



Men and women candidates are similarly persistent after losing elections

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Are women more likely to quit politics after losing their first race than men? Women's first-time candidacies skyrocketed in the wake of the 2016 presidential election. Yet we have little sense of the long-term impact of this surge in women candidates on women's representation writ large: Inexperienced candidates are more likely to lose, and women might be especially discouraged by a loss. This might make the benefits of such a surge in candidacies fleeting. Using a regression discontinuity design and data that feature 212,805 candidates across 22,473 jurisdictions between 1950 and 2018, we find that women who narrowly lose these elections are no more likely to quit politics than men who narrowly lose. Drawing on scholarship on women's lower political ambition, we interpret these findings to mean that women's decision-making differs from men's at the point of entry into politics—not at the point of reentry.

elections | risk aversion | rejection sensitivity | gender | ambition

In the wake of the 2016 presidential election, the number of women running for office for the first time skyrocketed (1). Given the benefits to symbolic, substantive, and descriptive representation elected women bring with them (e.g., refs. 2 and 3), many saw this surge as good news for democracy. Yet it is difficult to know whether these benefits are fleeting: Inexperienced first-time candidates are more likely to lose—and women did lose these races at higher rates (4). Deepening these concerns, some research suggests that women might be especially discouraged by a loss, perhaps due to their higher risk or competition aversion (5–7) or rejection sensitivity (8, 9). Rather than bolstering democratic representation, the surge of novice women candidates might simply be a “flash in the pan”: good news in the short term, but with no real effect in the long term.

These predictions raise an empirical question for women's electoral representation. Are women more likely to quit politics after losing than men? And if so, is this especially true for first-time candidates, who may be less “toughened” by prior campaign experiences? To answer these questions, we use data on elections at multiple levels of government in the United States. We use a design-based inference strategy to assess the causal impact of losing an election on the likelihood of running again. Using a regression discontinuity design (RDD), we compare men and women who have very narrowly won or lost elections, drawing on state and local election data that feature 212,805 candidates across 22,473 jurisdictions between 1950 and 2018. We find that, relative to narrow winners, women who narrowly lose elections are no more likely to quit politics than men who narrowly lose. We interpret this as evidence that women's decision-making about candidacy differs from men's at the moment of entry into politics—not at reentry. Those seeking to increase women's representation in politics thus should not overlook candidates who lost their first race: These women may represent one of the most cost-effective groups from which to recruit new candidates. But even without targeted recruitment, the increases in women's candidacies post-2016 are likely to persist for the foreseeable future, leaving lasting effects on women's representation in political office.

Rejection and Risk Aversion: Two Theories of Women's Political Ambition

Many scholars see women's lower political ambition than men as a primary driver of women's underrepresentation in politics (10). But why do women exhibit less interest in running than men? Scholars argue that women make more “relationally embedded” decisions (11, 12). Such work suggests that women will be risk averse when they perceive high opportunity costs to running and low odds of winning, and when they lack signals of support from others (13, 14). These claims, in turn, rest upon two theories of decision-making derived from other fields: risk aversion and rejection sensitivity.

Extensive literature in behavioral economics finds that women are more risk averse, more flexible in their social preferences, and more averse to competition than men (5). For instance, Niederle and Vesterlund (15) find that, conditional on ability, women are less likely to enter math competitions than men, mostly because men are overconfident. Buser et al. (16) show that even high-ability women students are much less likely to compete than equivalent men, and that willingness to compete predicts future career choices. Indeed, Adams and Funk (17) show that those women who do choose a competitive career—and end up as board directors—are even more risk seeking than their male counterparts, thanks to self-selection.

In the political realm, this phenomenon manifests in behavior variously termed “conflict seeking” among men or “competition aversion” among women (18). Kanthak and Woon (6) demonstrate, with a laboratory experiment, that men and women are

Significance

In this manuscript, we examine women's reactions to electoral losses to show that women candidates are no more dissuaded from seeking office again after losing than men are. We analyze elections across a broad range of geographies in the United States, focusing on local and state races where most candidates run for office. These results add depth to mainstream news coverage of the surge in women's candidacies following the 2016 presidential election, especially to more pessimistic coverage claiming the phenomenon would have little long-term impact. Contrary to those narratives, our results show that the surge in women candidates is unlikely to be a “flash in the pan” for women's political representation.

