability of running for the same seat in subsequent elections by nearly 83 percentage points relative to a female candidate who narrowly lost to a male competitor. In contrast, the results in Panel B suggest that when a male candidate narrowly wins a state legislature seat, his likelihood of running for the same seat in subsequent elections is only about 69 percentage points higher than a narrowly-losing male candidate. The difference by gender of 13.6 percentage points is statistically significant at conventional levels, as shown by the p-value of the test for coefficient equality in a pooled and fully interacted model. Panels C and D of Table 8 provide similar results when we broaden the definition of the outcome to include any state legislature seat in the subsequent election. Overall, the results in Table 8 indicate that male state legislators have a lower likelihood of competing for the same seat in the following election cycle compared to female state legislators. In the context of a politician's decision to continue contesting or run for higher office, this finding is consistent with a similar pattern in India established by Bhalotra et al. (2018), who show that female state legislators have a higher incumbency rate compared to male legislators.

D. Gender Differences in Career-Family Tradeoffs

According to the National Conference of State Legislatures, the average state legislator was 56 years old in 2015. In this same sample, female legislators were about two years older than male legislators (Kurtz 2015).[36] Given these ages, it is reasonable to assume that most female politicians compete in state legislative races after completing their fertility. Although a first-child "penalty" is unlikely to explain gender differences in climbing the political ladder, it is possible that female state legislators face different career-family tradeoffs compared to male legislators when deciding whether to pursue a Congressional career.

We conduct two heterogeneity analyses aimed at providing some insight into the impact of

[36] We are able to collect age information for candidates in our mixed-gender sample from 1996-2008. Consistent with Kurtz (2015), we find that female candidates in this subsample are about two years older than their male counterparts, at 50 and 48 years old, respectively.

career-family tradeoffs on the relationship we have uncovered. First, we use cross-state variation in the time commitment expected of state legislators. In general, legislators are required to devote between 60 to 85 percent of an equivalent full-time job's hours to their legislative duties (legislative positions can be full-time, hybrid, or part-time, depending on the state).[37] Slightly more than half of state legislatures are comprised of hybrid positions, and the rest are almost equally split between full- and part-time. This heterogeneity allows us to provide suggestive evidence on the importance of differential barriers to entry and/or the potential for career-family tradeoffs as mechanisms generating our results. Intuitively, a move from a part-time state legislature seat to Congressional office will represent a larger change in these dimensions than a move from a full-time state legislature position to a similarly full-time Congressional seat. For example, if female politicians do not compete in Congressional elections because electoral success would lead to an increase in their time commitment to work, a part-time state legislator will presumably be more deterred by this potential shift than a full-time state legislator. If gender differences in these types of factors are important determinants of our results then we would expect our estimates to be larger in states with part-time, rather than full-time, positions.

Table 9 shows that the opposite is the case: the gender difference among part-time state legislatures (Panel A) are far smaller than those in full-time legislatures (Panel B), despite the fact that they comprise only about 20 percent of the sample. Specifically, the estimated gender differential in ever running for a Congressional seat in full-time legislatures is 15.5 percentage points; this is relative to the lower commitment states which have a smaller and statistically insignificant difference. The fact that the gender gap in moving to Congress is far smaller for part-time legislators compared to full-time legislators suggests gender differences in opportunity costs via career-family tradeoffs or preferences for part-time or flexible work are unlikely to be the main mechanisms behind our findings. As reported in the first column of Appendix Table A5, the gender difference in winning a Congressional election is also driven by full-time legislatures.

We conduct another heterogeneity analysis in which we estimate the results by whether the state legislature seat is above or below median geographical distance to the District of Columbia.[38] Intuitively, the cost of serving in Congress from the household's perspective (*e.g.* relocation, child-

[37] These classifications are based on surveys of state legislators from NCSL (2017).

[38] Distance is calculated from the state centroid to the District of Columbia centroid.

care) should be smaller for candidates in states that are close to Congress. Thus, if career-family tradeoffs are an important determinant in the decision to run for Congress, we would expect the gender difference to be greater for candidates living in states farther away from Washington DC. The results in Column 2 of Table 9, however, do not provide evidence consistent with this mechanism. The gender gap in Congressional candidacy is about 11 percentage points in states located closer to DC, while it is small and statistically insignificant in states located further away from DC. Although distance to DC could simply reflect differences in gender attitudes across locations, taken together, our results indicate that household constraints, at least as far as they are captured by the above metrics, are likely not the primary explanation for gender differences in the career progression of state legislators.

E. Is There a Glass Ceiling in Politics?

The results above indicate that heterogeneous responses to winning a state legislature seat by female and male candidates due to career-family tradeoffs or political persistence are unlikely to fully account for the estimated gender gap in political career progression. Although we cannot directly test whether female state legislators face discriminatory barriers preventing them from climbing the career ladder, the evidence we present is consistent with the presence of a "glass ceiling" in politics (Folke and Rickne 2016).

This "glass ceiling" may itself be the result of the gender-disparate working environments that women face or may give rise to them. While we cannot distinguish the direction of this relationship, the connection between a predominately male environment and the performance of female leaders has been well-documented in politics and other settings. In a study of mayors in Italy, Gagliarducci and Paserman (2011) find that female mayors are less likely to survive their tenure when working with an all-male council, in areas with less favorable attitudes towards women, and in locations where they were the first elected female mayor. Similarly, Sarsons (2019) finds that female economists are less likely to receive tenure the more they co-author while male economists face no such penalty. This suggests that women are less likely to be equally credited in group-work environments.

To examine the role of this mechanism, we estimate our main analysis splitting the sample

by an indicator for being above or below the median share of the male members in the state's legislature. We calculate the share of men in the state legislature as the fraction of male winners in a state-chamber-year cohort. The results in Column 3 of Table 9 indicate that the gender gap in state legislatures with below median share of male representatives (Panel A) is small and statistically insignificant. In contrast, the gender gap in state legislatures with above the median share of male representatives is large (about 10 percentage points), and is statistically significant at the 5 percent level. These results lend support to the hypothesis that working in male-dominated environment may negatively affect the career progression of female politicians, suggesting the gender gap in progression to higher office is at least partly shaped by individuals' specific experience within political institutions.

The results are also consistent with the possibility that voters and party elites evaluate the performance or ability of female state legislators differently than men. For instance, Fouirnaies et al. (2018) find that female state legislators are less likely to serve on committees most valued by donors, and are more likely to sponsor legislation related to women's issues compared to legislation on more general issues. Importantly, their results indicate that these patterns are not driven by self-selection of women into activities, but instead are driven by the type of opportunities offered to women by the legislature's leadership.

VI. Conclusion

Contemporary discourse frequently points to gender imbalances in high-status occupations, but the causes of these representation gaps are many, and often difficult to disentangle. In many countries, women are underrepresented in the upper echelon of the political sphere, and these disparities are both large and persistent. In the U.S., state legislatures serve as a primary channel supplying politicians to higher-level political offices. We test whether the most common career pipeline to higher-level offices functions for women as well as it does for men.

Using data that track the political careers of the universe of U.S. state legislature candidates since 1968, we estimate the effect of winning a state legislative election on individuals' political career progression. We use a quasi-experimental empirical design and quantify a substantial gender gap in the effect of winning an additional state legislature term on the likelihood of competing and

winning a Congressional seat. Winning an additional legislature term increases the rate at which men eventually contest up by two times the rate at which it does for women, and also increases the rate at which male state legislators ever win a Congressional election compared to female state legislators.

