Where Do Women Win Primaries?

Asymmetric Opportunity Theory in Congressional Nominations

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May 2025

Second Revised Version

We develop a party-asymmetric theory of gendered opportunity to explain how congressional primaries disadvantage women in different types of districts in distinct ways depending on partisan affiliation. Democratic women are disadvantaged in competitive districts, likely due to strategic discrimination, where party elites, donors, and primary voters prioritize "electability" and view men as safer choices, reducing women's success despite organizational efforts to support their emergence. In contrast, Republican women are disadvantaged in safe districts, likely due to conservative primary voters and policy demanders applying ideological purity tests and assuming female candidates are less conservative than their male counterparts, meaning many qualified Republican women opt not to run. We call this *asymmetric opportunity theory*, and test it on an original dataset of recent congressional primaries (2006–2020) using two-stage Heckman selection models. Democratic women were less likely to win primaries in competitive districts, and Republican women are less likely to run in the districts they are most likely to win general elections. We offer a new framework to understand women's descriptive representation in primary elections, highlighting the need for party-specific solutions to women's underrepresentation.

Keywords: women's representation, primary elections, partisan asymmetry, Congress, descriptive representation

A Novel Theory of Asymmetric Opportunity for Women

Women's descriptive representation in the U.S. Congress lags behind national legislatures in most other consolidated democracies (Monthly Ranking of Women in National Parliaments 2023). Two distinct features may be important in explaining women's underrepresentation in Congress: (1) the partisan asymmetry between the Republican and Democratic parties, and (2) the presence of intra-party primary elections that allow voters to select candidates. To explain this underrepresentation, we introduce a party-asymmetric model of gendered opportunity that we call *asymmetric opportunity theory*. Asymmetric opportunity theory helps explain how the same structural setting—a congressional primary—produces distinct disadvantages for women across different electoral spaces depending on partisan affiliation. We argue that Democratic and Republican women are disadvantaged in different types of districts for distinct strategic reasons. Though women in both parties face barriers, the sources and mechanisms of those barriers are conditioned in distinct ways by their parties' ideological positioning, donor networks, and electoral coalitions.

For Democrats, we argue that "strategic discrimination" (Bateson 2020; Luks and Schaffner 2019) or strategic avoidance (Ondercin 2022) is most acute in competitive districts, reducing the success of women candidates. Though Democratic elites and voters are generally more supportive of gender equity (Conroy 2019; Elder 2014), competitive districts raise the stakes of candidate selection and incentivize risk-averse behavior. In these districts, influential "coalitions of policy demanders" (Bawn et al. 2012)—including donors, activists, interest groups, and partisan media outlets, who play an important role during the nomination process (Hassell 2018; Masket 2009)—and the primary voters themselves favor male candidates under the belief that they are more "electable" in general elections. Strategic discrimination is partially connected to positional congruence in ideological terms, where perceptions of women as being more liberal make them less electable in competitive districts (Masket 2020).

Though the logic of strategic discrimination discourages women from running in Democratic primaries in competitive districts, the plethora of organizations such as EMILYs List

reflect the Democratic Party's commitment to gender parity and acts as a counterweight by specifically targeting competitive districts at the candidate emergence phase. Consequently, we see similar numbers of women running in Democratic primaries in these competitive districts. Yet, the logic of strategic discrimination means that these Democratic women who run for office are comparatively less successful at winning primary elections in swing or competitive districts because concerns about perceived electability override commitments to descriptive representation.

In contrast, Republican women are disadvantaged in safe districts for the party, where the electoral competition comes not during the general election, but in the primary itself. These districts are dominated by conservative policy demanders and primary voters, many of whom hold traditional views on gender roles and are skeptical of female candidates (Elder 2021; Wineinger 2018). Republican women face ideological purity tests, and "higher hurdles" (Shames 2018a) to access necessary resources to be competitive during the nominations (Elder 2012; Wineinger 2021; Wineinger and Nugent 2020), and most overcome assumptions that they are less conservative than their male counterparts, regardless of their actual policy positions (Och 2020). In response, Republican women opt out of running not because they are unqualified or unmotivated, but because they anticipate that the intra-party terrain is especially hostile. Safe districts, therefore, are the most unsafe for Republican women.

Integrating these two mechanisms—strategic discrimination in competitive Democratic districts and ideological gatekeeping in safe Republican districts—asymmetric opportunity theory accounts for variation in where women run for and are able to win congressional primaries. In this context, we understand gendered political ambition as a mediated process, where ambition is not simply an internal disposition but a rational calculation of external constraints and opportunities (Och 2020). We contend that these constraints and opportunities differ across partisan and electoral landscapes, moving beyond a universalistic or Republican-focused diagnosis of women's underrepresentation to understand the distinct gendered barriers for female candidates in each party during the nomination phase of the congressional election cycle.

We test our theory using an original dataset of 3,330 recent (2006–2020) contested congressional primary elections. We contend that congressional primaries have become more important in recent election cycles, evidenced by the increasing rates of contested nominations (Cowburn 2022a, 2024). As states and districts have become more consistently partisan (Wasserman and Flinn 2021), intra-party elections have become the main arena of democratic accountability in an increasing number of districts, making the nomination process more decisive in shaping the makeup of Congress. Given that our theory features two stages—women running for office, and women winning their primary—we use two-stage Heckman selection models to identify the spatial conditions under which women are more likely to run in and win congressional primaries.

Our empirical findings offer clear support for asymmetric opportunity theory. Democratic women in competitive general election districts were no (more or) less likely to emerge as candidates, but were significantly less likely to win primaries in these districts than Democratic women competing in less competitive districts. In contrast, Republican women were much less likely to run for office in highly conservative districts, even though those who did so were no less successful at winning primaries than their co-partisans in districts that were less favored for the party. For Democratic women, the *competitiveness* of the district in a general election is a key determinant of women's abilities to *win* primaries; for Republican women, the *partisanship* of the district is a key determinant of women's likelihood to *run*.

That Republican women are less likely to run for office in districts their party is most able to win in the November election appears one important driver of the partisan asymmetry in descriptive representation in today's Congress. Yet, women's descriptive representation in the Democratic Party also lags that of comparable national legislative bodies, likely in part due to strategic discrimination in competitive districts during the nomination phase. Taken together, these findings offer further empirical evidence that the nomination process continues to exacerbate the gender gap in descriptive representation in Congress (see also Shames 2018a), and posit new mechanisms by which it does so that vary by party.

Asymmetric opportunity theory therefore has implications for how we explain (the lack of) progress toward gender parity in U.S. politics at both the partisan and comparative levels. Our findings suggest that even well-intentioned party cultures (as in the Democratic Party) can replicate exclusionary outcomes when electoral incentives discourage risk-taking, while ideologically rigid environments (as in the GOP) create high barriers to entry for women regardless of their electability. It also implies that solutions to the problem of women's underrepresentation must be tailored: Democratic efforts might focus on disrupting electability biases in competitive races, whereas Republican efforts must confront ideological and cultural gatekeeping that constrains women in stronghold districts. Our theory not only explains observed asymmetries in women's emergence and success but also advances an approach for diagnosing and addressing the underrepresentation of women in both parties in Congress during the nomination process.

Descriptive Representation & Candidate Nomination

In recent elections to the U.S. Congress, more women have been elected than ever before. Yet, women still make up less than one-third of all elected members. The dearth of female representation in Congress is an issue of both supply and demand, as well as a consequence of structural elements of the electoral system—such as the incumbency advantage and absence of congressional term limits[1]—which impacts the political opportunity structure for (potential) candidates (Conroy and Green 2020; Fox and Lawless 2005; Hayes and Lawless 2015; Norris and Lovenduski 1993; Oliver and Conroy 2020; Thomsen and King 2020). Trends of women's representation in Congress since the 1990s have a clear partisan asymmetry, with the increasing numbers of women almost exclusively contained in the Democratic Party (e.g., Elder 2021). In the 101st Congress (1989–1991), forty-five percent of the women in the House and fifty percent of women in the Senate were Republicans; by the 118th Congress (2023–2025), just twenty-seven

[1] See Carroll, Dittmar, and Fox (2021) and Carroll and Sanbonmatsu (2013) for an alternative perspective on term limits.

percent of women in the House and thirty-six percent of women in the Senate were Republicans (History of Women in the U.S. Congress 2023).

Scholarship has long identified overt discrimination by voters and party gatekeepers as barriers to women's representation as elected officials, influencing women's success in both primaries and general elections (Lawless and Pearson 2008; Sanbonmatsu 2006a; Sanbonmatsu and Dolan 2009; Welch 1978). Female candidates face discrimination on account of negative attitudes about women's capacity for leadership roles, and negative attitudes toward women who compete for political power and influence. Stereotypes about women are less likely to overlap with attitudes about leadership than stereotypes about men (Bauer 2020; Koenig et al. 2011), putting women at an inherent disadvantage when competing against men for leadership roles.

Perceptions of women who vie for political power and influence are also negative due to the "double bind," which is when women must overcome gender stereotypes to demonstrate that they are strong leaders while simultaneously avoiding violating prevalent expectations about what it means to be a woman (Schneider and Bos 2014; Schneider, Bos, and DiFilippo 2022; Teele, Kalla, and Rosenbluth 2018).[2] By running for political office, female candidates are violating their traditional gender role by displaying behaviors incongruent with what is perceived as feminine, and they face a penalty as a result (Bauer 2017, 2020; Schneider, Bos, and DiFilippo 2022), which influences the type of women who run (Conroy and Green 2020; Oliver and Conroy 2020) and structures the pool of individuals who form the pipeline of *potential* candidates (Palmer and Simon 2008; Thomsen 2015; Thomsen and King 2020).

Though recent scholarship contends that partisanship and incumbency override gender bias in vote choice (Dolan 2014; Hayes and Lawless 2015; Ono and Burden 2019), female candidates remain disadvantaged, especially when qualifications are taken into account (Fulton 2012, 2014; Fulton and Dhima 2021; Lawless and Pearson 2008). Women are also more likely to attract competition from challengers once elected to Congress (Barnes, Branton, and Cassese

[2] As Eagly and Karau explain, "when a stereotyped group member and an incongruent social role become joined in the mind of a perceiver, this inconsistency lowers the evaluation of the person as an actual or potential occupant of that role" (2002, 574).

2017; Lawless and Pearson 2008; Palmer and Simon 2005). Consequently, women have to work harder to stay in Congress, competing more frequently in both primary and general elections (Anzia and Berry 2011; Bauer 2020; Pearson and McGhee 2013). Taken together, this means that those women who run for Congress are more ambitious, qualified, and capable, creating a gender qualifications gap on the supply side (Shames 2017a, 2017b). Despite these differences in candidate 'quality', women win elections at similar rates to men, indicating "an electoral penalty in and of itself" (Fulton and Dhima 2021, 1616).

The nomination process has long been said to disadvantage female candidates (Carroll 1994). Contested primary elections disproportionately hinder women, presenting challenges ranging from: displacing (disproportionately male) incumbents, ideological concerns about suitability, propensity to garner party support, and the ability to fundraise (Shames 2018a). Party-recruitment practices and primary support structure female candidates' decisions about running for office (Crowder-Meyer 2013; Karpowitz, Monson, and Preece 2017). If women perceive that they are unlikely to win due to primary voters' concerns about the suitability of women for public office, lack of organizational support from the formal party apparatus, or an absence of the necessary financial backing from the donor networks, they are less likely to run (Och 2020). Despite some evidence that female candidates perform as well as men when they run in primaries (Seltzer, Newman, and Leighton 1997), women have more reservations about running and receiving support than men, knowing that both parties' donor networks remain male dominated (Butler and Preece 2016; Fulton et al. 2006).

Partisan Difference

Though attitudes about women affect all female candidates, Republicans and Democratic voters are increasingly polarizing in their beliefs about women's roles in society and politics (Conroy 2019; Elder 2014), contributing to Democrats electing more women to political office (Shames 2018b; Thomsen 2015). Polarization on attitudes about gender roles and gender equality in the last several decades has meant the GOP is less welcoming to female candidates (Elder 2021;

Wineinger 2018),[3] where the party's rejection of group-based appeals and so-called "identity politics" creates additional barriers for women who wish to run for office (Elder 2012; Wineinger 2021; Wineinger and Nugent 2020). The primary has been identified as *the* key barrier to Republican women's descriptive representation in Congress, with GOP women facing greater challenges than their Democratic counterparts during the nomination (McCleskey et al. 2018; Shames 2018a).