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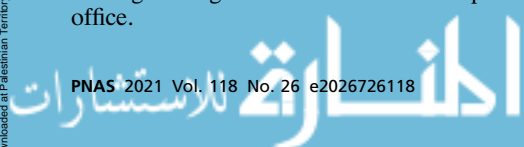
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equally likely to self-nominate when representatives will be chosen randomly, but women are less likely to self-nominate when the representative will be chosen by an election. Preece and Stoddard (7) corroborate this with a field experiment finding that priming politically active individuals to think about competition has a negative effect on women's interest in political candidacy but not on men's. However, using observational data, Folke and Rickne (19) find no gender gap in competition aversion among politicians in Sweden.

A smaller literature analyzes a related concept, termed "rejection sensitivity," which describes the responses of individuals to negative experience or loss (8, 9). It finds that women are more likely to withdraw from future competition after a loss (20), perhaps because women evaluate themselves more negatively than men when given subjective feedback and perceive feedback from others to be more ability-relevant information than men do (21, 22).

Some new research on politics suggests the same pattern: Wasserman (23) finds that narrowly losing close state and local elections makes women 25 percentage points less likely to run again in the next 4 y, while men who narrowly lose are only 16 percentage points less likely to run again. However, other research shows no gender difference in candidate persistence: Thomsen (24) shows that, in House races (both primary and general), women are no more or less likely to run again than men. Given the large difference between these findings, it remains unclear whether women respond differently to a loss than men, and, in turn, what the long-term impacts of the post-2016 surge in women's candidacies might be.

Although related, risk aversion and rejection sensitivity suggest different predictions about women's political behavior. Women's higher risk aversion suggests that many women may select out of competing altogether compared to similar men. Women's higher rejection sensitivity suggests that more women may select out of competing again after losing when compared to men. Previous research has already demonstrated that the first prediction—women's lower rates of emergence as candidates—holds in observational data, including in local elections (25). Unanswered, however, is whether women's behavior differs from men's at the point of reentry—whether, in the wake of loss, women are less willing to throw their hats into the ring again.

Data and Research Design

To answer this question, we use data on elections for multiple levels of government in the United States. In particular, we use data on local and state elections—settings that are important in their own right, as these levels of government are where the vast majority of candidates in the United States run for office (26) and where most women politicians serve in office (25). State and local governments are also where most potential federal candidates are likely to emerge for the first time (11, 27). If women select out of running—or running again—in smaller and lower-stakes races due to risk aversion or rejection sensitivity, they are unlikely to select back in when races are higher stakes. Accordingly, these races are the right place to assess when women drop out of the "pipeline" to power, and can give us a sense for what the gender composition of the national candidate pool may look like in years to come (28, 29). Studying these elections is therefore important for understanding the impact of the increases in women's candidacies on political representation in the United States as a whole.

We use data on 141,116 state legislative elections nationwide, 23,466 local elections from California cities and counties, and 9,132 mayoral elections across the country. We gather this broad dataset of subnational elections from a variety of sources: those collected by Klarner (30) for state legislative elections from 1967 to 2016, those collected by the California Elections Data Archive

(CEDA) (31) for county, city, community college, and school district elections in California from 1995 to 2018, and those collected by de Benedictis-Kessner (32) and de Benedictis-Kessner and Warsaw (33) for mayoral races in US cities from 1950 to 2014, updated to include additional data on mayoral elections through 2019 scraped from OurCampaigns.com. Together, these sources of data encompass 212,805 candidates across 22,473 jurisdictions between 1950 and 2018.