We show that this gender gap in career progression is not explained by candidates' observable characteristics, the congressional districts in which they run, or by the amount of prior legislative experience they have. Moreover, the fact that the gender gap in the effect of state legislative service is found among states with full-time legislatures who face a smaller additional opportunity cost of serving in Congress suggests this gap is not purely a function of differential career-family tradeoff decisions. Instead, the evidence supports the notion that female politicians either face or internalize a "glass ceiling," resulting in a substantially lower rate of progression up the political career ladder.

These findings indicate that increasing the representation of women at lower-level political offices is unlikely, by itself, to significantly reduce the gender gap in representation in higher-level political offices. Instead, reductions in the barriers to career progression that women face from within political or party institutions is a more likely path to achieving greater gender parity in top leadership positions.

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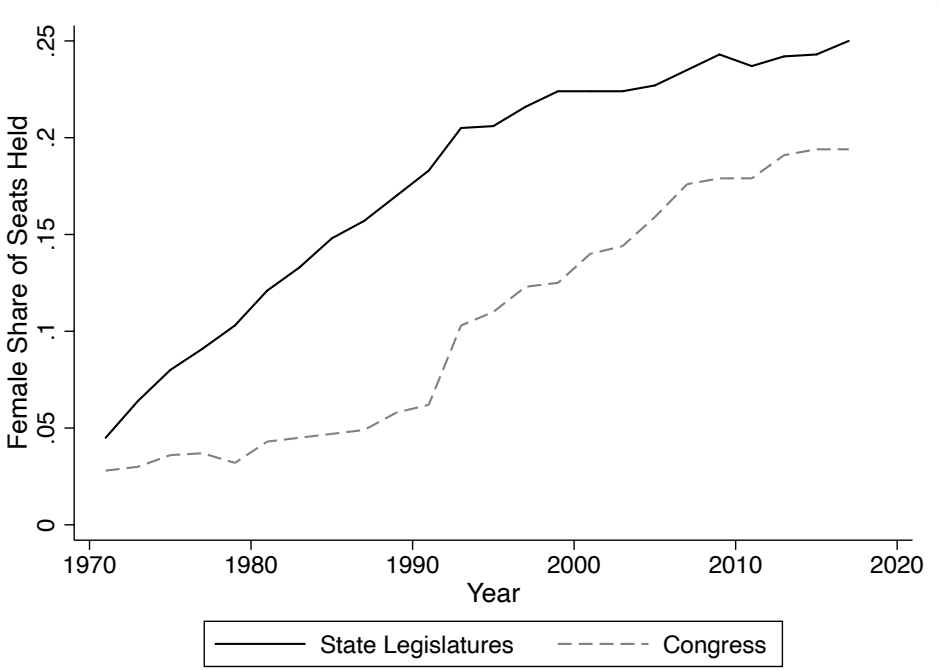
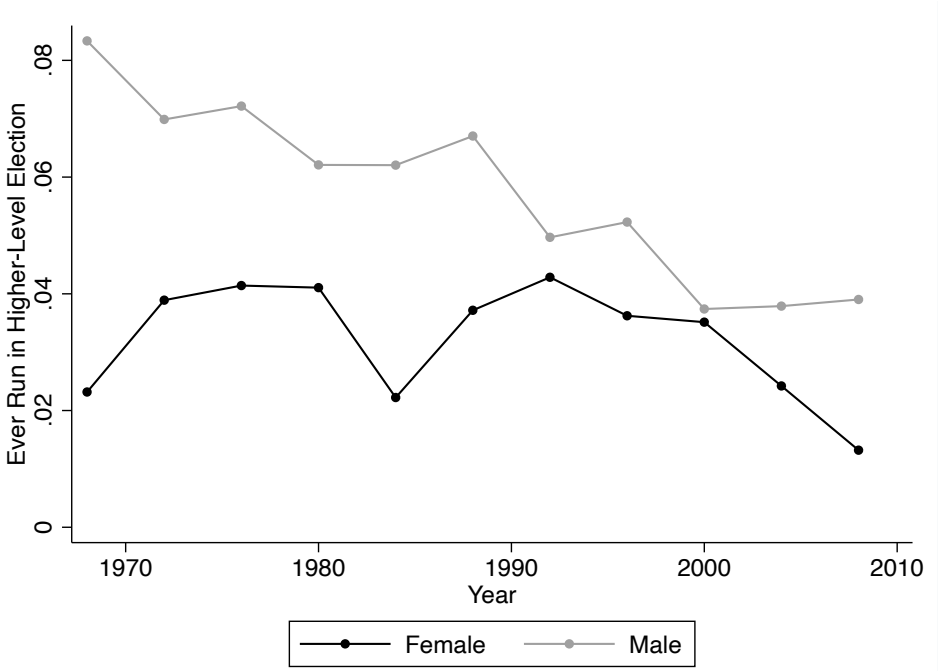
Figure 1: Female Representation in U.S. State Legislatures and Congress



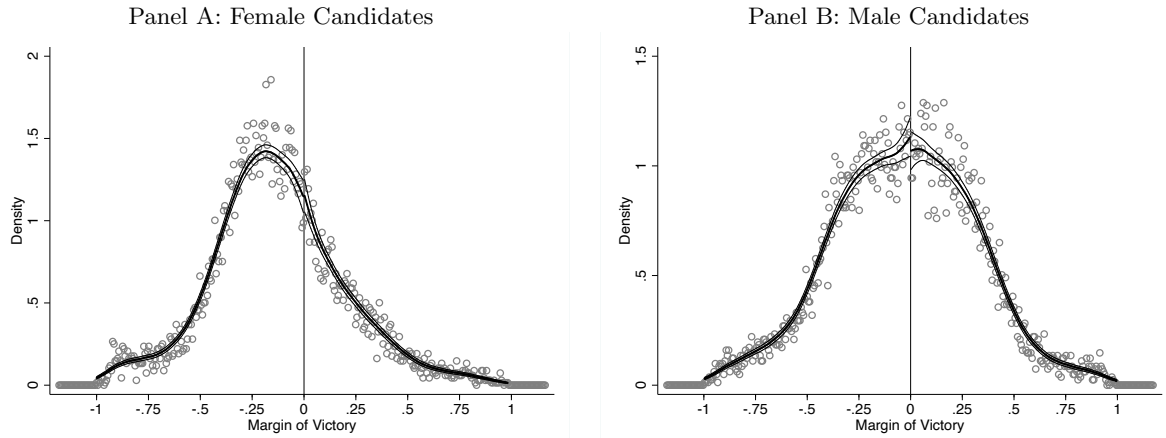
Note: This figure reports the share of seats held by female politicians over the period 1971-2017 in both Congress and the state legislatures. Data come from authors' calculations and the Center for American Women in Politics.