Among Democratic voters, there is greater support for women in political leadership compared to Republican voters (Och 2020). Seventy-nine percent of Democratic and Democratic-leaning independents believe there are too few women in politics, compared to just thirty-three percent of Republican and Republican-leaning independents (Horowitz, Igielnik, and Parker 2018). This attitude is likely connected to gendered perceptions about suitability for politics, with recent polling finding that twenty-two percent of Republicans believe that men generally make better political leaders than women, compared to just four percent of Democrats (The State of Opinion Toward Gender, Power, and Policy 2023). This asymmetry may be exacerbated in primary elections, where voters are *perceived* by political candidates as being more polarized than in general elections (Anderson, Butler, and Harbridge-Yong 2020). Given that female candidates are perceived as more liberal by voters (Och 2020), the perception that primary voters are more polarized offers Democratic (Republican) women candidates additional (reduced) incentives to enter a primary on the grounds of ideological congruence.

Voters are not the only important actors in primary elections, where influential policy demanders play a crucial gatekeeping role during the nomination process (Hassell 2018; Masket 2009). In the Republican Party, these policy demanders hold more conservative views about the place of women in society (Dittmar 2015; Och 2020), likely negatively impacting the emergence and success of female candidates in their party. Beyond their position regarding the place of women, Republicans emphasize individual characteristics and are critical of group-based

[3] The regional realignment of the two parties in recent decades (with Republicans gaining ground in the South and Democrats gaining ground in the Northeast) has exacerbated the conditions that contribute to partisan asymmetry (Elder 2021).

representation (Grossmann and Hopkins 2016; Och 2018). These views hold even when these actors are themselves women (see e.g., Deckman 2016).

Funding opportunities during a primary are also asymmetric along partisan and gender lines; Democratic women are less likely to face a donation deficit relative to their male counterparts (Ondercin and Dalton 2023), whereas Republican women do (Cooperman and Crowder-Meyer 2018). Republican women with prior elected experience raise less money than equally qualified men, whereas qualified Democratic women raise more money than their male counterparts, likely widening the partisan gender gap (Kitchens and Swers 2016). Women are better represented among the Democratic Party's donor networks than their Republican counterparts (Crowder-Meyer and Cooperman 2018), with evidence of gendered donation patterns (Crespin and Deitz 2010; Ondercin and Dalton 2023).

The GOP historically preferred a more hands-off approach to congressional primaries compared to the Democratic Party's proactive engagement in supporting preferred candidates through endorsements and financial backing (Hassell 2018; Masket 2009). Yet, recent scholarship contends that this historical asymmetry no longer holds. The period we analyze is one of considerable transformation for the GOP, first captured by the insurgent Tea Party (see e.g., Blum 2020), and subsequently dominated by Donald Trump. These developments fundamentally altered the approach of actors within the Republican Party toward congressional primaries, inducing greater intra-party engagement and endorsement behavior (Blum, Cowburn, and Masket 2024) such that Republicans in Congress became more responsive to their primary electorates during this period (Cowburn and Theriault 2025).[4]

Among party elites, studies indicate that party chairs, for instance, prefer candidates who resemble themselves (Niven 1998) and the Democratic Party is more gender diverse than the GOP (Thomsen 2015). This asymmetry presents a self-reinforcing dynamic, because if women recruit more women "with each passing election cycle, there are quite simply more Democratic women

[4] This temporal shift further underscores the need to revisit historic trends in primary elections with more recent data.

than Republican women in positions to carry out this recruitment work" (Elder 2021, 22). That said, a conjoint experiment found neither party's chairs viewed female candidates as less viable than men (Doherty, Dowling, and Miller 2019). Yet, party leaders use distinct recruitment networks (Crowder-Meyer 2011, 2013), and Republican women are more likely than their Democratic counterparts to be recruited to run as "sacrificial lambs" (Stambough and O'Regan 2007). These "sacrificial lambs" compete in unwinnable November elections in a largely symbolic attempt to address the Republican Party's perceived "woman problem" with little or no organizational support (Och 2018). Consequently, Democratic women win primaries at roughly twice the rate of their Republican counterparts in all kinds of districts (Thomsen and King 2020).

In short, the extant literature identifies several mechanisms through which Republican women face "higher hurdles" (Shames 2018a) in primary elections, potentially leading them to conclude that running for office is not worth the cost (Och 2020).[5] To better understand the role of the nomination process in the underrepresentation of women in Congress, we first provide an update to the central findings of seminal works in this field focused on the asymmetry in women's descriptive representation (Palmer and Simon 2008, 2010; Shames 2017b). We begin by testing partisan asymmetry in a preliminary hypothesis to (1) identify whether the pattern observed in prior studies persists in our more recent dataset, and (2) assess whether these asymmetries warrant conducting our main analyses separately for each party.

In each of our hypotheses, our **a** hypotheses relate to our expectations about the conditions under which women will *run* and our **b** hypotheses relate to our expectations about whether women will *win* primaries. Importantly, our **b** hypotheses are expectations about where women win *conditional on running*. As discussed above, this preliminary hypothesis considers partisan (between-party) differences in the rates of women running in and winning congressional primary elections:

[5] Och notes that this leads Republican women to make strategic calculations that discourage candidacy, even in districts considered "safe" for the party in general elections, emphasizing that political ambition among GOP women is not an internal trait but is shaped by external constraints, including ideological gatekeeping, and the lack of institutional support and donor infrastructure within the party. Structural disincentives within the GOP therefore suppress candidacy before women even enter the race.

H1$_a$: Democratic women are more likely to run in primaries than Republican women.

H1$_b$: Democratic women are more successful at winning primaries than Republican women.

Given the extensive literature, we expect to find clear support for **H1$_a$** and **H1$_b$**, enabling us to perform our test of asymmetric opportunity theory—focused on within-party differences—separately by party.

District Partisanship & Competitiveness

Asymmetric opportunity theory posits distinct conditions under which women run in and win primaries across partisan electoral space. Our expectation is that Democratic women will be particularly unlikely to win primaries in competitive districts, but Republican women will be less likely to run in safe districts. This distinction is best understood in terms of variation in district *partisanship* and *competitiveness*. Given our discrete expectations, we break these dimensions into separate hypotheses then test each separately by party.

The differential pressures in primary elections identified above mean that women are strategic about the kinds of districts they run in (Carroll and Sanbonmatsu 2013; Ondercin 2022; Ondercin and Welch 2009; Palmer and Simon 2001). Simply measuring how often women win primaries is not sufficient for understanding how the nomination system relates to women's (lack of) descriptive representation, because not all districts are equal. Democratic (Republican) women are unlikely to advance to Congress by winning a primary election in a safe Republican (Democratic) district due to strong partisanship in general elections.

Inductive research on where women ran in and won congressional primaries and general elections from the 1950s to early 2000s identified characteristics of districts to develop the concept of "women friendly districts" (Palmer and Simon 2008). These districts are Democratic leaning, urban, less likely to be in the South, more racially diverse, older, more educated, and with higher incomes than districts where female candidates were less successful. More recent research has

expanded this work to explore how these conditions shape the decision to run through a partisan lens (Elder 2021; Ondercin 2022).

Existing literature finds important partisan differences in the kinds of districts women choose to run. For example, Democratic women have been shown to be more strategic about the kinds of districts they run in (Ondercin 2020), likely because they perceive a greater number of "winnable" districts. Democratic "women-friendly" districts tend to be more liberal, urban, wealthy, educated, and racially diverse than districts where male Democrats win; Republicans' "women-friendly" districts are more urban and racially diverse than districts where Republican men win (Palmer and Simon 2008). Put simply, there are just fewer districts that meet these Republican "women-friendly" criteria that are also winnable for the party in the November general election (Ondercin 2020).

Spatial differences are therefore more advantageous for Democratic women compared with Republican women. Democratic-leaning districts and states are more inclined to value progressive ideals, including gender equity in leadership, creating a supportive environment for female candidates, and a history of electing more women to office (Sanbonmatsu 2002b, 2002a, 2006b). In more liberal jurisdictions, local party organizations and donor networks more actively recruit women, shown to be a key determinant of rates of women running and winning the nomination (Crowder-Meyer 2013). Conversely, in heavily Republican districts, voters in both parties may be more inclined to prioritize traditional values that can disadvantage women candidates, and actors in the formal party may see limited benefit in going against the grain to try and nominate a woman. As discussed in the previous section, the two parties and the voting coalitions have distinct views about the role of women in politics, these between-party differences are reproduced within each party over partisan space (Elder 2014, 2021).

Given these district-level expectations and our expectations about partisan difference (**H1**), we analyze Democratic and Republican primaries separately. Yet, for both parties, the extant literature posits that more liberal districts are the most "woman-friendly" and are therefore the primaries that women are most likely to run in and win. These districts are more likely to be

won by the Democratic Party in the general election, a further way that the dynamics of the primary process foster asymmetric descriptive representation in Congress.

H2$_a$: Women in both parties are more likely to run in primaries in more liberal districts than in conservative districts.

H2$_b$: Women in both parties are more successful at winning primaries in more liberal districts than in conservative districts.

We also expect that district competitiveness will also play a critical role in shaping the pipeline of female candidates and their success with voters in primaries. Competitive districts often attract higher levels of investment from national parties and external organizations, and endorsements from prominent party leaders, creating both opportunities and constraints for women seeking to run. For Democrats, EMILYs List, the prominent and well-funded political action committee formed to elect pro-choice Democratic women, has been actively endorsing women in competitive primaries for decades, explicitly targeting competitive districts the last several cycles (Conroy 2024). Over time, Republican women have faced more competition in congressional primaries, and the reduced competition for Democratic women could be due to investment from EMILYs List, whose "fundraising may discourage other Democratic candidates from entering the race" (Thomsen 2019, 421). With Democrats' candidate pool growing, organizations formed to elect women can afford to invest in districts that are closer to a toss-up in the general election. These groups are "substantially more integrated" into the Democratic Party's organizational apparatus than their Republican counterparts (Crowder-Meyer and Cooperman 2018, 1212). Accordingly, we expect:

H3$_a$: Democratic (Republican) women are more (less) likely to run in primaries in competitive districts.

Yet, though Democratic women may be encouraged to run in competitive primaries, the psychological calculus of primary voters is a potential barrier to winning these races. Though Democratic voters tend to be less overtly sexist than their Republican counterparts, studies of

presidential primary voters identify "strategic discrimination", manifesting as withholding support for female candidates (Bateson 2020; Luks and Schaffner 2019). For example, Democratic activists and primary voters withheld support for their preferred female candidate in the 2020 presidential primaries out of concern that other voters would be less inclined to elect a woman (Bateson 2020; Masket 2020). Independent of sexist attitudes, concerns about 'electability' among Democrats decreased support for female candidates (Green, Schaffner, and Luks 2022). Similarly, in a 2019 Ipsos poll, seventy-four percent of Democrats and Independents said they were comfortable with a female president, but just thirty-three percent said that their "neighbors" would be (Nominating Woman or Minority Come Second to Nominating Candidate Who Can Beat Trump 2019). Relatedly, female candidates of both parties are perceived as more liberal (Huddy and Terkildsen 1993), compounding perceived 'electability' issue for certain races. These findings suggest that *perceptions* about the sexist views of other voters further hinder female candidates running in primaries in competitive districts, even as they compete for votes from those with more progressive gender views.

These studies and polls largely focus on the question of strategic discrimination and electability at the presidential level, yet a similar pattern likely replicates in congressional primaries. In seats that Democratic primary voters know will be highly competitive in the November general election, perceiving female candidates as being more liberal or less electable provides an incentive to support male candidates. Conversely, in safe districts for the Democratic Party, we might expect that progressive voters will be unconstrained by questions of electability or concerns about the sexism of other voters, safe in the knowledge that the party will win the seat in November and therefore vote for their preferred candidate. In these jurisdictions, being perceived as being more liberal likely serves as an advantage for female candidates (Anzia and Bernhard 2022).