We use these data to compute several variables of interest. First, we construct a measure of the margin by which candidates won or lost a race. In races for an executive post or in a single-member district, this is a relatively straightforward calculation of the difference in the share of the vote between the top two candidates, one of whom won and the other of whom lost. For multimember posts, in which multiple candidates won within a single race, we calculate this as the difference between the share of the vote earned by the lowest-vote-earning winner and the top-vote-earning loser. This measure allows us to construct a measure in elections for both single-member and multimember posts that indicates a winning candidate (if above 50% vote share) and a losing candidate (if below 50%).* Second, we code the gender of candidates using their first names by assigning a probabilistic value to their gender based on the prevalence of their name in the US Social Security Administration's baby name database and assigning to each candidate a gender based on the majority gender of people matching the candidate's name in this database (34).† Finally, we construct our outcome variable—whether a candidate runs again in the future—using a binary variable for whether or not a candidate ran in a primary or general election in any future year within the dataset.‡

To analyze our data, we employ a research design, commonly used by scholars, of the incumbency advantage, to study the effect of winning an election (thus becoming an incumbent candidate in the next cycle) on future electoral success (e.g., refs. 35–38). RDDs can be used to identify the causal effect of winning an election on entry into (and success in) future elections. This design exploits the fact that the probability of a candidate winning her race changes discontinuously at 50% of the top-two-candidate vote share (39). Around this discontinuity, winning can be considered a near-random "treatment" of the outcome of an initial election on future candidate behavior (and electoral success). By comparing those candidates who barely won an election to those who barely lost, this design can identify the effect of winning relative to losing a race. As such, it also enables us to identify the causal effect of losing an election on future behavior.

We calculate the effect of losing by using an individual candidate's win margin to predict the probability that they will enter a future election. The difference in this probability between those candidates who barely lose compared to those candidates who

*We calculate this variable only for elections that result in candidate(s) taking office (not primaries or general elections that required runoffs), given that electoral entry in the next election for these races would be a mechanical result of the primary election rather than any active choice on the part of the candidates.

†We implement this coding using the gender package in R as described in Blevins and Mullen (34). This enables us to estimate the gender of 89.2% of all candidates.

‡Of course, candidates may also run for different offices in the future: State legislative candidates could go on to run for the US House, for instance. Our outcome measure is as open-ended as possible given the confines of the data, and counts running for any office within the dataset as "running again." This captures future electoral entry into any California local office for candidates from the CEDA dataset, but for the nationwide mayoral dataset and state legislative data only running again for the same offices. In addition, because each elections dataset is naturally truncated by its end date, we are unable to know or construct this outcome variable for the final election years in the data. Thus, for state legislative elections in 2015 and 2016, all California local elections in 2015–2018, and all mayoral elections in 2016–2019, all candidates necessarily have this outcome variable missing.

barely win represents the local average treatment effect of losing an election. Following the best practices described in Calonico et al. (40), we model the relationship between the treatment (losing) and outcome (future electoral entry) with local linear regression, use a bandwidth that minimizes mean-squared error, and estimate cluster-robust standard errors and CIs (41) that correct for remaining bias.[§]

The assumption underlying the RDD is that the distribution of potential outcomes is continuous at the treatment threshold. If candidates sort nonrandomly at the threshold, this assumption would be violated.[¶] A standard way to check whether this assumption holds is by examining the density of observations across the threshold: specifically, with a McCrary test (44). We conduct this diagnostic test and find a null result, which suggests the RDD can be used. We corroborate the McCrary test with a nonparametric test (45) and an equivalence test (12) for the density of observations as well. These multiple tests suggest that the assumption of continuity of potential outcomes is unlikely to be violated.[#]

Results

We begin by summarizing the descriptive differences in propensity to run again between all losing and winning candidates. Unsurprisingly, those who win their races are much more likely to run for office in subsequent elections. *SI Appendix, Fig. S2* shows how often candidates run again following wins and losses, separately, for state legislative candidates, all California local candidates, and nationwide mayoral candidates.^{||} Among state legislative candidates, winners are 51 percentage points more likely to run again than losers; among California local candidates, 18 percentage points; and, among nationwide mayoral candidates, 47 percentage points. This pattern aligns with much of the research on incumbency, electoral success, and the “scare-off” effect (e.g., refs. 32 and 46).

These patterns of electoral reentry among winning and losing candidates also appear when looking at only men or only women candidates. In all three of our elections datasets, propensity to run again after loss and propensity to run again after victory are similar for women candidates and men candidates (shown in *SI Appendix, Fig. S3*).