Figure 2: Share of State Legislative Candidates Who Ever Run for Higher-Level Office



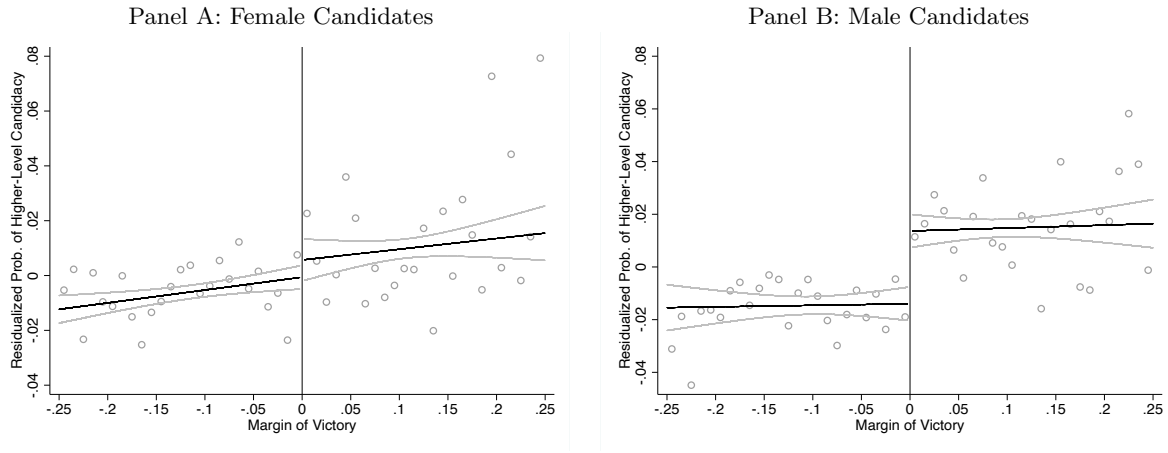
Note: This figure reports the share of state legislative candidates that ever run for higher-level office separately by gender in four-year bins of state legislative election year. The sample includes all candidates from first-time mixed-gender elections.

Figure 3: McCrary Test



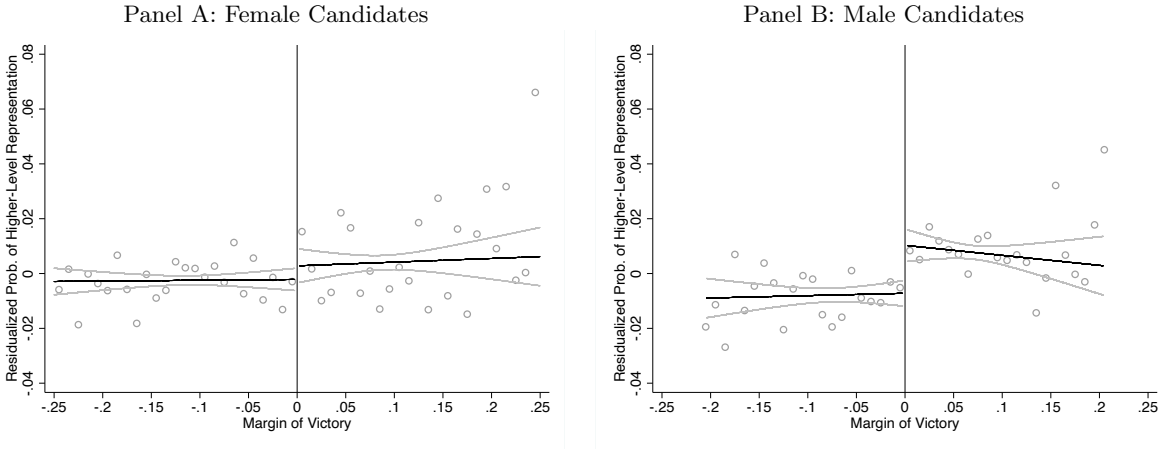
Note: These figures report results from a McCrary (2008) test for a discontinuity in the density of the margin of victory. Panel A plots the victory margin density for female candidates and Panel B plots the victory margin density for male candidates. The sample includes all first-time mixed gender elections. Thin black lines represent 95 percent confidence intervals.

Figure 4: Gender Gap in Higher-Level Candidacy



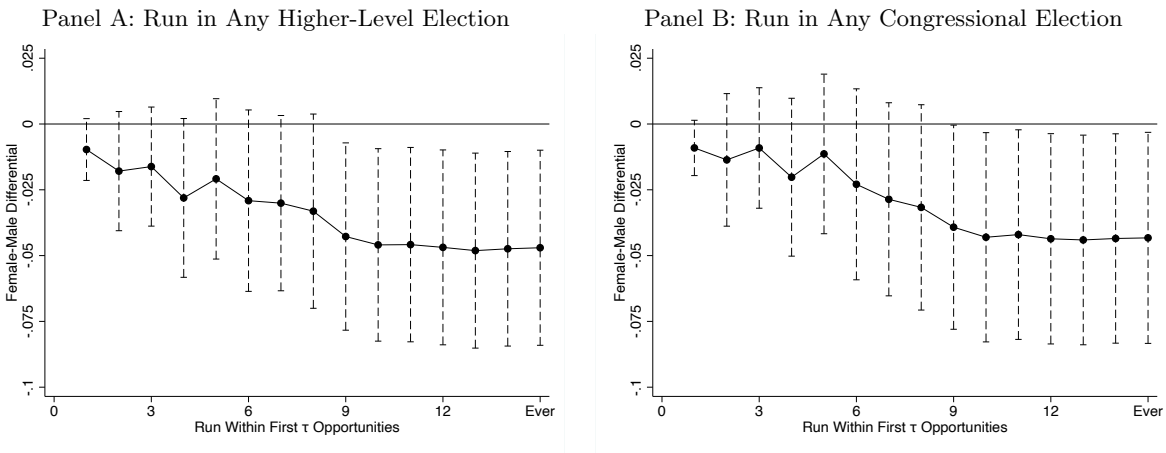
Note: These figures report regression discontinuity estimates of the effect of winning a state legislature election on future higher-level candidacy separately by gender. Panel A reports estimates for female candidates and Panel B reports estimates for male candidates. The sample contains first-time mixed-gender elections. Each point plots the mean residual within each bin, after accounting for constituency and year fixed effects. Solid lines represent linear regressions, estimated separately for winning and losing candidates, and are weighted using a triangular kernel. Gray lines represent 90 percent confidence intervals with standard errors clustered at the state level.

Figure 5: Gender Gap in Higher-Level Representation



Note: These figures report regression discontinuity estimates of the effect of winning a state legislature election on future higher-level representation, defined as winning any higher-level election, separately by gender. Panel A reports estimates for female candidates and Panel B reports estimates for male candidates. The sample contains first-time mixed-gender elections. Each point plots the mean residual within each bin, after accounting for constituency and year fixed effects. There are fewer points in Panel B because the optimal bandwidth is less than the length of the x-axis. Solid lines represent linear regressions, estimated separately for winning and losing candidates, and are weighted using a triangular kernel. Gray lines represent 90 percent confidence intervals with standard errors clustered at the state level.

Figure 6: Congressional Timing Results



Note: These figures report estimates of the gender gap in higher-level candidacy across varying time horizons. All regressions are weighted using a triangular kernel, include constituency and year fixed effects, the full set of candidate and election controls, separate winner and runner-up measures of the margin of victory, and use the optimal bandwidth from Calonico et al. (2019; 2020). The optimal bandwidth is calculated with respect to the ever outcome and held fixed for all other time horizons. Vertical dashed lines indicate 90 percent confidence intervals, with standard errors clustered at the state level. See the notes to Table 5 for additional details on the sample and estimation.