If Republican primary voters behave strategically in primary elections then the inverse is true. In competitive states and districts, Republican primary voters have an incentive to nominate women as a way to signal ideological moderation and therefore broaden their appeal in the

November general election. Conditional on running, the path to the nomination for Republican women should be more favorable in competitive districts where their candidacies can resonate with broader appeals to diversity while still aligning with conservative values (Koch 2000). In safe seats, unconstrained by such strategic concerns, Republican primary voters and party elites may instead follow their conservative beliefs about the role of women's place in politics and therefore be more likely to nominate a man. We therefore hypothesize that:

> **H3$_b$**: Democratic (Republican) women are less (more) successful at winning primaries in competitive districts.

Yet, we also recognize the prior literature indicating that Democratic primary voters perceive electability in terms of ideological moderation whereas Republican primary voters' perceptions are more closely connected to candidate fundraising (Anderson et al. 2024). Other studies find that Democratic and Republican voters alike perceive that women are less electable than men (Hassell and Visalvanich 2024). In intra-party elections, Republican voters also prefer candidates with masculine traits (Karpowitz et al. 2024). Though Republicans might theoretically benefit—in Downsian terms—from nominating female candidates in competitive districts, these studies highlight several reasons why this logic may not hold in practice. We therefore expect to find weaker associations between district competitiveness and patterns of Republican women running and winning than we do for Democrats.

Data: Congressional Primaries in the Twenty-First Century

To test our asymmetric opportunity theory, we construct an original dataset that takes the primary contest as the unit of observation.[6] Our data include all U.S. House of Representatives and Senate primaries between 2006 and 2020 across forty-nine states, as Louisiana does not have congressional primaries.[7] For a primary to be considered contested, at least two names were

[6] The full dataset can be accessed at: https://doi.org/10.7910/DVN/D03ULS (Cowburn 2024b).
[7] In the 'Louisiana Primary' all candidates run on a single ballot on the general election date. If no candidate receives fifty percent of the vote, a run-off election is held. Given that participation in these 'primary' elections is more reflective of general elections, these contests were deemed sufficiently different as to

required on the ballot,[8] following the established literature (Ansolabehere et al. 2006).[9] A total of 7,402 potential nominations were included in the dataset, with candidates from 3,330 contested primaries analyzed. We include all candidates in our dataset, without restricting inclusion based on performance or financial thresholds.

The explicit focus on primary elections, the breadth and recency of our dataset, and the quantitative approach analyzing spatial variation in where women run and win contested primary elections are all benefits of our data and approach. To the best of our knowledge, no previous study has examined within-party variation in role of the nomination process in electing women in both parties[10] to Congress in such a granular way using a dataset that includes all primary elections over multiple recent election cycles. Shames (2017b) tackles a similar research question as H1 and H2 using data that span 1980 to 2012. We think that the recency of our data is a particular asset in terms of our empirical contribution given the fundamental changes in congressional primary elections (Cowburn 2024a) and the higher levels of women's representation in Congress in the twenty-first century (History of Women in the U.S. Congress 2023).

We consider candidates as having 'run' in a primary if they make it onto the primary ballot, and as having 'won' a primary if they are selected to represent the party in the general election, regardless of whether they finish first in the initial primary or if they win a run off. We code candidates as women when they identify as such in their campaign material, reference themselves as a woman in press interviews, or use she/her pronouns.[11] Our outcome in each stage

warrant exclusion. For the same reason, special elections for the Senate with this structure (e.g., Georgia 2020) were excluded.

[8] In the supplementary material, we demonstrate that our results are robust to the inclusion of a 15% electoral performance threshold to be considered as running.

[9] Under California and Washington's top-two system, a contest was considered as a 'party-primary' when two candidates from the same party stood in a primary election. Other scholarship on congressional primaries (e.g., Thomsen 2021a) divides top-two and blanket primaries along partisan lines in the same way.

[10] Several excellent within-party studies focus solely on the role of the nomination process in hindering Republican representation in Congress (McCleskey et al. 2018; Och and Shames 2018; Wineinger 2022).

[11] In our dataset, only one candidate—New York rapper Paperboy Prince—identified as nonbinary, for the purpose of this study they were grouped with the non-female candidates. Nonbinary candidates likely face even greater hurdles in election campaigns.

of our analysis are therefore dichotomous: (1) does a woman run in the primary; and (2) does a woman win the primary?

We limit our interest to recent election cycles given the concerted effort—particularly in the Democratic Party—to increase the descriptive representation of women during this period. Moreover, the period since 2006 allows us to collect a rich amount of data about individual candidates even in low-salience elections with the creation of Ballotpedia and the online presence of almost all candidates enabling us to accurately capture key dynamics of all races in the digital era.[12] Our data start in 2006, which has the advantage of coinciding with the end of the dataset used in Palmer and Simon's (2008, 2012) seminal studies on women's representation and "women-friendly" districts, allowing us to update these findings from the extant literature in our preliminary hypothesis.

In our preliminary hypothesis, we therefore simply test *partisan difference* (**H1**) at the between-party level such that party (Republican) serves as the key independent variable. We strongly expect to find a partisan difference in this preliminary test, allowing us to (1) determine if historic trends hold through to 2020, and (2) provide an empirical justification to perform our main analysis separately by party.

In our main analysis, we determine *district partisanship* (**H2**) and *district competitiveness* (**H3**) using the most well-known measure of district partisanship, the Partisan Voting Index (PVI) from the respective *Cook Political Report* (2017) following each election cycle. PVI gives districts a score of R+n or D+n, to indicate how a district or state leans compared to the nation based on the two-party presidential vote share in the last two elections. Presidential vote share has long been used as a measure of district partisanship (Canes-Wrone, Brady, and Cogan 2002; Downs 1957). We are interested in how primaries relate to the ability of female candidates to win and run in places where they might realistically expect to be able to win general elections, in other words, the *relative* district partisanship. We therefore rescale PVI into a relative + or − figure;

[12] The 2006 election cycle is also historically representative of the levels of incumbent competition since the late 1970s (Boatright 2013)

for example, an R+5 district would be a +5 district for the Republican primary and –5 for the Democratic primary.

Given our specific interest in whether women are likely to run or win as the district becomes increasingly competitive and this figure approaches zero, we include both PVI as our measure of *district partisanship* (**H2**), and the quadratic term (PVI^2) as our measure of *district competitiveness* (**H3**).

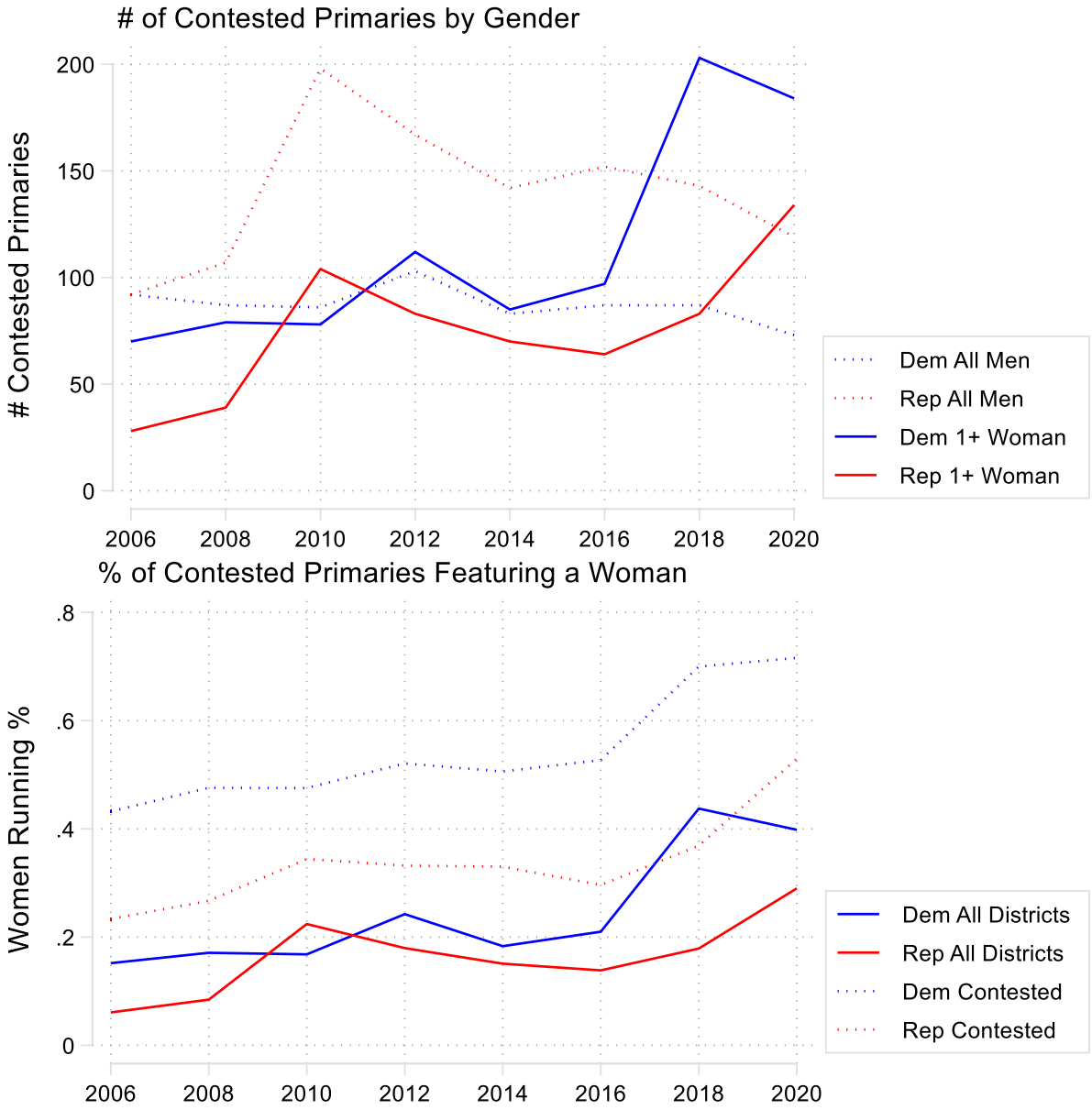
We include several additional controls in our empirical models based on the extant literature: primary type (open-seat, incumbent, challenger), percentage of women in the state legislature, district median income, district urbanness, district compactness, total campaign disbursement, chamber of Congress, number of candidates, and number of candidates squared. We provide further information about these variables alongside some empirical extensions investigating the importance of some of these variables in our supplementary material.

Asymmetry in Temporal Trends

In total, our dataset includes 3,330 contested primaries, of which 804 were won by women, 709 were won by men and featured a woman who lost, and 1,817 were all male. As part of our preliminary hypothesis on partisan difference (**H1**), we first present the temporal trends of women running in and winning congressional primaries by party, updating previous descriptive work by Political Parity (Shames 2017b). In Figure 1, we present the trends of numbers and percentages of women *running* in contested primaries. In Figure 2, we present the same trends of women *winning* contested primaries.[13] These preliminary descriptives offer initial evidence that more women run in primary elections as Democrats, and that more Democratic primaries are won by women.

[13] We present both trends by incumbent status in the supplementary material.

***Figure 1**: # and % of Primaries Featuring a Woman*



In terms of running for Congress, the clear uptick in the number of women running is shown in the increasing numbers of contests that feature at least one female candidate during this period, as shown in Figure 1.[14] This coincided with a comparative decline in all-male contests such that by the end of this period roughly two-thirds of Democratic and half of Republican primary fields featured at least one woman. Given that the number of contested primaries fluctuates each election cycle (Boatright 2014; Cowburn 2022b, 2024; Hirano and Snyder 2019), we also show the percentage of districts and contested primaries that featured at least one woman in the second panels of both figures. Both trends demonstrate a similar recent uptick that is more

[14] These trend align with descriptive findings for earlier election cycles shown elsewhere (Shames 2017b).

prominent among Democrats. By 2020, more than twice as many districts featured at least one female primary candidate than they had done in 2006.