However, raw differences cannot identify the causal impact of winning or losing on a candidate’s future entry into a campaign: Candidates who lose an election by a large margin may be qualitatively different from those who win by a large margin. Comparing all winning and losing candidates may therefore conflate the effect of winning an election with, for instance, the effects of being better known and better funded. Our quantity of interest is whether losing candidates exit politics—specifically, the degree to which losing, rather than the host of other observed and unobserved characteristics that separate winners and losers, affects future electoral entry—and whether this differs by candidates’ gender, especially for first-time candidates. Disentangling these effects requires a more precise comparison.

Regression Discontinuity Estimates. To avoid these problems, we create extremely similar groups—those who barely lose and those who barely win—and compare them using an RDD. This

allows us to better understand the causal impact of losing (vs. winning) on the decision to rerun, by removing many other factors that might influence candidates’ decisions.

Our results, shown in Fig. 1, corroborate the descriptive findings above. Each panel in Fig. 1 bins candidates (the open circles) into groups of equal sizes by their win margin—the vote share by which each candidate won the election—along the horizontal axis. Candidates with a negative win margin, on the right of each panel, lost their election, while those points with a positive win margin, on the left, won their election. On the vertical axis, trend lines show the average probability of running again on either side of the win/lose threshold (at 0), using local linear regressions within the optimal bandwidth of vote share selected by *rdrobust* (40). Each panel of Fig. 1 shows a vertical drop in the probability of running again between the line on the left side of the vote share threshold and the right side, indicating the causal effect of losing rather than winning on candidates’ future electoral entry ($\hat{\tau}$). Across all types of elections—nationwide state legislative, California local, and nationwide mayoral races—losing candidates are less likely to run again in the future. The size of this effect varies between 14 percentage points (in California local races) and 38 percentage points (in state legislative races). A loss dissuades candidates from running in future elections, even when we compensate for observable and unobservable differences between winners and losers using this design-based inference strategy.

The Role of Gender. The central question motivating this paper, however, is not the overall effect of losing an election on future electoral entry, but whether candidates exhibit gendered responses to loss. To assess this question, we conduct the same analyses—again using the RDD framework—but separately for men and women. In Fig. 2, we present the RDD coefficients—the vertical drop between the two regression lines from Fig. 1—but separately estimated on the set of women candidates (plotted with purple circles) and men candidates (turquoise triangles), along with their robust 90% (thick lines) and 95% (thin lines) confidence intervals.^{**}

Across all three types of elections, we see no evidence of a gender gap in candidates’ responses to losing a race. For state legislative elections, men who lose are 38 percentage points less likely to run again, while women are 39 percentage points less likely. In California county, city, and school district elections, men and women are both 13 percentage points less likely to run again if they barely lose rather than barely win. In nationwide mayoral races, losing causes men to be 20 percentage points less likely to run again, while women are 32 percentage points less likely to run again. We see the same pattern of null differences by gender for first-time candidates as well, although the total effects of losing tend to be more discouraging (larger) for first-time candidates than they are for experienced candidates (see *SI Appendix, section G*). In none of these contexts or subsamples is the difference in the size of these effects by gender statistically distinguishable from zero.^{††}

^{**}Separate plots showing the full set of observations within the RDD bandwidth are presented in *SI Appendix, section E*.

^{††}To test for differences in the size of these effects, we conduct *t* tests with a null hypothesis of no difference between the effects among men and among women candidates. In all cases, we fail to reject the null hypothesis of no difference. For state legislators, the one percentage point difference between men and women is statistically insignificant ($p = 0.695$). The difference in California local races of 0.1 percentage points is similarly insignificant ($p = 0.974$). Although we do see a larger difference of 12.1 percentage points in nationwide mayoral races, it is still statistically indistinguishable from zero ($p = 0.117$). Although some approaches to balance and placebo tests have suggested the use of a null hypothesis of a difference between groups (e.g., refs. 47 and 48), distinguishing between groups of women and men candidates in this case is an example where the null hypothesis of no difference is more appropriate.

[§]We implement these procedures using the *rdrobust* package in R (42).