Table 1: Testing Characteristics of Marginal Winners Across Gender

	Sample Mean	Female-Male Differential	
		Same-Gender Elections	Mixed-Gender Elections
Panel A: Election Characteristics	(1)	(2)	(3)
Term Length	2.322	−0.008	−0.014
	(0.739)	(0.013)	(0.016)
Number of Candidates	2.159	−0.002	−0.001
	(0.418)	(0.032)	(0.031)
Panel B: District Characteristics			
Share Incumbent Ran	0.521	−0.013	0.007
	(0.243)	(0.013)	(0.008)
Share Unopposed Elections	0.215	−0.017	−0.003
	(0.275)	(0.010)	(0.008)
Margin of Victory	0.300	−0.018**	0.001
	(0.189)	(0.009)	(0.006)
Share Mixed-Gender	0.170	0.051***	−0.026
	(0.219)	(0.015)	(0.017)
Number of Candidates	1.851	0.018	−0.002
	(0.421)	(0.012)	(0.013)
Panel C: Candidate Characteristics			
Previous Terms Served	0.714	0.417***	−0.478***
	(1.496)	(0.139)	(0.098)
Sitting Incumbent	0.265	0.158***	−0.130***
	(0.441)	(0.054)	(0.040)
First-Time Candidate	0.580	−0.300***	0.225***
	(0.494)	(0.055)	(0.038)
Democrat	0.518	0.029	0.247***
	(0.500)	(0.056)	(0.058)
Republican	0.461	0.004	−0.243***
	(0.499)	(0.060)	(0.058)
Candidates	29,042	19,026	10,016

Note: This table reports results testing whether marginal female and male winning candidates are comparable. The sample contains first-time winning candidates. Column 1 reports sample means and standard deviations across all winning candidates in Columns 2 and 3. Columns 2-3 report coefficients from an indicator for a female candidate. Column 2 uses first-time same-gender elections and Column 3 uses our estimation sample. The outcomes in Panel B are calculated as the mean of all previous elections in that district. Margin of victory in panel B is calculated using opposed elections and share mixed gender is calculated using races where candidate gender composition is known. In the regressions, the margin of victory is positive for female candidates and negative for male candidates. All specifications are weighted using a triangular kernel, use the optimal bandwidth from Calonico et al. (2019; 2020), and include constituency and election year fixed effects, as well as controls for the type of election, and separate male and female measures of the margin of victory. Standard errors clustered at the state level are reported in parentheses. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Table 2: Summary Statistics

	Estimation Sample		All Elections	
Panel A: Election Characteristics	(1)		(2)	
Term Length	2.298		2.308	
Number of Candidates	2.155		2.156	
Margin of Victory (Abs.)	0.137		0.276	
Panel B: District Characteristics				
Share Incumbent Ran	0.553		0.538	
Share Unopposed Elections	0.169		0.171	
Margin of Victory	0.256		0.292	
Share Mixed-Gender	0.197		0.170	
Number of Candidates	1.903		1.928	
	Female	Male	Female	Male
Panel C: Higher-Level Outcomes	(1)	(2)	(3)	(4)
Run in Any Higher-Level Election	0.034	0.051	0.044	0.056
Run in Any Congressional	0.030	0.043	0.037	0.047
Run in Any Gubernatorial	0.006	0.011	0.009	0.012
Run in House Primary	0.025	0.038	0.031	0.042
Run in House General	0.016	0.023	0.020	0.026
Win Any Higher-Level Election	0.022	0.030	0.027	0.033
Observations	6,932	7,804	22,753	106,905

Note: This table reports summary statistics for our estimation sample (after applying the Calonico et al. (2019; 2020) bandwidths associated with any higher-level candidacy) and the top-two candidates from contested state legislative elections. In Panels A and B, Column 1 reports means for our estimation sample and Column 2 reports means for contested state legislative elections. Means in Panels A and B are calculated across gender. Means in Panel B are calculated using all previous state legislative elections. Margin of victory includes only contested elections and share mixed gender is calculated using races where candidate gender composition is known. In Panel C, Columns 1 and 2 report higher-level outcomes for candidates in our estimation sample and Columns 3 and 4 report higher-level outcomes for candidates in contested state legislative elections. See Section II for additional details on sample construction.

Table 3: Balance Tests

	Sample Mean	Woman Won	Man Won
Panel A: Election Characteristics	(1)	(2)	(3)
Term Length	2.280	−0.000	−0.002
	(0.697)	(0.013)	(0.016)
Number of Candidates	2.163	0.025	−0.004
	(0.418)	(0.035)	(0.022)
Panel B: District Characteristics			
Share Incumbent Ran	0.558	0.007	−0.000
	(0.214)	(0.010)	(0.006)
Share Unopposed Elections	0.180	−0.000	−0.000
	(0.237)	(0.008)	(0.007)
Margin of Victory	0.296	−0.010	−0.001
	(0.171)	(0.006)	(0.006)
Share Mixed-Gender	0.197	−0.000	0.019
	(0.213)	(0.018)	(0.012)
Number of Candidates	1.914	0.004	0.008
	(0.398)	(0.014)	(0.011)
Panel C: Candidate Characteristics			
Previous Terms Served	0.514	−0.033	−0.100
	(1.368)	(0.022)	(0.159)
Sitting Incumbent	0.167	−0.015	−0.086**
	(0.373)	(0.022)	(0.037)
First-Time Candidate	0.740	0.020	0.117*
	(0.438)	(0.028)	(0.062)
Democrat	0.463	0.043	0.001
	(0.499)	(0.055)	(0.030)
Republican	0.488	−0.050	0.004
	(0.500)	(0.049)	(0.035)
Candidates	25,233	–	–
Elections	16,161	–	–

Note: This table reports sample means and balance tests for state legislative election, district, and candidate characteristics. The dependent variable is listed in each row. Column 1 reports means and standard deviations for the entire first-time mixed-gender sample. Columns 2 and 3 report coefficients from a regression discontinuity of the dependent variable on an indicator for if the female or male candidate won the election. The outcomes in Panel B are calculated as the mean of all previous elections in that district. Margin of victory includes only opposed races and share mixed gender is calculated using races where candidate gender composition is known. All specifications are weighted using a triangular kernel, use the optimal bandwidth from Calonico et al. (2019; 2020), and include constituency and election year fixed effects, as well as controls for the type of election, and separate winner and runner-up measures of the margin of victory. Standard errors clustered at the state level are reported in parentheses. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Table 4: Effect of Winning a State Legislative Seat on Higher-Level Candidacy, by Gender

	Dependent Variable: Ever Run in Any HIgher-Level Election					
	Base Model	Add Legis. Experience	Add Party	Add Election Type	Add Term Length	Add Total Candidates
Panel A: Women	(1)	(2)	(3)	(4)	(5)	(6)
Won	0.024	0.023	0.023	0.023	0.023	0.023
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
Control Mean	0.014	0.014	0.014	0.014	0.014	0.014
Observations	6,932	6,932	6,932	6,932	6,932	6,932
Panel B: Men						
Won	0.071***	0.071***	0.070***	0.070***	0.070***	0.070***
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Control Mean	0.019	0.019	0.019	0.019	0.019	0.019
Observations	7,804	7,804	7,804	7,804	7,804	7,804
p-value $Won_W = Won_M$	0.040	0.040	0.040	0.041	0.041	0.042