***Figure 2**: # and % of Contested Primary Winners by Gender*

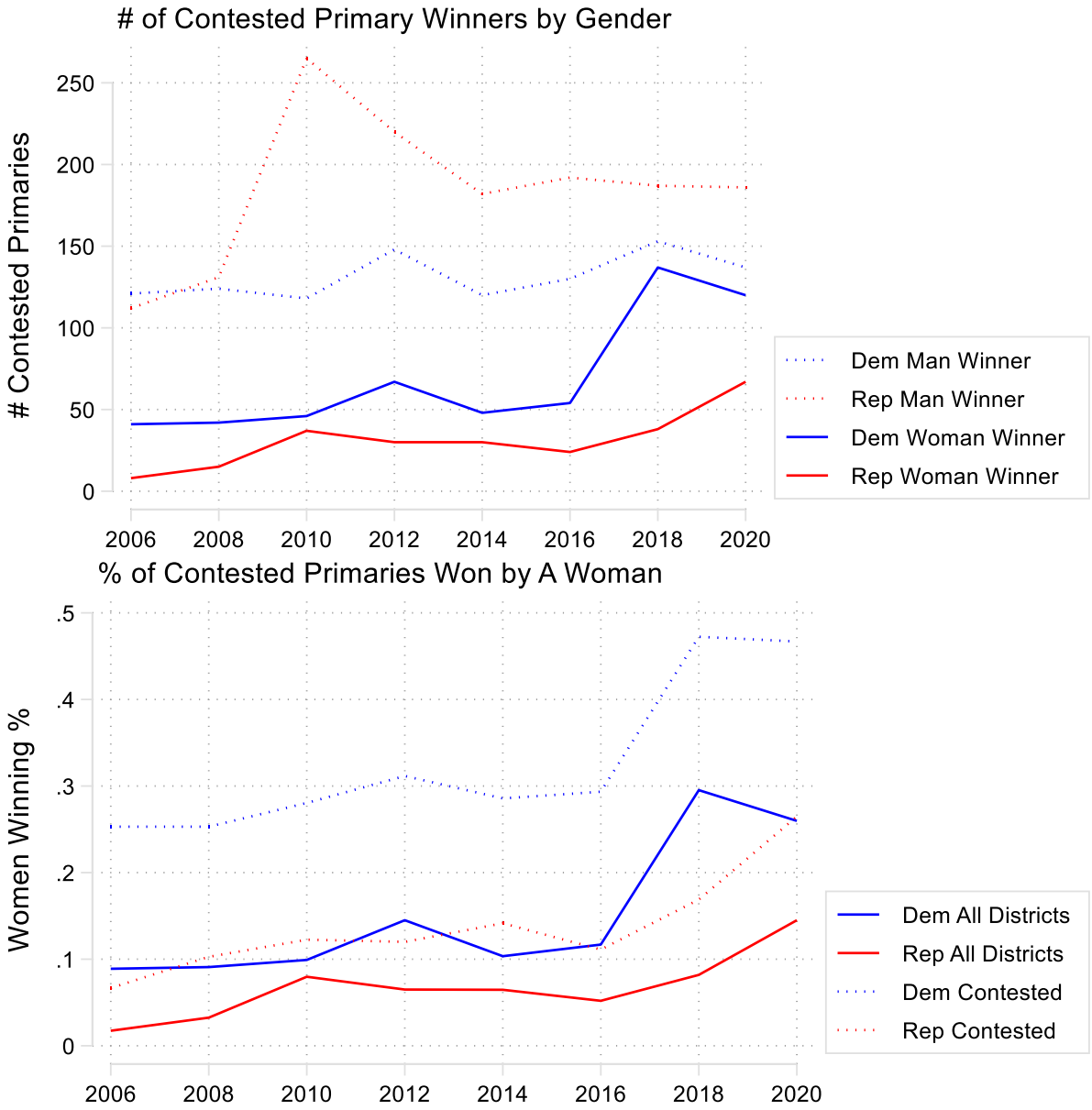


Figure 2 shows that more women also won primaries toward the end of this period, though most congressional primary winners in both parties were still men. The gap between male and female primary winners noticeably declined in the Democratic Party from 2018, onwards with almost half of contested primaries being won by women in 2018 and 2020 (see also Thomsen 2021b). A smaller uptick in the number and rate of women winning Republican primaries was observed in these election cycles. The substantial increase in the number of contests featuring and being won by women in the past few election cycles—especially, but not exclusively, in the

Democratic Party—further underscores the need for additional research that focuses on *recent* primary competition.

Analyses

Given that winning a primary is conditional on running, we use a two-stage Heckman selection model to eliminate bias from unobserved factors that influence both selection and outcome (Heckman 1979). Empirically, we perform a probit analysis to determine the likelihood of a woman *running* as the first (selection) stage (our **a** hypotheses). In the second (outcome) stage, we use an equation based on the first-stage binary probit model to determine the likelihood of a woman *winning* (our **b** hypotheses). In addition to the controls discussed above, we include year fixed effects given the temporal trends in our data, and state fixed effects given the variation in the rules and organization of party primaries.[15]

We again demonstrate the partisan difference in women running ($\mathbf{H1_a}$) and winning ($\mathbf{H1_b}$) congressional primaries using these empirical models, with the results presented in Table 1. In line with our expectations and the partisan temporal trends shown above, Republican women were less likely to run in or win partisan primaries than their Democratic counterparts. The clear partisan difference in the numbers of women running for and winning primary elections in this preliminary analysis, (1) provides an update to the seminal studies in the field (Palmer and Simon 2008, 2010; Shames 2017b), and (2) offers the empirical justification for performing our test of asymmetric opportunity theory separately by party.[16]

[15] We present a series of robustness checks in the supplementary information.

[16] In the supplementary material we also run a combined model. The coefficient for party in that model is—unsurprisingly—substantive and significant.

***Table 1**: Preliminary (Between-Party) Findings*

	Running (a hypothesis)	**Winning (b hypothesis)**
Republican **(H1)**	-0.258***	-0.672***
	(0.090)	(0.049)
Observations	3,330	3,330

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Model shown is a two-stage selection model that includes the same variables as Table 2. Control variables not shown, full coefficients provided in the supplementary material.

Our full results testing asymmetric opportunity theory are shown in Table 2. In line with our expectations in $\mathbf{H2_a}$, our model indicates that Republican women ran less often in more conservative districts, as shown by the significant negative coefficient of District PVI in the first stage of the model. As outlined in the front of our paper, we believe that this finding is the result of a combination of Republican women's perceptions about primary voters' views about their suitability for office, and a lack of effort by the party organization to encourage women to run in districts that are more favored for the party in November general elections. In the first stage of our model, we observe no relationship between district partisanship and the likelihood of Democratic women to run for office ($\mathbf{H2_a}$). Similarly, we observe no linear relationship between district partisanship and women winning primary elections in either party ($\mathbf{H2_b}$).

***Table 2**: Heckman Two-Stage Selection Results*

	Running (a hypotheses)		**Winning (b hypotheses)**	
	Democratic	Republican	Democratic	Republican
District Partisanship: PVI +/- **(H2)**	0.003	-0.015***	-0.004	-0.004
	(0.006)	(0.005)	(0.003)	(0.005)
District Competitiveness: PVI $+/-^2$ **(H3)**	-0.000	-0.000	0.000***	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Observations	1,606	1,724	1,606	1,724
State FE	✓	✓	✓	✓
Year FE	✓	✓	✓	✓

Standard errors in parentheses

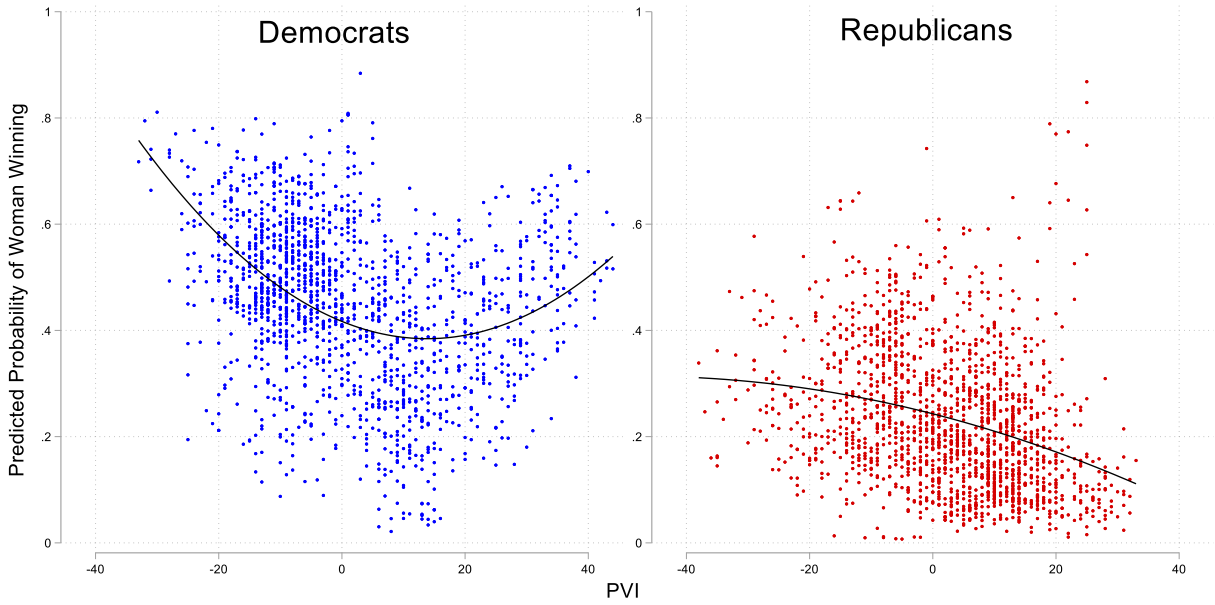
*** p<0.01, ** p<0.05, * p<0.1

Model shown is a two-stage selection model performed by party with state and year fixed effects. Control variables not shown, full coefficients provided in the supplementary material.

Table 2 also shows that women in both parties ran in primary elections at similar rates regardless of district competitiveness ($\mathbf{H3_a}$) as indicated by the non-significant coefficients in the first stage. In the second stage ($\mathbf{H3_b}$), the relationship between Democratic women winning the

primary and district partisan identity is u-shaped (concave), as indicated by the significant positive coefficient of the quadratic term.[17] In other words, Democratic women are less favored in more competitive districts, potentially connected to "strategic discrimination" by Democratic primary voters in these districts (Bateson 2020), or increased competitiveness (Barnes, Branton, and Cassese 2017). We find no significant association between district competitiveness and Republican women winning primaries ($\mathbf{H3_b}$).

***Figure 3**: Women Winning by District Partisanship*



Given the difficulties in interpreting outputs of Heckman models substantively—especially when quadratic terms are included—we present the predicted probabilities of women winning primaries graphically across values of district partisanship in Figure 3, with all other variables held at their mean or reference value.[18] These predicted values are derived from the model shown in Table 2 and therefore include variation both in rates of running and winning. At the inter-party level, Figure 3 shows that women win Democratic (left panel) more frequently than Republican (right panel) primaries across all levels of district partisanship. Women have a relatively high success rate in contested Democratic primaries across all districts, with an average predicted probability of winning that rarely drops below forty percent. This comparison indicates

[17] We present this below in graph format in Figure 3. For quadratic terms, a significant coefficient determines the direction of the parabola (u-shaped if > 0, inverted u-shaped if < 0). Though our results here identify a substantively "small" coefficient that does not mean the effect is trivial, where the quadratic term's statistical significance underscores the presence of a meaningful nonlinear effect.

[18] Given the inclusion of the squared term in the model, we use quadratic lines of best fit.

that the main partisan difference shown in Table 1 is not due to a subset of districts but holds regardless of district partisanship. Put simply, Republican women become their party's nominee less frequently regardless of district partisanship or competitiveness.