[¶]This assumption could also be violated if, as Caughey and Sekhon (43) show, some candidates are better able to win narrow victories because of more campaign experience or more money. Given the lack of broad data on candidate experience or fundraising in local elections, however, this assumption is not testable with the current data.

[#]The full results from these tests and histograms showing the density of observations across the threshold are presented in *SI Appendix, section A*.

^{||}In *SI Appendix, section D*, we also present rates of running again across the spectrum of candidate vote share values.

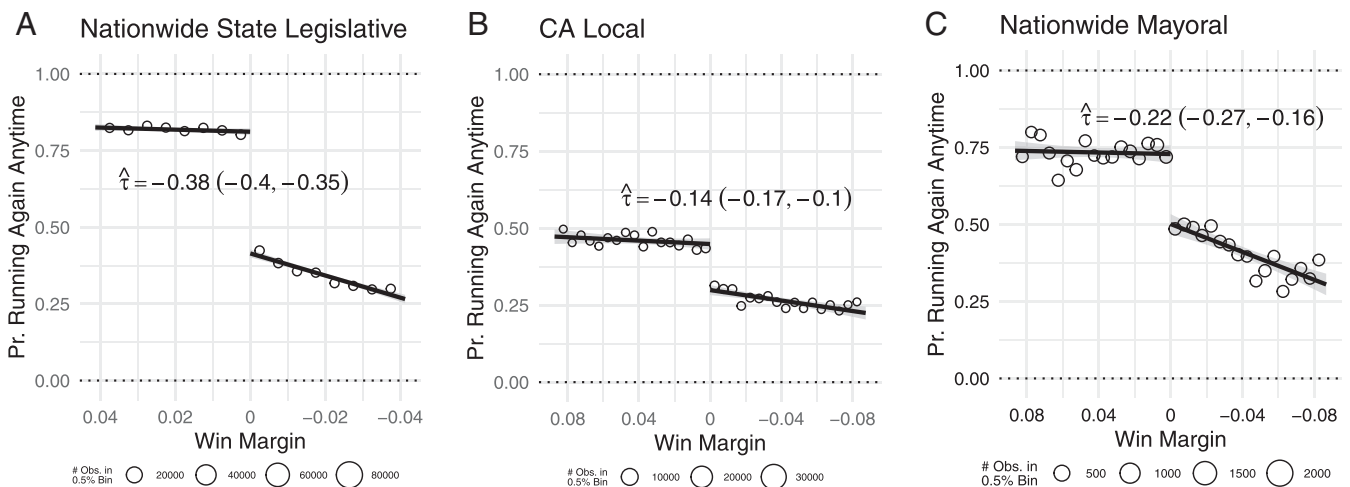


Fig. 1. (A–C) Regression discontinuity effects, by jurisdiction.

Discussion

Does the surge in first-time women candidates in US elections post-2016 have long-term consequences for women’s representation? In this paper, we address one piece of this puzzle: the effect of loss on candidates’ future electoral entry. Theories from political science, psychology, and economics suggest that rejection sensitivity or risk aversion among women might drive losing candidates to avoid running again—making an apparent positive development little more than a “flash in the pan.”

We use data encompassing seven decades of elections at the state and local levels combined with a causal research design to assess the impact of losing on both men and women candidates’ propensity to run in a future election. Our results suggest that, while losing candidates are universally less likely to run in the future, this effect of losing does not substantively differ between men and women.^{‡‡} In no type of election in our data are women candidates more sensitive to electoral losses than men. Contrary to fears expressed by pundits and scholars alike, the potential for many women candidates to be driven away from politics due to losing (relative to men) appears to be unfounded. The surge in women’s candidacies therefore seems to bode well for the future of women’s representation, both at the local and state levels we study here and at the national level if these candidates “move up” in years to come (49).

Why do we see something so different from what theories spanning political science, social psychology, and behavioral economics would seem to predict? Rather than rebutting previous theory, our results suggest a more nuanced theory of gender and political candidate persistence. While risk aversion may serve to keep women from entering politics at all (6, 7), the ones who do enter appear no more rejection sensitive than men candidates. The results corroborate research showing that the self-selection of risk-loving women into competitive careers may result in patterns of behavior that do not match those observed in the general population (17). Thus, the selection effects driving candidate entry can determine future candidate behavior.