Note: This table reports estimates of the gender gap in higher-level candidacy under different specifications. The dependent variable is equal to one if the candidate ever runs in any higher-level election and is zero otherwise. The sample includes first-time mixed-gender state legislative elections in our estimation sample. Column 1 presents results using our baseline specification, with the optimal bandwidth from Calonico et al. (2019; 2020) calculated separately by gender. Columns 2-6 iteratively add candidate- and election-level controls and include all previously added controls. All specifications are weighted using a triangular kernel, include constituency and election year fixed effects, and control for the margin of victory separately for winning and losing candidates. Standard errors clustered at the state level are reported in parentheses. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Table 5: Effect of Winning a State Legislative Seat on Higher-Level Candidacy, by Election Type and Gender

	Dependent Variable: Ever Run in				
	Any HLE	Any Cong.	Any Gov.	House Primary	House General
Panel A: Women	(1)	(2)	(3)	(4)	(5)
Won	0.023	0.026	0.018	0.028*	0.016
	(0.017)	(0.017)	(0.015)	(0.016)	(0.014)
Control Mean	0.014	0.014	0.003	0.012	0.007
Observations	6,932	5,555	3,061	6,142	6,717
Panel B: Men					
Won	0.070***	0.070***	0.005	0.058***	0.049***
	(0.015)	(0.019)	(0.006)	(0.017)	(0.014)
Control Mean	0.019	0.019	0.002	0.016	0.009
Observations	7,804	6,940	7,422	7,185	5,764
p-value $Won_W = Won_M$	0.042	0.082	0.409	0.201	0.126

Note: This table reports estimates of the gender gap in higher-level candidacy for different positions. The dependent variable is equal to one if the candidate ever runs in the election listed in the column header and is zero otherwise. The sample contains first-time mixed-gender state legislative elections within the optimal bandwidth from Calonico et al. (2019; 2020) calculated separately by gender. All regressions are weighted using a triangular kernel, include constituency and election year fixed effects, the full set of candidate and election controls, and control for the margin of victory separately for winning and losing candidates. Standard errors clustered at the state level are reported in parentheses. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Table 6: Effect of Winning a State Legislative Seat on Higher-Level Representation, by Election Type and Gender

	Dependent Variable: Ever Win				
	Any HLE	Any Cong.	Any Gov.	House Primary	House General
Panel A: Women	(1)	(2)	(3)	(4)	(5)
Won	0.016	0.007	0.007	0.014	0.004
	(0.016)	(0.015)	(0.008)	(0.015)	(0.007)
Control Mean	0.009	0.008	0.001	0.007	0.001
Observations	6,164	7,193	2,718	6,751	5,403
Panel B: Men					
Won	0.049***	0.051***	−0.004	0.048***	0.011**
	(0.014)	(0.016)	(0.004)	(0.015)	(0.006)
Control Mean	0.012	0.013	0.001	0.011	0.000
Observations	5,969	5,368	7,205	6,010	6,697
p-value $Won_W = Won_M$	0.157	0.064	0.215	0.137	0.459

Note: This table reports estimates of the gender gap in higher-level representation for different positions. The dependent variable is equal to one if the candidate ever wins the election listed in the column header and is zero otherwise. The sample contains first-time mixed-gender state legislative elections within the optimal bandwidth from Calonico et al. (2019; 2020) calculated separately by gender. All regressions are weighted using a triangular kernel, include constituency and election year fixed effects, the full set of candidate and election controls, and control for the margin of victory separately for winning and losing candidates. Standard errors clustered at the state level are reported in parentheses. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Table 7: Testing for the Presence of Heterogeneous Treatment Effects in Candidate Characteristics

	Dependent Variable: Ever Run in Any Congressional Election						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Female-Male Differential	−0.043*	−0.046*	−0.046*	−0.043*	−0.040*	−0.041*	−0.040
	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)
Win x Experience		−0.004					−0.003
		(0.006)					(0.006)
Win x Incumbent			−0.023				−0.039*
			(0.014)				(0.023)
Win x First-Time Candidate				−0.000			−0.026
				(0.014)			(0.020)
Win x Democrat					−0.013		−0.013
					(0.013)		(0.014)
Win x Republican						0.008	–
						(0.012)	
Control Mean	0.017	0.017	0.017	0.017	0.017	0.017	0.017
Observations	12,495	12,495	12,495	12,495	12,495	12,495	12,495
p-value on Joint F-test	–	–	–	–	–	–	0.222

Note: This table tests for heterogeneous treatment effects by candidate characteristics. Female-Male differential represents the estimated gender gap in Congressional candidacy. Column 1 reports the difference in the gender-specific coefficients from Column 2 of Table 5. Each column adds the listed interaction of an indicator for winning an election and the listed covariate. Column 7 includes all interactions. The listed p-value tests the joint significance of all interaction terms. See the notes to Table 5 for additional details on the sample and specification. Standard errors clustered at the state level are reported in parentheses. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Table 8: Effect of Winning a State Legislative Seat on Subsequent State Legislature Candidacy, by Gender

	Dependent Variable: Incumbent Runs In Next Election				
	Base Model	Add Legis. Experience	Add Party	Add Term Length	Add Total Candidates
Same Seat	(1)	(2)	(3)	(4)	(5)
Panel A: Women					
Won	0.826***	0.823***	0.823***	0.823***	0.824***
	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)
Dep. Var. Mean	0.288	0.288	0.288	0.288	0.288
Observations	5,334	5,334	5,334	5,334	5,334
Panel B: Men					
Won	0.690***	0.690***	0.690***	0.690***	0.690***
	(0.030)	(0.029)	(0.029)	(0.029)	(0.029)
Dep. Var. Mean	0.352	0.352	0.352	0.352	0.352
Observations	8,179	8,179	8,179	8,179	8,179
p-value $Won_W = Won_M$	0.000	0.000	0.000	0.000	0.000
Same State					
Panel C: Women					
Won	0.929***	0.926***	0.925***	0.925***	0.926***
	(0.022)	(0.023)	(0.023)	(0.023)	(0.023)
Dep. Var. Mean	0.320	0.320	0.320	0.320	0.320
Observations	5,178	5,178	5,178	5,178	5,178
Panel D: Men					
Won	0.783***	0.783***	0.783***	0.783***	0.783***
	(0.021)	(0.021)	(0.021)	(0.020)	(0.020)
Dep. Var. Mean	0.397	0.397	0.397	0.397	0.397
Observations	7,985	7,985	7,985	7,985	7,985
p-value $Won_W = Won_M$	0.000	0.000	0.000	0.000	0.000

Note: This table reports estimates of the gender gap in state legislature incumbent candidacy under different regression specifications. The dependent variable is equal to one if the incumbent candidate runs for the same seat or in the same state in the next election cycle and is zero otherwise. The sample includes state legislature first-time mixed-gender general elections within the optimal bandwidth from Calonico et al. (2019; 2020) calculated separately by gender. Columns 2-5 iteratively add candidate- and election-level controls and include all previously added controls. All regressions are weighted using a triangular kernel, include constituency, election year, and outcome year fixed effects, and control for margin of victory separately for winning and losing candidates. Standard errors clustered at the state level are reported in parentheses. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