The intra-party level provides the true test of our asymmetric opportunity theory. Here, we observe clear evidence of the concave relationship between district partisan identity and women winning Democratic primaries, as shown by the significance of the quadratic term in Table 2 and the u-shaped line of best fit in Figure 3 (left panel). Democratic women are most able to earn the nomination in unwinnable districts that are safe for Republicans in general elections, and least likely to win districts that are competitive or somewhat favored for the party in the November election (EVEN to D+19). As districts become less competitive and more safely Democratic (above D+20), female candidates' predicted rates of success increase.

For Republicans, Figure 3 (right panel) demonstrates a negative relationship between district partisanship and the likelihood of a woman winning the primary. In other words, Republican women are least able to win primaries in those districts that they stand the most chance of winning election to Congress in November. As shown in Table 2, this relationship is connected to candidate emergence, with a substantively significant negative relationship in the first stage of the model and no significance in the second stage. Though the line of best fit in Figure 3 is slightly convex, Table 2 indicates no significant association with district competitiveness. In the most conservative districts where a Republican is near-certain to win the general election and advance to Congress, Republican women have only a one-in-ten likelihood of winning their party's primary, all else being equal.

Discussion and Conclusion

We introduce and empirically test a novel theory of asymmetric opportunity for women in congressional primaries to help explain women's continued underrepresentation in both parties in the U.S. Congress. We find clear evidence that Democratic women were particularly unlikely to

win primary contests in *competitive* general election districts whereas Republican women *run* less often in *safe* districts for the party. We call our framework *asymmetric opportunity theory.*

Before testing our asymmetric opportunity theory, we first temporally extend the long-identified trends of more women running and winning primary elections as Democrats than Republicans (see e.g., Palmer and Simon 2008, 2012; Shames 2017b). Though research suggests that much has changed in terms of the dynamics of congressional primary competition (Boatright 2013; Cowburn 2024a) in the decade or two since these seminal studies on female candidates, we show that the longstanding pattern of asymmetric partisan descriptive representation has persisted into the second decade of the twenty-first century.

Our main analysis empirically tests asymmetric opportunity theory, finding that the electoral conditions of the district matter in distinct ways for women running in primaries for each party. Democratic women were less likely to win congressional primaries in competitive and somewhat favored general election districts than their co-partisans in safe or unwinnable districts. Conversely, Republican women were particularly unlikely to run in districts that the party should expect to win in the November general election. We explain this partisan difference as being the result of a combination of electability perceptions and ideological gatekeeping by key policy demanders in the parties. Under both mechanisms, the stereotype that women are more liberal has distinct implications for female candidates in Republican and Democratic primaries.

For Democratic women, electability is connected to concerns about female candidates' ability to win general elections, as revealed by gendered patterns of primary success in competitive districts. We contend that, due to the number and resources of organization in the Democratic Party focused on group-oriented and identity-based descriptive representation, women are explicitly encouraged to run in these districts. Yet, when they do so, women win these primary elections less often than their co-partisans in less competitive districts, likely because policy-demanders in the party network and the primary voters themselves have concerns about the viability of female candidates in close general elections and "strategically discriminate" as a result.

For Republican women—especially those in conservative districts—electability may hinge on overcoming the stereotype of ideological moderation, which primarily affects their decision to run. Republican women perceive that they are less likely to win primaries when the primary electorate is highly conservative (Och 2020). Consequently, they throw their hat into the ring at lower rates in those districts most likely to send a Republican to Congress. Ideological gatekeeping in conservative districts is therefore both structural and internalized by potential Republican candidates who are women. Though high-profile moderate Republican women exist,[19] one potential way to neutralize perceptions that they are not sufficiently conservative is to be especially outspoken on bread-and-butter conservative issues like gun rights, with examples such as Marjorie Taylor Greene and Lauren Boebert (see also Wineinger 2022).

The effect of the nomination process has likely become more important in recent years, with primaries becoming more commonly being contested (Cowburn 2022b, 2024), potentially serving as a formidable barrier to women's descriptive representation in Congress. At the same time, congressional districts have become increasingly safe for one party (Cook Political Report 2017), making primary elections more important in determining who reaches Capitol Hill. These dynamic conditions reflect the need to revisit established empirical findings about congressional nominations in the current era of primary elections. That congressional elections have been consistently close at the national level in the twenty-first century incentivizes primary voters to put increased weight on concerns about 'electability' during the selection process. As indicated here and in previous research (Bateson 2020), this emphasis is unlikely to help women.

The role of media coverage in driving (potential) candidates' perceptions about primary voters also deserves closer scrutiny. Conditional on running, Republican women were no less likely to win primaries in safe general election districts for the party. Yet, these are the districts where Republican women are least likely to run. Republican women's decision not to run in these districts is likely due to a lack of institutional support from policy demanders (Och 2020), a

[19] Including Senators Susan Collins of Maine, Lisa Murkowski of Alaska, and Representative Ann Wagner of Missouri.

perceived lack of fit with their party (Thomsen 2017), and a widespread media narrative that primary voters are more extreme than voters who participate in November elections (see e.g., Schumer 2014). Correcting this widely-held media narrative about the ideological position of primary voters may therefore offer one avenue to help increase the descriptive representation of women in the Republican Party.

Gender issues arising from primaries are not easily resolved. It is comparatively difficult for U.S. parties to formally implement pro-women policies during the candidate selection phase of the election cycle in ways that have improved women's representation in other democracies (O'Brien and Rickne 2016; Taflaga and Beauregard 2020; Xydias 2007). Though parties hold powers that help them control nominations behind the scenes (Hassell 2018), implementing formal reforms such as all-women shortlists, quotas, or a 'zipper system' mandating alternating positions for men and women in list systems, are simply not available options for U.S. parties who wish to increase the number of women in Congress. Indeed, the relative openness and inclusivity of the candidate nomination system (Cowburn and Kerr 2023) appears one reason the U.S. continues to lag behind comparable advanced democracies in the descriptive representation of women in the legislature. Yet, the mechanisms through which they do so are distinct in the Democratic and Republican parties.

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Supplementary Information

Below we present the descriptive statistics of our key variables as well as a series of robustness checks to demonstrate that our findings are not an artifact of our research design.

Descriptive Statistics

In Table A.1, we present an overview of our descriptive data, including the total number of observations, their mean, standard deviation, minimum and maximum values, and skewness and kurtosis.

Table A.1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max	Skew.	Kurt.
Woman Running	3,330	.454	.498	0	1	.183	1.034
Woman Winning	3,330	.241	.428	0	1	1.208	2.46
Republican	3,330	.518	.5	0	1	-.071	1.005
Relative PVI	3,330	2	14.107	-38	44	.207	2.734
Incumbent Primary	3,330	.384	.487	0	1	.475	1.226
Open-Seat Primary	3,330	.171	.377	0	1	1.743	4.039
Quality Woman	3,330	.21	.408	0	1	1.422	3.023
% Women State Leg	3,330	26.439	7.368	8.8	58.7	.423	3.808
District White %	3,330	.676	.211	.024	.97	-.872	2.973
Median Income ($10,000s)	3,330	5.869	1.603	2.846	13.997	1.233	4.985
Total Spending ($10,000s)	3,330	27.798	69.484	0	1180.388	7.992	94.034
Median Age	3,330	37.922	3.295	26	55.6	.221	4.04
Urban Density	3,330	3.393	1.627	1	6	-.089	1.793
District Area	3,330	17633	54587	10.25	572000	7.768	75.073
Senate	3,330	.111	.314	0	1	2.48	7.149
Number of Candidates	3,330	3.245	1.956	2	19	2.694	13.187

Extensions

We are cognizant that partisan and district characteristics are far from the only factors shaping women's success in primary elections and so present two further extensions of our main analyses. In both cases, the variables used in these extensions are included in the original model as control variables, and, indeed, the empirical model shown here is the same as that presented in the main manuscript with only our substantive focus and interpretation shifting.

Variation Based on Primary Type

The presence of an incumbent has been shown to be *the* key factor shaping candidate emergence and likely winner in congressional primaries (Boatright 2014). The type of primary election—incumbent, open-seat, or challenger—therefore also shapes women's likelihood of running for

Congress. Women are less likely to run against incumbents (Shames 2018a), who have strong name recognition, financial resources, and party support, and who are disproportionately men (Schwindt-Bayer 2005). Incumbent primaries typically discourage all challengers, including women, due to the high likelihood of defeat and the substantial barriers to entry (Boatright 2013). Given the gendered makeup of Congress and the incumbency advantage in primaries, we expect that incumbent primaries will be particularly challenging terrain for women in both parties.

Open-seat primaries are widely regarded as the most favorable context for women candidates. With no incumbent in the race, these elections provide a level playing field, reducing the structural advantages that typically benefit male candidates (Shames 2018a). Open-seat races often have more diverse candidate pools, providing opportunities for female candidates, though in often-crowded fields. Though women are more likely to emerge as candidates in open-seat primaries and have long been shown to perform as well as their male counterparts in these contests (Burrell 1992), quality women remain disadvantaged in terms of winning these contests (Barnes, Branton, and Cassese 2017).

Challenger primaries, where candidates face a sitting member of Congress from the opposing party in the general election, offer mixed results for women. While these races theoretically provide opportunities for women, female candidates are less likely to be recruited for these contests that the party can win in the general election due to the higher perceived risks and high costs of running against incumbents in the general election (Sanbonmatsu 2006b). Conversely, in districts that the party has no hope of winning in the general election, the lack of party coordination, gatekeeping, or required financial support may make these some of the easiest primary contests for women to earn the nomination. In some cases, the party may even decide it is beneficial to run women to send a signal about gender beyond the district in question (see e.g., Och 2018). We therefore expect that:

H4$_a$: Women in both parties are most likely to run in open-seat primaries, and least likely to run in incumbent primaries

H4$_b$: Women in both parties are most successfully at winning open-seat primaries, and least successful at winning incumbent primaries

We include *primary type* as a factor variable (**H4**). Our models use the base category of challenger primary (where the incumbent is running in the alternative party's primary), and report coefficients for incumbent primary (incumbent running in that party's primary) and open-seat primary (incumbent not running) in our models.

***Table A.2**: Heckman Two-Stage Selection Results*

	Running (a hypotheses)		**Winning (b hypotheses)**	
	Democratic	Republican	Democratic	Republican
Primary Type: Incumbent Primary **(H4)**	-0.207*	0.031	-0.267***	-0.172**
	(0.121)	(0.110)	(0.062)	(0.068)
Primary Type: Open-Seat Primary **(H4)**	0.189*	0.327***	-0.096*	-0.022
	(0.110)	(0.108)	(0.049)	(0.091)
Observations	1,606	1,724	1,606	1,724
State FE	✓	✓	✓	✓
Year FE	✓	✓	✓	✓

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
(Primary Type Reference Category: Challenger Primary)
Model shown is a two-stage selection model performed by party with state and year fixed effects. Control variables not shown, full coefficients provided in the supplementary material.

We present our results for this extension in Table A.2. In terms of women running in different types of primary (**H4$_a$**), we see that Democratic women ran slightly less often against incumbents and somewhat more often in open-seat primaries. In both cases, these relationships are only marginally (both $p<0.1$) significant, meaning caution should be taken when interpreting these results and that we are not able to say anything definitive about Democratic women running under different types of primary. Republican women ran in open-seat primaries more often than in other types of primary. One potential explanation for this association is that Republican women are strategic in their decision of where and when to run; aware that they will have a difficult task deposing an (usually male) incumbent and perceiving they have more chance of being elected to Congress when no incumbent from either party is present.[20] We present some further descriptive statistics in the supplementary material demonstrating that women win incumbent primaries less

[20] Open-seat contests attract more candidates, hence our inclusion of the number of candidates as a control.

frequently than men, and that women are less likely to win incumbent primaries compared to other types of primary.

If female candidates are making such calculations, they would appear to be well founded, with women especially unlikely to win incumbent primary contests in either party (**H4$_b$**). Male incumbents remain a key obstacle to women becoming the candidate in many districts. Despite their higher rates of entry, women are not specifically able to win open-seat primaries, with Democratic women potentially ($p<0.1$) even less well able to win these contests than challenger primaries (the reference category). Challenger primaries are therefore nomination contests women are most able to win, these districts offer the most difficult general election terrain and are the districts from which candidates are least likely to advance to Congress.