However, our data can only illuminate decision-making among women and men who actually choose to run for office at least once. If some set of factors keep women from ever filing for candidacy at higher rates than men, we cannot causally iden-

tify what those factors are with this data. Recent work points to a variety of factors that inhibit women’s ambitions, from conflict aversion (18) to beliefs about recruitment (50) to the pressures of financially supporting one’s family (28). Although we cannot directly observe the comparison in our data, those women who choose to run for office are presumably a different “type”—distinguished, among other things, by higher risk acceptance and lower rejection sensitivity—than women in the general population. This, in turn, has implications for the recruitment of women, as the latest scholarship suggests that potential women candidates “have to be at least three times more likely to run than men for the gender disparity in candidates to close” (ref. 29, p. 990). Advocates and groups seeking to close that gap face high costs in identifying potential women candidates to whom they can target training programs or donations, and they rarely have unlimited resources with which to do so (51). Advocates, then, potentially face a trade-off between investing in

Jurisdiction

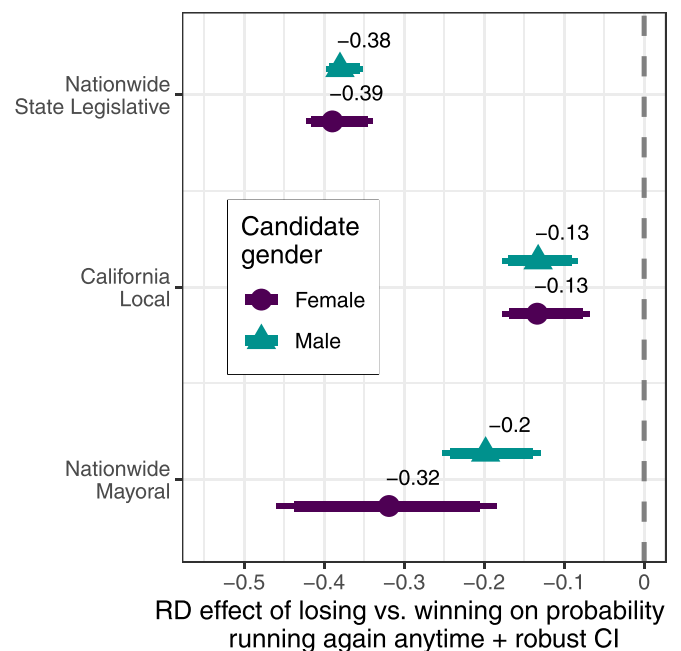


Fig. 2. Regression discontinuity effects, by gender.

^{‡‡} Women candidates are slightly less likely to run again overall than men, as we show in *SI Appendix, section D*; this is because women candidates are more likely to exit politics even when they win.

identifying new women and recruiting them to run for the first time or recruiting women who have lost to run again. If advocates do face this tradeoff, recruiting the latter—who have already demonstrated that they are the “risk-accepting” type—may be a fruitful way to further enlarge the pool of potential women candidates. Regardless, much like the “Year of the Woman” in 1992, the post-2016 surge has already created an increase in the base number of women candidates (and therefore repeat candidates in the future) such that women’s representation in politics is unlikely to return to pre-2016 levels.

We conclude that women’s decision-making differs from men’s at the point of entry into politics, not at the point of reentry. Our findings highlight how attention to selection effects can add nuance to existing theory on gender and political representation. Moreover, they imply that increasing the number of female representatives hinges on increasing the number of women earlier in the pipeline (29). Far from being “sore losers,”

women who run for office are just as likely to persist as men.^{§§} The post 2016-surge therefore seems likely to bring many new women into the pipeline in the longer term.

Materials and Data Availability. All data, code, and other materials to fully reproduce the results are publicly available at <https://doi.org/10.7910/DVN/TL22H9> (52). Previously published data were used for this work (30–33).

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^{§§}For example, see <https://www.foxnews.com/opinion/lisa-booth-democrats-the-party-of-sore-losers>.

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