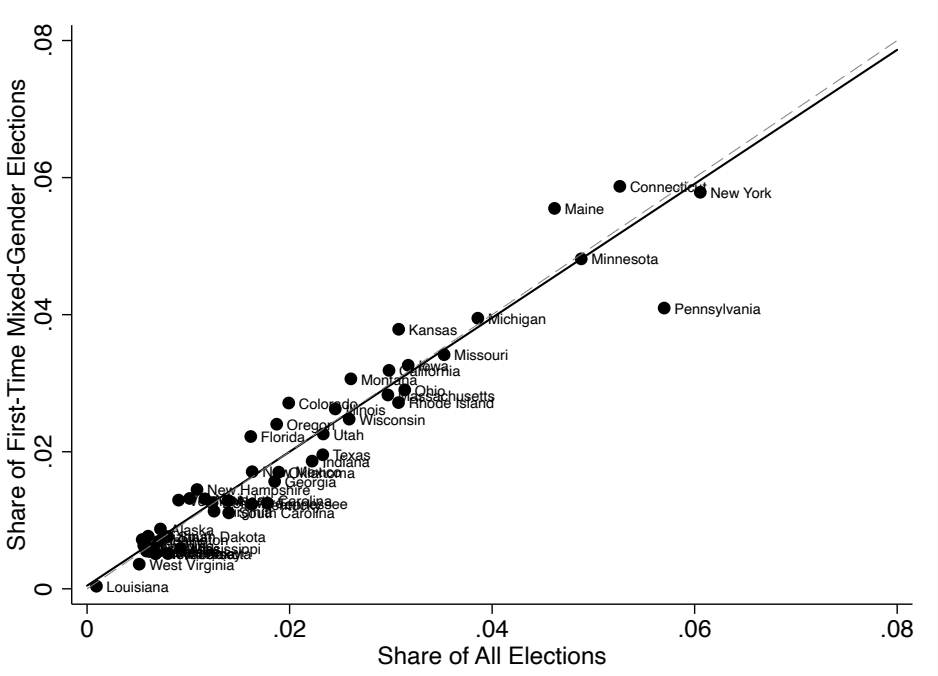
Table 9: Effect of Winning a State Legislative Seat on Congressional Candidacy in Different Subsamples, by Gender

	Dep. Var.: Ever Run in Any Congressional Election		
	Time Commitment	Distance to DC	Male Share of Legislature
Low	(1)	(2)	(3)
Panel A: Women			
Won	0.028	−0.005	0.055*
	(0.021)	(0.025)	(0.030)
Control Mean	0.010	0.014	0.012
Observations	4,107	3,219	2,879
Panel B: Men			
Won	0.061***	0.106***	0.043**
	(0.017)	(0.027)	(0.020)
Control Mean	0.019	0.020	0.019
Observations	5,195	3,205	3,116
p-value $Won_W = Won_M$	0.208	0.002	0.694
High			
Panel C: Women			
Won	0.009	0.049*	−0.010
	(0.039)	(0.026)	(0.033)
Control Mean	0.025	0.014	0.016
Observations	1,469	2,565	2,789
Panel D: Men			
Won	0.164***	0.049***	0.088***
	(0.047)	(0.016)	(0.022)
Control Mean	0.023	0.018	0.021
Observations	1,173	3,937	4,137
p-value $Won_W = Won_M$	0.016	0.994	0.023

Note: This table reports estimates of the gender gap in Congressional candidacy under in various subsamples listed in the column headers. Panels A and B report results for low or below-median splits and Panels C and D report results for high or above-median splits. In Column 1, we classify states based on expected time commitments from NCSL surveys of state legislators. Full-time states are on average 84 percent of a full-time job, and all other states are less on average. In Column 2 we classify states into below- and above-median distance to DC. In Column 3 we classify state-chamber-year legislative cohorts based on the fraction of seats which were won by men. The dependent variable is equal to one if the candidate ever runs in any Congressional election and is zero otherwise. All specifications are weighted using a triangular kernel, use the optimal bandwidth from Calonico et al. (2019; 2020) calculated separately by gender, and include constituency and election year fixed effects, as well as controls for the type of election, and separate winner and runner-up measures of the margin of victory. Standard errors clustered at the constituency level in Columns 1 and 2 and at the state level Column 3 are reported in parentheses. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

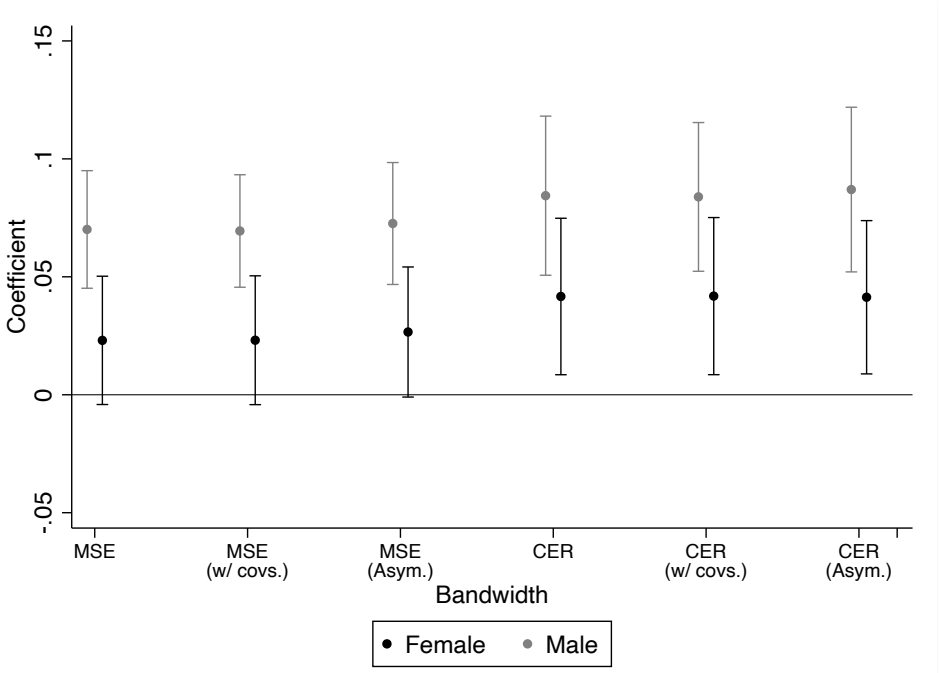
Appendix A: Additional Results

Appendix Figure A1: Share of All Elections Versus Share of Mixed-Gender Elections by State



Note: This figure plots the share of first-time mixed-gender single-member district elections against the share of all single-member district elections by state. The dashed line is the 45-degree line. The solid line plots the OLS line of best fit.

Appendix Figure A2: Testing Robustness of Estimates to Varying Bandwidths



Note: This figure reports estimates of the effect of winning a legislative seat on the probability of ever running for any higher-level office separately for men and women across varying bandwidths. All bandwidths are calculated using the procedures from Calonico et al. (2019; 2020). MSE and CER respectively denote mean squared error- and coverage error rate-optimal bandwidths. Covariates included in the calculation are the candidate and election level controls from the main text. Vertical lines indicate 90 percent confidence intervals with standard errors clustered at the state level. See the notes to Table 5 for additional details on the sample and estimation.