Temporally extending previous findings from Political Parity (Shames 2017b), we identify that both Democratic and Republican women run more frequently in open-seat primaries. Yet unlike this previous study, we find that women are no more likely to win open-seat primaries when they run, underscoring the importance of demand side factors to understand women's underrepresentation.

Our results also highlight one of the major barriers to the increased descriptive representation of women in Congress: the (male) incumbency advantage (Schwindt-Bayer 2005). Women have markedly less success when they run in incumbent primary contests compared to other types of primary election, or compared to their male counterparts.[21] One potential remedy to this problem is to focus on increasing rates of representation at the state level, which was positively associated with Democratic women winning primaries in incumbent, open-seat, and challenger primaries. Among Republicans, this pattern held in challenger primaries only.

Variation Based on % Women in the State Legislature

The gender composition of the candidate pool is another important factor for women's descriptive representation, where the proportion of women in the pool of potential candidates significantly

[21] We present a further extension below l indicating that male candidates are particularly likely to win incumbent primaries.

affects the number of women who run for and win office (Crowder-Meyer and Lauderdale 2014). A larger pool of female potential candidates increases the likelihood of women running in primaries and succeeding, highlighting the importance of addressing the gendered pipeline to political power (Thomsen and King 2020). Consequently, jurisdictions with a history of electing women are perceived as more hospitable to female candidacies, implicating a "culture of representation" (Ladam, Harden, and Windett 2018; Pyeatt and Yanus 2021). States with more women in the workforce, especially in legal fields and law school, have more female representatives in their state legislatures (Norrander and Wilcox 2008; Rule 1990), as do states with more progressive gender role attitudes (Arceneaux 2001). These states are also likely to be the places where the parties are most likely to encourage women to run for office, and to provide them with support when they do (Sanbonmatsu 2006b).

The number of female legislators in state government has shown to be closely associated with representation in Congress, presenting a particular challenge for Republicans who disproportionately advance to Congress from states with fewer female legislators (Elder 2018). In addition, there is a clear asymmetry in terms of candidate supply, with more Democratic women in state legislatures and evidence that women in the two parties have distinct career paths (Erler 2018). State legislatures with more Republican women are also the states where women are least likely to run for higher office (Erler 2018), contributing to an asymmetric pipeline of female candidates and meaning that Republican women are both more likely to run in and win primaries in unwinnable districts. Conversely, Democratic women have a greater likelihood of winning a primary in a district from which they might advance to Congress.

$H5_a$: Women are more likely to run in primaries in states with a higher percentage of women in the state legislature.

$H5_b$: Women are more successful at winning primaries in states with a higher percentage of women in the state legislature.

More women in a state legislature might align with women running and winning congressional primaries in two distinct ways: through a 'culture of representation', or through a

larger pipeline of 'quality' candidates (Thomsen and King 2020). Under the first mechanism, voters may perceive women in legislative positions as 'normal' and be more positively disposed to vote for female candidates for Congress, both encouraging more women to run and increasing their chances of becoming the nominee when they do. In the second mechanism, women serving in the state legislature may decide they are suitably skilled and experienced to run for higher office, creating a pipeline of viable candidates willing to run and who have the required abilities to win a primary.

To account for the relationship between the federal and state level, we analyze the likelihood that a woman runs and wins a primary based on the percentage of *women in the state legislature* (**H5**), using data from the Center for Women in Politics (CAWP) (Women in State Legislative Elections 2022).

***Table A.3**: Heckman Two-Stage Selection Results*

	Running (a hypotheses)		**Winning (b hypotheses)**	
	Democratic	Republican	Democratic	Republican
% Women State Leg **(H5)**	0.000	0.000	-0.004	0.007
	(0.012)	(0.012)	(0.005)	(0.007)
Observations	1,606	1,724	1,606	1,724
State FE	✓	✓	✓	✓
Year FE	✓	✓	✓	✓

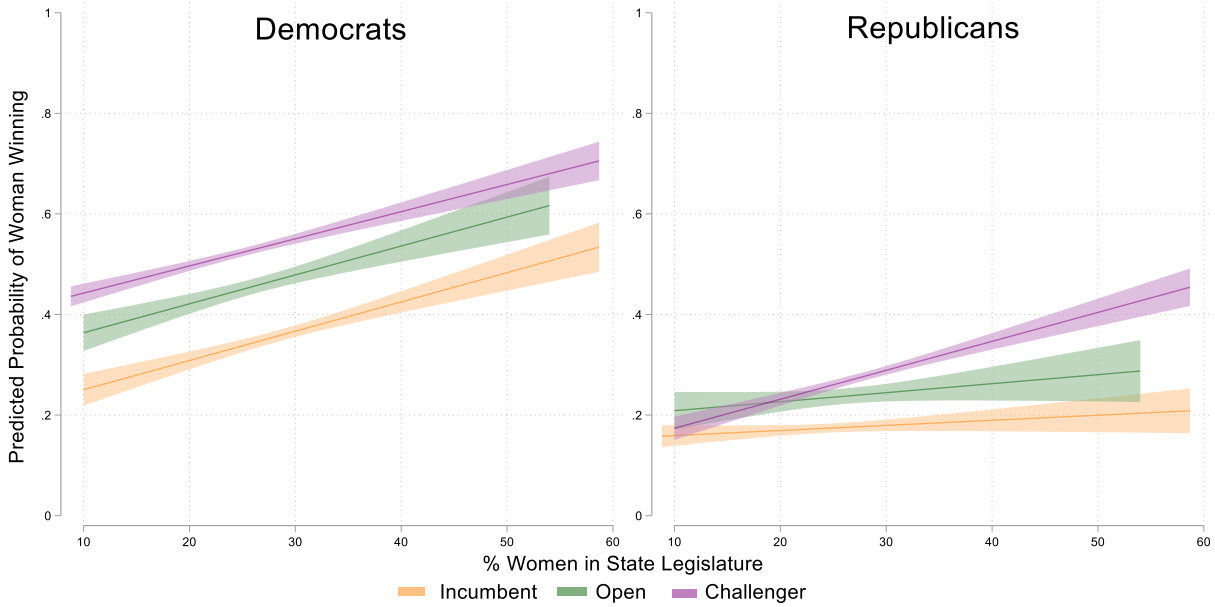
Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Model shown is a two-stage selection model performed by party with state and year fixed effects. Control variables not shown, full coefficients provided in the supplementary material.

Table A.3 indicates no relationship at the aggregate level between women running in ($\mathbf{H5_a}$) or winning ($\mathbf{H5_b}$) primaries and the percentage of women in the state legislature in either party. We examine this finding at a more granular level below. Though on aggregate we report null findings for the percentage of women in the state legislature at both stages of our main model in Table A.3, we also recognize the potential for heterogeneity based on the type of primary. Rather than presenting an interacted model,[22] we instead show the predicted probabilities conditional on primary type in Figure A.3 to reveal relationships between the descriptive representation of women at the state and federal level in some primaries.

[22] See robustness checks below for interacted model coefficients. Predicted probabilities in Figure A.3 are based on the non-interacted model shown in Table A.3.

Most obviously, Figure A.3 shows that Democratic women are more able to win all types of primaries in states with a higher percentage of women in the legislature ($\mathbf{H5_b}$). Each additional ten percentage point increase in representation at the state level is associated with an almost five percent increased probability that a Democratic woman will win a primary. Among Republicans, a similar relationship is present in challenger primaries *only*, with no association in open-seat or incumbent primaries. We run a further model with the addition of interaction terms between primary type and the percentage of women in the state legislature in the robustness checks below; these results suggest that the relationships observed here are primarily connected to variation in the rates of women running ($\mathbf{H5_a}$). The clear partisan asymmetry is once again visible here, with higher predicted probabilities of Democratic women winning across all levels of state representation.

Figure A.3: Women Winning Different Types of Primaries by State Legislature Gender



Robustness Checks

In the following we present a series of robustness checks to our main analysis to demonstrate that our results are not an artifact of our specification choices.

Combined Two-Party Model

In Table A.4 we present the full results of our combined model including all control variables. This model indicates the substantive differences between the parties meaning we run all of our analyses separately by party.

***Table A.4**: Combined Model*

	Running (1)	**Winning (2)**
Republican	-0.672***	-0.258***
	(0.049)	(0.090)
District PVI +/-	0.001	0.000
	(0.003)	(0.001)
District PVI +/-^{2}	-0.000	0.000**
	(0.000)	(0.000)
Primary Type: Incumbent Primary	-0.134*	-0.260***
	(0.076)	(0.047)
Primary Type: Open-Seat Primary	0.193***	-0.083**
	(0.074)	(0.041)
% Women State Leg	0.002	0.002
	(0.009)	(0.004)
Quality Woman	-	0.184***
		(0.026)
District White %	-0.287	-0.002
	(0.218)	(0.121)
Median Income ($10,000s)	0.025	0.013
	(0.021)	(0.011)
Total Spending ($10,000s)	0.000	-
	(0.000)	
Median Age	-0.023*	-0.004
	(0.012)	(0.007)
Urban Density	-0.002	-0.001
	(0.016)	(0.008)
District Area	0.000	0.000
	(0.000)	(0.000)
Senate	-0.463***	0.056
	(0.110)	(0.083)
Number of Candidates	0.300***	-0.044
	(0.038)	(0.040)
Number of Candidates^2	-0.012***	0.002
	(0.003)	(0.002)
Constant	-0.202	0.584*
	(0.456)	(0.313)
Observations	3,330	3,330
State FE	✓	✓
Year FE	✓	✓

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
(Primary Type Reference Category: Challenger Primary)

Removal of Fixed Effects

In Table A.5 we present the results without state or year fixed effects demonstrating that the relationships that we observe are robust to the exclusion of these terms.

***Table A.5**: No State or Year Fixed Effects*

	Running (1)		**Winning (2)**	
	Democratic	Republican	Democratic	Republican
District PVI +/-	-0.001	-0.004	-0.003	-0.000
	(0.004)	(0.004)	(0.002)	(0.003)
District PVI +/-^{2}	0.000	-0.000	0.000***	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Primary Type: Incumbent Primary	-0.239**	-0.103	-0.242***	-0.067
	(0.108)	(0.100)	(0.068)	(0.096)
Primary Type: Open Primary	0.209**	0.253**	-0.145***	-0.144
	(0.103)	(0.101)	(0.054)	(0.136)
% Women State Leg	0.021***	0.017***	0.004	-0.000
	(0.005)	(0.005)	(0.004)	(0.009)
Quality Woman	-	-	0.161***	0.212***
			(0.034)	(0.040)
District White %	-0.533**	0.097	0.074	0.026
	(0.235)	(0.227)	(0.141)	(0.162)
Median Income ($10,000s)	0.051**	-0.015	-0.008	-0.011
	(0.023)	(0.023)	(0.014)	(0.017)
Total Spending ($10,000s)	0.001	-0.001	-	-
	(0.001)	(0.001)		
Median Age	0.000	-0.015	0.002	0.010
	(0.013)	(0.012)	(0.006)	(0.012)
Urban Density	0.022	-0.023	0.007	-0.008
	(0.021)	(0.020)	(0.010)	(0.018)
District Area	-0.000	0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Senate	-0.346***	-0.389***	0.152*	0.304
	(0.128)	(0.124)	(0.078)	(0.251)
Number of Candidates	0.385***	0.208***	-0.080	-0.149
	(0.055)	(0.049)	(0.067)	(0.117)
Number of Candidates^2	-0.019***	-0.006*	0.002	0.007
	(0.005)	(0.004)	(0.004)	(0.004)
Constant	-1.292***	-0.702*	0.738	0.940
	(0.455)	(0.427)	(0.502)	(1.044)
Observations	1,606	1,724	1,606	1,724

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
(Primary Type Reference Category: Challenger Primary)

Addition of Further Fixed Effects

In Table A.6 we present the results with district fixed effects included in the first stage. Even with this additional layer of fixed effects our finding that Republicans are less likely to run in less conservative districts holds.