Appendix Table A1: Effect of Winning a State Legislative Seat on Additional Higher-Level Candidacy Measures, by Election Type and Gender

	Dependent Variable: Ever Run in					
	Any Primary	Any General	Governor Primary	Governor General	Senate Primary	Senate General
Panel A: Women	(1)	(2)	(3)	(4)	(5)	(6)
Won	0.023	0.018	0.018	0.007	−0.001	−0.005
	(0.015)	(0.015)	(0.015)	(0.008)	(0.007)	(0.007)
Control Mean	0.013	0.009	0.003	0.001	0.002	0.001
Observations	6,658	6,285	3,048	2,729	4,751	5,438
Panel B: Men						
Won	0.065***	0.051***	0.005	−0.004	0.009	0.002
	(0.016)	(0.014)	(0.006)	(0.004)	(0.006)	(0.005)
Control Mean	0.019	0.011	0.002	0.001	0.003	0.001
Observations	7,232	5,334	7,422	7,482	7,761	6,142
p-value $Won_W = Won_M$	0.061	0.136	0.404	0.210	0.330	0.374

Note: This table reports estimates of the gender gap in higher-level candidacy for different positions. The dependent variable is equal to one if the candidate ever runs in the election listed in the column header and is zero otherwise. The sample contains all first-time mixed-gender state legislative elections with the optimal bandwidth from Calonico et al. (2019; 2020) calculated separately by gender. All regressions are weighted using a triangular kernel, include constituency and election year fixed effects, the full set of candidate and election controls, and control for the margin of victory separately for winning and losing candidates. Standard errors clustered at the state level are reported in parentheses. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Appendix Table A2: Robustness of Effect of Winning a State Legislative Seat on Congressional Candidacy, by Gender

	Dep. Var.: Ever Run in Any Congressional Election		
	No First-Time Restriction	Add Same-Gender Elections	Both First-Time Candidates
Panel A: Women	(1)	(2)	(3)
Won	0.021***	0.030***	0.014
	(0.007)	(0.010)	(0.032)
Control Mean	0.012	0.011	0.011
Observations	10,009	8,703	2,255
Panel B: Men			
Won	0.047***	0.043***	0.094**
	(0.012)	(0.007)	(0.044)
Control Mean	0.017	0.016	0.019
Observations	9,755	21,094	1,855
p-value $Won_W = Won_M$	0.033	0.211	0.099

Note: This table reports estimates of the gender gap in Congressional candidacy under different specifications. Column 1 removes the first-time restriction, allowing candidates to appear in the sample multiple times. Column 2 adds first-time same-gender elections that occurred within the same district and a four-year bandwidth around the focal election from the estimation sample. Column 3 restricts the estimation sample to first-time mixed-gender elections where both candidates were competing for the first time. All regressions use the optimal bandwidth from Calonico et al. (2019; 2020) calculated separately by gender. All regressions are weighted using a triangular kernel, include constituency and election year fixed effects, the full set of candidate and election controls, and control for the margin of victory separately for winning and losing candidates. Standard errors clustered at the state level are reported in parentheses. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Appendix Table A3: Testing for the Presence of Heterogeneous Treatment Effects in District Characteristics

	Dependent Variable: Ever Run in Any Congressional Election						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Female-Male Differential	−0.044*	−0.044*	−0.044*	−0.044*	−0.043*	−0.043*	−0.043*
	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)
Win x Share Incumbent Won		−0.009					−0.012
		(0.030)					(0.033)
Win x Share Unopposed			0.010				0.006
			(0.029)				(0.062)
Win x Average Victory Margin				0.023			0.024
				(0.039)			(0.041)
Win x Share Mixed-Gender					0.026		0.030
					(0.031)		(0.032)
Win x Average Number of Candidates						−0.009	−0.008
						(0.021)	(0.040)
Control Mean	0.016	0.016	0.016	0.016	0.016	0.016	0.016
Observations	11,550	11,550	11,550	11,550	11,550	11,550	11,550
p-value on Joint F-test	–	–	–	–	–	–	0.865

Note: This tables tests for heterogeneous treatment effects by district characteristics. Female-Male differential represents the estimated gender gap in Congressional candidacy. Column 1 reports the difference in the gender-specific coefficients from Column 1 of Table 4 for the set of elections where we have non-missing data on district characteristics. Each column adds the listed interaction of an indicator for winning an election and the listed covariate. Column 7 includes all interactions. The listed p-value tests the joint significance of all interaction terms. See the notes to Table 2 for additional details on covariate construction and the notes to Table 5 for additional details on the sample and estimation. Standard errors clustered at the state level are reported in parentheses. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Appendix Table A4: State Congressional Characteristics Of Winning Candidates

	Primary Elections		General Elections	
	Sample Mean	Female-Male Differential	Sample Mean	Female-Male Differential
	(1)	(2)	(3)	(4)
Share with Incumbent	0.491	0.004	0.859	0.011
	(0.269)	(0.024)	(0.203)	(0.013)
Share with Female Incumbent	0.051	0.010	0.095	0.003
	(0.119)	(0.009)	(0.155)	(0.008)
Share Opposed Races	0.394	−0.010	0.978	−0.001
	(0.293)	(0.025)	(0.070)	(0.005)
Share Held by Own Party	0.490	−0.002	0.456	0.002
	(0.269)	(0.028)	(0.265)	(0.026)
Share Non-Freshman Incumbents	0.813	−0.019	–	–
	(0.212)	(0.016)	–	–
Share with Any Third-Party Votes	–	–	0.718	−0.005
	–	–	(0.345)	(0.015)
Observations	9,656	–	10,016	–

Note: This table reports state-level characteristics of House Congressional races in the first opportunity a winning candidate has to run. The sample contains all first-time mixed-gender election winning candidates. Primary elections include only Democrat and Republican winners and general elections include all winning candidates. Columns 1 and 3 report sample means and standard deviations for all winners of first-time mixed gender elections. Opposed races are races where multiple candidates receive votes. Columns 2 and 4 test differences between male and female winners using a regression discontinuity design, with the running variable re-defined to be positive for female winners and negative for male winners. All regressions use the optimal bandwidth from Calonico et al. (2019; 2020) and include year and state fixed effects. Standard errors clustered at the state level are reported in parentheses. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Appendix Table A5: Effect of Winning a State Legislative Seat on Congressional Representation in Different Subsamples, by Gender

	Dep. Var.: Ever Win Any Congressional Election		
	Time Commitment	Distance to DC	Male Share of Legis.
Low	(1)	(2)	(3)
Panel A: Women			
Won	0.016	−0.002	0.024
	(0.016)	(0.019)	(0.027)
Control Mean	0.006	0.009	0.008
Observations	4,183	3,501	3,184
Panel B: Men			
Won	0.038***	0.088***	0.036**
	(0.013)	(0.026)	(0.017)
Control Mean	0.010	0.013	0.013
Observations	5,700	2,841	2,577
p-value $Won_W = Won_M$	0.289	0.004	0.723
High			
Panel C: Women			
Won	0.008	0.018	0.024
	(0.035)	(0.019)	(0.022)
Control Mean	0.017	0.007	0.009
Observations	1,562	3,177	2,972
Panel D: Men			
Won	0.102***	0.024	0.069***
	(0.039)	(0.015)	(0.022)
Control Mean	0.020	0.012	0.012
Observations	1,268	3,372	3,881
p-value $Won_W = Won_M$	0.070	0.781	0.188

Note: This table reports estimates of the gender gap in Congressional representation under in various subsamples listed in the column headers. Panels A and B report results for low or below-median splits and Panels C and D report results for high or above-median splits. In Column 1, we classify states based on expected time commitments from NCSL surveys of state legislators. Full-time states are on average 84 percent of a full-time job, and all other states are less on average. In Column 2 we classify states into below- and above-median distance to DC. In Column 3 we classify state-chamber-year legislative cohorts based on the fraction of seats which were won by men. The dependent variable is equal to one if the candidate ever wins any Congressional election and is zero otherwise. All specifications are weighted using a triangular kernel, use the optimal bandwidth from Calonico et al. (2019; 2020) calculated separately by gender, and include constituency and election year fixed effects, as well as the full set of candidate and election controls, and separate winner and runner-up measures of the margin of victory. Standard errors clustered at the constituency level in Columns 1 and 2 and at the state level Column 3 are reported in parentheses. *** = significant at 1 percent level, ** = significant at 5 percent level, * = significant at 10 percent level.

Appendix B: Additional Calculations and Data Sources

This appendix describes the relevant details on how we map our empirical estimates on career progression to explaining a portion of the gender gap in Congressional candidacy in 2016. We also discuss our data sources and the process we use to match state legislative candidates to Congressional elections and construct our estimation sample.

A. Explaining the Gap in Congressional Candidacy

While we have established that the effect of winning a state legislature election on the probability that they compete for (win) a Congressional race is twice (four times) larger for men than women, it is also instructive to assess its importance relative to the overall gender gap in Congressional candidacy. To calculate such a figure, we first observe the gender gap in candidacy in the 2016 national elections: there were 1,820 men and 360 women who ran in either a primary or general election, resulting in the 2016 gender gap of 1,460 more men than women.[1] If we apply our point estimates to the number of women (6,209) and men (6,001) who won mixed-gender state legislature elections from 1988 to 2008, this results in an estimated 420.1 and 161.4 additional male and female Congressional candidates, respectively, arising from the set of state legislature elections to which our estimates apply. Thus, this predicted difference of 258.7 explains about 18 percent of the 2016 gender gap in Congressional candidacy.[2]

B. Data Sources

State Legislative Elections: Our primary data source comes from Inter-university Consortium for Political and Social Research No. 34297. This dataset contains the near-universe of state legislative elections for 1967-2010. Importantly, the data are organized at the candidate-by-year level, and include information on the seat contested (district and chamber), victory margin, winning status, party, number of votes received, candidate name, and number of other candidates in the race, among other relevant details.

Higher-Level Elections: We procure data on Congressional and gubernatorial elections from several sources. We first source House of Representatives primary data for 1968-2010 from Pettigrew, Owens, and Wanless (2014). We supplement these data with additional primary and general election returns for the House, Senate, and governor races using information from the Federal Election Commission and CQ Elections. Similar to the state legislative data, these data are organized at the candidate-by-year level and include information on the seat contested, victory margin, winning status, party, and number of votes received. Importantly, these data also include candidate names,

[1] See Kamarack et al. (2017) for more details.

[2] We chose the 20 year time horizon based on the fact that the experience effect dissipates after ten opportunities or 20 years, see Figure 6. If instead this window were shortened to only consider state legislators in the prior ten years, from 1998 to 2008, our effects explain 10 percent of the gap. When considering a 30 year window, we explain 25 percent of the 2016 gap.

which allow for linking across levels of government.

Congressional Biographical Data: Our data on the backgrounds of Congressional legislators come from two sources. First, we use the digitized records (ICPSR 7803) of the United States Congressional Biographical Data Series from 1789-1996. These data provide demographic information on all sitting Congressional members in both the House and the Senate. We supplement these records with contemporary data from the VoteSmart Biographical database, which provides demographic information for both Congressional and state legislative candidates post-1996.

C. Data Assembly

We implement the following procedure to create our estimation sample and main outcomes of interest.

1. We begin by determining the gender of each candidate in the state legislative data. We cross-reference each candidate's first name against records from the Census Bureau and the Social Security Administration (SSA) to obtain the probability that a candidate is male or female, after first cross-referencing candidates against lists of common first names. We code a candidate as female if *both* the Census Bureau and SSA records return a probability of greater than 70 percent and follow a similar process for male names. We can successfully determine a candidate's gender for over 95 percent of all candidates in the raw data. We hand code the remaining five percent where gender is ambiguous based on first name.

2. Next, we restrict the sample of state legislative elections to elections where the winner was awarded a seat in the next legislative session (e.g., we drop primary races). We then drop a handful of duplicate candidate observations. To improve the interpretability of our estimates, we further restrict the sample to single-member districts. That is, constituencies that elect a single member to the legislative assembly. Ten states have at least one multi-member district.

3. We then rank candidates based on their vote share within each state legislative election, where the winning candidate receives the largest vote share, the runner-up receives the second largest, and so on. During this step, we also identify (and later drop) any races where we do not know the gender of one of the top two candidates. For example, an election may be dropped if only the candidate's first initial is listed as a first name and we are unable to determine the candidate's gender during the hand-coding process.

4. We now turn to matching candidates across levels of government. We perform these processes separately for Congressional and gubernatorial elections, and separately by primary and general elections. Specifically, we match candidates using first and last name, and the first letter of the last name. To decrease the probability of spurious matches, we match can-

didates within-state, place greater weight on the last name and require that the first letter of the last name matches across datasets. We keep all perfect matches (i.e., where the first and last names both match perfectly) and manually review less-than-perfect matches.

5. Having merged state and higher-level records at the candidate level, we now turn to constructing our outcomes of interest. Specifically, we define a candidate as having "ever" run in a higher-level election if we match them across datasets and their candidacy occurs after the election of interest (e.g., they run for a Congressional seat in 1972 after having participated in a state legislative election in 1968). We zero-out any matches that occur before a state legislative election, although in practice this affects only a small handful of observations. We then construct dynamic measures of higher-level candidacy using the procedure outlined in the main text, that is based on the difference in years between when the candidate runs for a higher-level seat and the year they participate in a state legislative election. We also construct similar measures for winning a higher-level election or primary. Because our measures of higher-level general and primary election candidacy come from multiple sources, there may be differences in name quality across the two datasets, which can manifest themselves during the matching process. To ensure that we are accurately tracking a candidate's election history throughout all stages of the career, we assume that the primary is a stepping stone for the general election for Democrat and Republican candidates. Specifically, for candidates from these parties, we assume that if they appear in the general election, that they must also have run in (and won) the corresponding primary election. Note that this allows for independent and third-party candidates to run in the general election without participating (or being observed) in the primary process.

6. Finally, we perform the following restrictions to construct our estimation sample. First, we construct indicators for mixed-gender elections using the gender composition of the top-two vote-earning candidates. We then identify the first time a candidate participates in a mixed gender election, which yields the "first-time mixed-gender" sample. Note that because mixed-gender elections can occur at different points in a candidate's career, the number of candidates will not be exactly equal to twice the number of elections in the estimation sample. Second, we use only state-level elections through 2008, since we are unlikely to correctly link candidates across levels in this later time period given the short time horizon for the outcomes of interest.