***Table A.6**: Addition of First-Stage District Fixed Effects*[23]

	Running (1)		**Winning (2)**	
	Democratic	Republican	Democratic	Republican
District PVI +/-	0.003	-0.015***	-0.004	-0.004
	(0.006)	(0.005)	(0.003)	(0.005)
District PVI +/-^{2}	-0.000	-0.000	0.000***	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Primary Type: Incumbent Primary	-0.207*	0.031	-0.267***	-0.172**
	(0.121)	(0.110)	(0.062)	(0.068)
Primary Type: Open-Seat Primary	0.189*	0.327***	-0.096*	-0.022
	(0.110)	(0.108)	(0.049)	(0.091)
% Women State Leg	0.000	0.000	-0.004	0.007
	(0.012)	(0.012)	(0.005)	(0.007)
Quality Woman	-	-	0.153***	0.211***
			(0.034)	(0.039)
District White %	-0.517	0.663*	-0.113	0.023
	(0.391)	(0.396)	(0.191)	(0.274)
Median Income ($10,000s)	0.048	-0.015	0.021	-0.004
	(0.030)	(0.031)	(0.014)	(0.018)
Total Spending ($10,000s)	0.001	-0.001	-	-
	(0.001)	(0.001)		
Median Age	-0.007	-0.041**	-0.000	-0.010
	(0.017)	(0.017)	(0.008)	(0.014)
Urban Density	0.018	-0.029	0.003	-0.010
	(0.023)	(0.023)	(0.010)	(0.014)
District Area	0.000	-0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Senate	-0.529***	-0.474***	0.118	0.105
	(0.172)	(0.157)	(0.092)	(0.161)
Number of Candidates	0.398***	0.247***	-0.020	-0.061
	(0.060)	(0.053)	(0.047)	(0.064)
Number of Candidates^2	-0.017***	-0.009**	-0.000	0.003
	(0.005)	(0.004)	(0.003)	(0.003)
Constant	-0.974	-0.321	0.520	0.440
	(0.656)	(0.659)	(0.412)	(0.547)
Observations	1,606	1,724	1,606	1,724
District FE	✓	✓		
State FE			✓	✓
Year FE	✓	✓	✓	✓

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
(Primary Type Reference Category: Challenger Primary)

[23] Model fails to converge if district fixed effects are included at the second stage.

In Table A.7 we only include year fixed effects, again our main results hold.

***Table A.7**: Year Fixed Effects Only*

	Running (1)		**Winning (2)**	
	Democratic	Republican	Democratic	Republican
District PVI +/-	0.006	-0.008*	-0.001	-0.002
	(0.004)	(0.004)	(0.002)	(0.004)
District PVI +/-^{2}	-0.000	-0.000*	0.000***	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Primary Type: Incumbent Primary	-0.320***	-0.040	-0.324***	-0.081
	(0.110)	(0.103)	(0.073)	(0.070)
Primary Type: Open Primary	0.215**	0.312***	-0.117**	-0.091
	(0.104)	(0.103)	(0.052)	(0.117)
% Women State Leg	0.008	0.006	0.004	0.001
	(0.006)	(0.005)	(0.003)	(0.004)
Quality Woman	-	-	0.175***	0.219***
			(0.034)	(0.040)
District White %	-0.465*	0.192	-0.003	0.073
	(0.239)	(0.233)	(0.129)	(0.159)
Median Income ($10,000s)	0.031	-0.035	-0.000	-0.021
	(0.023)	(0.023)	(0.011)	(0.020)
Total Spending ($10,000s)	0.001	-0.001	-	-
	(0.001)	(0.001)		
Median Age	-0.010	-0.024*	-0.001	0.005
	(0.013)	(0.012)	(0.006)	(0.012)
Urban Density	0.030	-0.023	0.012	-0.012
	(0.021)	(0.020)	(0.010)	(0.014)
District Area	-0.000	0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Senate	-0.320**	-0.399***	0.107	0.209
	(0.129)	(0.125)	(0.072)	(0.183)
Number of Candidates	0.364***	0.213***	-0.020	-0.106
	(0.057)	(0.049)	(0.057)	(0.083)
Number of Candidates^2	-0.018***	-0.007*	-0.001	0.005
	(0.005)	(0.004)	(0.003)	(0.003)
Constant	-0.716	-0.384	0.427	0.602
	(0.478)	(0.456)	(0.398)	(0.668)
Observations	1,606	1,724	1,606	1,724
Year FE	✓	✓	✓	✓

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
(Primary Type Reference Category: Challenger Primary)

House Primaries Only

In Table A.8 we present the results for House primaries only given the substantive differences between House and Senate races. When we repeat our analysis on this subset, our findings hold.

***Table A.8**: House Primaries Only*

	Running (1)		**Winning (2)**	
	Democratic	Republican	Democratic	Republican
District PVI +/-	0.005	-0.016***	-0.001	-0.002
	(0.006)	(0.006)	(0.003)	(0.004)
District PVI +/-^{2}	0.000	-0.000	0.000***	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Primary Type: Incumbent Primary	-0.307**	0.036	-0.362***	-0.191***
	(0.134)	(0.120)	(0.069)	(0.069)
Primary Type: Open-Seat Primary	0.118	0.203*	-0.110**	-0.063
	(0.120)	(0.121)	(0.051)	(0.068)
% Women State Leg	-0.005	-0.001	-0.005	0.006
	(0.014)	(0.014)	(0.006)	(0.007)
Quality Woman	-	-	0.132***	0.195***
			(0.036)	(0.040)
District White %	-0.322	0.707*	-0.053	0.011
	(0.408)	(0.421)	(0.192)	(0.272)
Median Income ($10,000s)	0.039	-0.031	0.023	-0.003
	(0.032)	(0.033)	(0.014)	(0.019)
Total Spending ($10,000s)	0.002*	-0.000	-	-
	(0.001)	(0.001)		
Median Age	-0.008	-0.039**	-0.002	-0.006
	(0.018)	(0.017)	(0.008)	(0.012)
Urban Density	0.012	-0.027	0.002	-0.009
	(0.023)	(0.023)	(0.011)	(0.013)
District Area	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Number of Candidates	0.364***	0.303***	-0.033	-0.077
	(0.139)	(0.063)	(0.044)	(0.067)
Number of Candidates^2	-0.009	-0.009*	0.000	0.004
	(0.018)	(0.005)	(0.003)	(0.003)
Constant	-0.968	-0.354	0.561	0.556
	(0.707)	(0.683)	(0.401)	(0.501)
Observations	1,436	1,525	1,436	1,525
State FE	✓	✓	✓	✓
Year FE	✓	✓	✓	✓

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
(Primary Type Reference Category: Challenger Primary)

Interaction Terms

In Table A.9 we present the coefficients for the interaction terms between the percentage of women in the state legislature and the type of primary. This interacted model provides an additional robustness check to the models shown visually in Figure 4 of the manuscript.

***Table A.9**: Interaction Terms from Extended Heckman Model*

	Running (1)		**Winning (2)**	
	Democratic	Republican	Democratic	Republican
% Women State Leg	0.014*	0.017**	0.001	0.000
	(0.007)	(0.008)	(0.004)	(0.007)
% Women State Leg # Incumbent	-0.022**	-0.028***	0.004	-0.001
	(0.010)	(0.011)	(0.006)	(0.012)
% Women State Leg # Open	0.017	0.004	0.010*	-0.000
	(0.015)	(0.013)	(0.006)	(0.006)

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Baseline Category = Challenger Primary
Model includes Year fixed effects only

No Campaign Finance Control

In Table A.10, we drop the campaign finance control. Because this is the only control we include in only the first stage of the model it has the potential to bias our results. We see that when we exclude this control all of our main findings are completely unchanged.

***Table A.10**: Exclusion of Campaign Finance Control*

	Running (1)		**Winning (2)**	
	Democratic	Republican	Democratic	Republican
District PVI +/-	0.004	-0.015***	-0.004	0.000
	(0.006)	(0.005)	(0.003)	(0.005)
District PVI +/-^{2}	-0.000	-0.000	0.000***	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Primary Type: Incumbent Primary	-0.204*	0.029	-0.272***	-0.171***
	(0.121)	(0.110)	(0.063)	(0.066)
Primary Type: Open Primary	0.199*	0.306***	-0.092*	-0.099
	(0.110)	(0.107)	(0.050)	(0.095)
% Women State Leg	0.000	0.000	-0.004	0.007
	(0.012)	(0.012)	(0.005)	(0.006)
Quality Woman	-	-	0.152***	0.211***
			(0.035)	(0.039)
District White %	-0.518	0.633	-0.126	-0.149
	(0.390)	(0.395)	(0.195)	(0.282)
Median Income ($10,000s)	0.049	-0.017	0.022	0.002
	(0.030)	(0.031)	(0.014)	(0.018)
Median Age	-0.007	-0.040**	-0.001	0.001
	(0.017)	(0.017)	(0.008)	(0.014)
Urban Density	0.018	-0.028	0.003	-0.003
	(0.023)	(0.023)	(0.011)	(0.014)
District Area	0.000	-0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Senate	-0.470***	-0.524***	0.110	0.250
	(0.165)	(0.152)	(0.094)	(0.176)
Number of Candidates	0.403***	0.243***	-0.011	-0.124*
	(0.060)	(0.053)	(0.049)	(0.070)
Number of Candidates^2	-0.017***	-0.008**	-0.001	0.006**
	(0.005)	(0.004)	(0.003)	(0.003)
Constant	-0.976	-0.336	0.464	0.871
	(0.656)	(0.658)	(0.423)	(0.583)
Observations	1,606	1,724	1,606	1,724
State FE	✓	✓	✓	✓
Year FE	✓	✓	✓	✓

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
(Primary Type Reference Category: Challenger Primary)

Exclusion of Top-Two Primaries

Because Top-Two primaries in California and Washington have a fundamentally different logic to partisan primary competitions elsewhere, we ensure that our results are robust to their exclusion by repeating our main analyses without these contests. The results are shown in Table A.11 and align with those in the manuscript.

***Table A.11**: Removal of Top-Two Primaries*

	Running (1)		**Winning (2)**	
	Democratic	Republican	Democratic	Republican
District PVI +/-	0.007	-0.016***	-0.003	-0.004
	(0.006)	(0.006)	(0.003)	(0.005)
District PVI +/-^{2}	-0.000	-0.000	0.000***	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Primary Type: Incumbent Primary	-0.201	-0.003	-0.308***	-0.194**
	(0.131)	(0.117)	(0.067)	(0.076)
Primary Type: Open-Seat Primary	0.182	0.390***	-0.092*	0.062
	(0.115)	(0.114)	(0.051)	(0.110)
% Women State Leg	-0.012	-0.003	-0.007	0.006
	(0.013)	(0.013)	(0.006)	(0.007)
Quality Woman	-	-	0.121***	0.207***
			(0.037)	(0.041)
District White %	-0.329	0.743*	-0.109	0.051
	(0.443)	(0.431)	(0.215)	(0.312)
Median Income ($10,000s)	0.073**	-0.002	0.011	-0.004
	(0.037)	(0.036)	(0.017)	(0.021)
Total Spending ($10,000s)	0.001	-0.001	-	-
	(0.001)	(0.001)		
Median Age	-0.010	-0.052***	-0.003	-0.026
	(0.019)	(0.018)	(0.009)	(0.017)
Urban Density	-0.004	-0.038	-0.009	-0.031*
	(0.026)	(0.025)	(0.012)	(0.018)
District Area	0.000	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Senate	-0.553***	-0.485***	0.085	0.071
	(0.175)	(0.159)	(0.097)	(0.170)
Number of Candidates	0.375***	0.248***	-0.012	-0.037
	(0.063)	(0.056)	(0.046)	(0.066)
Number of Candidates^2	-0.016***	-0.009**	-0.001	0.002
	(0.005)	(0.004)	(0.003)	(0.003)
Constant	-0.805	0.043	0.702	0.773
	(0.755)	(0.723)	(0.431)	(0.539)
Observations	1,412	1,560	1,412	1,560
State FE	✓	✓	✓	✓
Year FE	✓	✓	✓	✓

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
(Primary Type Reference Category: Challenger Primary)

Thresholds

Because many primary candidates are long shots with no chance of winning the district, we repeat our analyses with only those candidates who have a realistic chance of winning the nomination. Boatright (2013) establishes the electoral threshold of 15% for a candidate in a primary to be considered viable. In Table A.12, we restrict inclusion into our model to those candidates who meet this criteria.

***Table A.12**: Electoral Threshold: 15% Vote Share to be Considered "Running"*

	Running (1)		**Winning (2)**	
	Democratic	Republican	Democratic	Republican
District PVI +/-	-0.042***	-0.005	-0.003	-0.003**
	(0.010)	(0.007)	(0.002)	(0.001)
District PVI +/-^{2}	0.001***	-0.000	0.000***	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Primary Type: Incumbent Primary	-0.837***	-0.884***	-0.155***	-0.055
	(0.184)	(0.145)	(0.050)	(0.039)
Primary Type: Open-Seat Primary	-0.107	0.146	-0.065*	-0.002
	(0.204)	(0.179)	(0.035)	(0.027)
% Women State Leg	0.036**	0.004	-0.004	0.004
	(0.017)	(0.016)	(0.004)	(0.003)
Quality Woman	-	-	0.413***	0.425***
			(0.028)	(0.022)
District White %	-1.083**	-0.092	-0.053	-0.016
	(0.544)	(0.567)	(0.136)	(0.097)
Median Income ($10,000s)	0.104**	-0.134***	0.016	-0.009
	(0.043)	(0.041)	(0.010)	(0.009)
Total Spending ($10,000s)	0.006***	0.001	-	-
	(0.002)	(0.001)		
Median Age	-0.000	-0.017	0.001	-0.003
	(0.027)	(0.024)	(0.006)	(0.004)
Urban Density	-0.034	0.038	0.008	-0.005
	(0.032)	(0.032)	(0.008)	(0.006)
District Area	0.000	0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Senate	-0.827***	-0.730***	0.031	0.020
	(0.236)	(0.193)	(0.058)	(0.042)
Number of Candidates	0.100	-0.014	0.018	-0.025*
	(0.078)	(0.068)	(0.021)	(0.013)
Number of Candidates^2	-0.006	-0.001	-0.002	0.001
	(0.005)	(0.005)	(0.002)	(0.001)
Constant	0.778	3.817***	0.046	0.184
	(0.966)	(0.977)	(0.228)	(0.165)
Observations	1,606	1,724	1,606	1,724
State FE	✓	✓	✓	✓
Year FE	✓	✓	✓	✓

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
(Primary Type Reference Category: Challenger Primary)

Inclusion of a Time Trend

To account for the possibility of a linear increase in the number of women in Congress and our results merely reflecting that trend, we repeat our models with a linear time trend rather than time fixed effects as the temporal control. We present our results in Table A.10.

***Table A.10**: Time Trend Rather Than Year FEs*

	Running (1)		**Winning (2)**	
	Democratic	Republican	Democratic	Republican
District PVI +/-	-0.040***	-0.005	-0.004**	-0.003*
	(0.010)	(0.007)	(0.002)	(0.001)
District PVI +/-^{2}	0.001***	-0.000	0.000***	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Primary Type: Incumbent Primary	-0.836***	-0.820***	-0.151***	-0.094**
	(0.181)	(0.142)	(0.050)	(0.041)
Primary Type: Open-Seat Primary	-0.081	0.184	-0.069**	-0.008
	(0.203)	(0.176)	(0.035)	(0.028)
% Women State Leg	0.022	-0.021	0.003	0.005
	(0.016)	(0.014)	(0.004)	(0.003)
Time (Trend)	-0.016	0.017	0.013***	0.010***
	(0.015)	(0.014)	(0.004)	(0.003)
Observations	1,606	1,724	1,606	1,724
State FE	✓	✓	✓	✓

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
(Primary Type Reference Category: Challenger Primary)

Exclude Incumbent Races

Given that incumbent primaries are fundamentally different from other primary contests on a number of dimensions, we repeat our main analyses excluding these primaries. In our main models in our manuscript we control for these differences using the primary type variable, but our main results hold even when restricted to challenger and open-seat primaries, as shown in Table A.11.

***Table A.11**: No Incumbent Races*

	Running (1)		**Winning (2)**	
	Democratic	Republican	Democratic	Republican
District PVI +/-	0.007	-0.019***	0.000	0.001
	(0.008)	(0.007)	(0.003)	(0.005)
District PVI +/-^{2}	-0.000	-0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Primary Type: Open-Seat Primary	0.189	0.287**	-0.072	-0.100
	(0.118)	(0.116)	(0.049)	(0.077)
% Women State Leg	-0.017	0.009	-0.007	0.005
	(0.017)	(0.017)	(0.007)	(0.007)
Quality Woman			-0.081*	0.050
			(0.041)	(0.050)
District White %	0.257	1.361***	-0.096	-0.062
	(0.606)	(0.477)	(0.256)	(0.352)
Median Income ($10,000s)	0.059	-0.032	-0.007	-0.007
	(0.046)	(0.040)	(0.018)	(0.022)
Total Spending ($10,000s)	0.001	-0.001		
	(0.001)	(0.001)		
Median Age	-0.011	-0.033	0.003	-0.005
	(0.024)	(0.021)	(0.011)	(0.012)
Urban Density	0.025	-0.065**	0.008	0.012
	(0.036)	(0.028)	(0.014)	(0.018)
District Area	0.000	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Senate	-0.773***	-0.603***	0.103	0.281
	(0.224)	(0.202)	(0.114)	(0.174)
Number of Candidates	0.448***	0.273***	-0.020	-0.118**
	(0.074)	(0.065)	(0.044)	(0.058)
Number of Candidates^2	-0.019***	-0.009**	-0.001	0.005*
	(0.006)	(0.005)	(0.003)	(0.003)
Constant	-1.439	-0.717	0.708	0.860
	(0.898)	(0.880)	(0.470)	(0.591)
Observations	1,004	1,046	1,004	1,046
State FE	✓	✓	✓	✓
Year FE	✓	✓	✓	✓

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
(Primary Type Reference Category: Challenger Primary)

Men As Dependent Variable

As part of the review process, one reviewer requested that we extend our results for incumbent primaries to male candidates. We therefore replicate our full results as closely as possible here, with the dependent variable of men winning the primary. Unfortunately, because there are no primaries in our dataset that are contested and do not feature at least one male candidate, we cannot replicate our Heckman models with men running as the selection variable and men winning as the outcome variable. We therefore instead present two cross-sectional ordinary least squares (OLS) regressions with the dependent variable being whether a man wins the primary in Table A.12. This approach is statistically valid because we simply skip the selection stage where no primaries would be selected out anyway and perform the analysis.

Both models in Table A.12 estimate panel data regression models, but with different specifications: one using fixed effects (FE) and the other using random effects (RE). The fixed-effects model shown in columns two and three estimates within-district variation by removing time-invariant unobserved heterogeneity, thereby controlling for all unobserved characteristics that do not change over time. The random effects model shown in columns four and five assumes that the entity-specific effects are random and uncorrelated with the regressors, modelling both within and between district variation, keeping time-invariant variables (e.g., state) in the estimation. In both models, the coefficient for incumbent primary is positive and statistically significant, providing further empirical support to our claim that the incumbency advantage disproportionately benefits men as a group.

In the extension based on primary type **(H4)**, we argue that incumbents serve as a barrier for women entering Congress. Of course, incumbents present a barrier to any other candidates entering Congress, given their particularly high rate of reelection. In Tables A.2, A.3, and A.4, we therefore focus on differential effects on women across different types of primary and potential effects on men. In Table A.13, we demonstrate that women still run in incumbent congressional primaries 37.89% of the time. Though women run at lower rates in incumbent primaries than in challenger or open-seat contests—in part because more candidates run in these other types of primary, variation that we control for in our empirical models—they are far less frequently nominated as the candidate via this mechanism, as shown in Table A.14. Overall, women win incumbent primaries to become the general election candidate just 18.75% of the time, compared to 28.03% in challenger primaries, and 27.40% in open-seat contests. The only type of nomination contest that women win at similarly low rates to incumbent contests is when there is no primary, meaning that the local party simply picks the candidate, or only one candidate runs. In these nominations,

women are selected as the general election candidate 19.74% of the time. These data demonstrate that, though male incumbents represent a barrier for other male candidates entering Congress at the individual level, they also disproportionately prevent women as a group from entering Congress.

***Table A.12**: Male Winner as DV*

	Within District (FE)		**Between District (RE)**	
	Democratic	Republican	Democratic	Republican
District PVI +/-	0.005*	0.005*	0.004**	0.004**
	(0.003)	(0.003)	(0.002)	(0.002)
District PVI +/-^{2}	-0.000**	-0.000**	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Primary Type: Incumbent Primary	0.144***	0.144***	0.156***	0.156***
	(0.045)	(0.045)	(0.038)	(0.038)
Primary Type: Open Primary	0.012	0.012	0.058*	0.058*
	(0.035)	(0.035)	(0.032)	(0.032)
% Women State Leg	0.003	0.003	0.003	0.003
	(0.004)	(0.004)	(0.004)	(0.004)
Quality Woman	-0.295***	-0.295***	-0.415***	-0.415***
	(0.031)	(0.031)	(0.026)	(0.026)
District White %	0.129	0.129	0.082	0.082
	(0.226)	(0.226)	(0.133)	(0.133)
Median Income ($10,000s)	0.019	0.019	-0.013	-0.013
	(0.019)	(0.019)	(0.010)	(0.010)
Median Age	-0.005	-0.005	-0.002	-0.002
	(0.010)	(0.010)	(0.006)	(0.006)
Urban Density	-0.004	-0.004	-0.008	-0.008
	(0.015)	(0.015)	(0.008)	(0.008)
District Area	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Number of Candidates	-0.023	-0.023	-0.024	-0.024
	(0.018)	(0.018)	(0.017)	(0.017)
Number of Candidates^2	0.003*	0.003*	0.003*	0.003*
	(0.001)	(0.001)	(0.001)	(0.001)
Constant	0.847**	0.847**	0.958***	0.958***
	(0.378)	(0.378)	(0.225)	(0.225)
Observations	1,606	1,606	1,606	1,606
R-squared	0.151	0.151	-	-
Number of panel	470	470	470	470

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
(Primary Type Reference Category: Challenger Primary)

***Table A.13**: Women Running Descriptives by Incumbent Status*

Primary Type	**Women Running?**	**Frequency**	**Percentage**
Challenger	No	795	54.08
	Yes	675	45.92
Incumbent	No	800	62.11
	Yes	488	37.89
Open-Seat	No	223	38.92
	Yes	350	61.08

***Table A.14**: Women Winning Descriptives by Incumbent Status*

Primary Type	Women Winning?	Frequency	Percentage
Challenger	No	1,058	71.97
	Yes	412	28.03
Incumbent	No	1,053	81.75
	Yes	235	18.25
Open-Seat	No	416	72.60
	Yes	157	27.40
None[24]	No	2,977	80.26
	Yes	732	19.74

In Table A.15, we demonstrate the pervasiveness of this pattern over time. Women have consistently struggled to win incumbent primaries, doing so at roughly 16% of the time between 2006 and 2016. In the final two election cycles in our data, we do see an uptick in women's success in this type of primary, with a roughly 4% increase in 2018 and 2020. Extending our temporal trends from the main paper, Figure A.4 and Figure A.5 plot the rates of women running and winning over time, respectively.

***Table A.15**: Incumbent Primaries by Year & Gender Winner*

Year	N of Incumbent Primaries	Winner Woman	Winner Man	% Woman
2006	95	14	81	14.74
2008	114	20	94	17.54
2010	166	28	138	16.87
2012	189	31	158	16.40
2014	160	26	134	16.25
2016	185	30	155	16.22
2018	182	38	144	20.88
2020	197	48	149	24.37

[24] In this category, women winning refers to whether or not a woman was nominated as the candidate for a general election absent the presence of a contested primary.

***Figure A.4**: Women Running Temporal Trends by Incumbent Status*

***Figure A.5**: Women Winning Temporal Trends by Incumbent Status*