WOMEN'S WORTH: EVALUATING THE EFFECTS OF THE GENDER WAGE GAP ON THE SUCCESS OF
FEMALE CANDIDATES FOR THE US HOUSE OF REPRESENTATIVES

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WOMEN'S WORTH: EVALUATING THE EFFECTS OF THE GENDER WAGE GAP ON THE SUCCESS OF FEMALE CANDIDATES FOR THE US HOUSE OF REPRESENTATIVES

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ABSTRACT

Gender-based economic inequality in the United States is insidious; its far-reaching implications impact community structure, family stability, and the nation's economic future. While some effects are widely known, there is limited research on how large gender wage gaps influence voting patterns, representation, and gender parity in national political leadership. This study attempts to fill the gap in existing literature, assessing the extent to which the gender wage gap influences election outcomes of female candidates for the House of Representatives. Using demographic data and a constructed gender wage ratio key variable for congressional districts in six election years (2006-2016), this study explores two related inquiries. The first is whether the wage gap influences the likelihood of a woman running in a congressional election, and the second is whether the wage gap influences the likelihood of a woman winning a congressional election. The findings show no independent effect of the gender wage gap on the likelihood of female participation in House races. However, the study's results demonstrate a strong correlation between the success of female candidates running for Congress and the magnitude of the wage gap. In districts where the wage gap is small (wherein women and men have relatively equal earnings), women are more than twice as likely to win their races than in districts that have an average wage gap. Even after controlling for a suite of demographic indicators, this relationship remains statistically significantly distinct from zero. If we continue to push for gender equality in wages, benefits, workplace opportunities, and political representation, our country will become more economically vibrant and representationally equitable.

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The gender wage gap is stark in the United States. As of September 2019, women are paid just $0.82 on average per every $1.00 a man earns, yielding a yearly earnings gap of $10,194.[1] Women of color and single mothers are disproportionately affected. Despite growing awareness of the gender wage gap and increased activism to encourage gender parity in the workforce, structural barriers still exist. Women lack opportunities in lucrative job markets, their wages are stymied because of caregiving responsibilities that lead to long-term absences, and implicit (and explicit) discrimination prevents women from moving into higher wage roles at the same rate as men.[2] That said, the gender wage gap is not a problem in a vacuum. Gender-based economic inequality is insidious; its far-reaching implications impact community structure, family stability, and the nation's economic future.

While some effects are widely known, there is limited research on how large gender wage gaps influence voting patterns, representation, and gender parity in national political leadership. Though the United States population includes more women than men, women are considerably underrepresented in all levels of government, particularly in Congress. In 2019, there were just 126 female representatives (about 23% of the body) and 25 female senators (25% of the body).[3] Equal and accurate representation of women is the first step in ensuring long-term gender equality and more effective policymaking that reflects the needs of women and families.[4] Pinpointing the reasons why women are less likely to run for office and less likely to win as candidates will help inform policies that aim to increase gender equity. The effects of the gender

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[1] "Fact Sheet: America's Women and the Wage Gap."
[2] Flynn, "I'll Just Stay Home: Employment Inequality Among Parents," 395.
[3] "Women in the U.S. Congress 2019."
[4] Pepera, "Why Women in Politics?"

wage gap on issues that affect all people, like voting and representation, must be studied in order to develop evidence to support closing the gap. Additional research is necessary to influence change.

No research on the gender wage gap's effect on female political representation has been completed in the United States, and this paper attempts to fill the gap in existing literature. This study seeks to answer the questions: Does the gender wage gap impact the success of female candidates for the House of Representatives? If so, in which direction? To the extent to which the wage gap is a measure of women's agency and social standing, I expect that as agency and social standing increase, internal and external perceptions of women as able policymakers increase. Likewise, with greater social standing, women as a voting bloc become more influential. Subsequently, as the wage gap grows smaller, I expect female candidates to run in and win elections more often.

This study assesses the extent to which the gender wage gap influences election outcomes, controlling for a series of district-level indicators. Using demographic and structural data and a constructed gender wage ratio key variable for congressional districts in six election years (2006-2016), I predict the likelihood of participation and success of female candidates. The unit of analysis is congressional district-year. Using two election outcome dependent variables, constructed from Rutgers Eagleton Institute of Politics Center for American Women in Politics (CAWP) data, I predict a) if at least one woman participates in a House race and b) given that at least one woman participates, the success of female candidates. I use a series of logit fixed effects models to account for unobserved stable characteristics of congressional districts and include year dummies to account for temporal variation in factors such as the economy.

While the wage gap is a well-known and highly discussed contemporary issue, its effects on social patterns are not. The relationship between the wage gap and representation have not yet been explored, which is particularly important considering the potentially circular association between these phenomena. The findings show no independent effect of the gender wage gap on the likelihood of female participation in House races. However, the study's results demonstrate a strong correlation between the success of female candidates running for Congress and the magnitude of the wage gap. The more we know about the wage gap and representation, the more our representatives can work to close the gap. This study should invigorate further scholarship into the wage gap's effects on willingness of women to become leaders and the implications of a shrinking wage gap on representation over time.

Causes of the Gender Wage Gap

The gender wage gap in the United States is well researched and documented.[5] Many researchers have offered plausible and interwoven causes for this phenomenon, while others have identified potential long-term consequences. Although the wage gap in the United States has diminished substantially since the post-war era, the Institute for Women's Policy Research calculated that wage parity will not exist until 2059 at the current pace of change.[6] The most commonly cited reason for a substantial earnings gap is the prevalence and responsibility of women to be full-time (non-labor force) child caregivers and homemakers.[7] Though women have become more likely to participate in the labor force and receive more education after World War II, they still bear a disproportionate responsibility to care for children.[8] Blau and Kahn built off decades of research to review additional "traditional factors" of the gender wage gap, including the amount of labor experience, lack of exposure to different fields, and expectations around family life.[9] They also reviewed more novel indicators, such as soft skills and norms around women in the workforce. For example, women are less likely to negotiate for salary and

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[5] "Pay Equity & Discrimination"; Schlozman, Burns, and Verba, "'What Happened at Work Today?': A Multistage Model of Gender, Employment, and Political Participation"; Blau and Kahn, "The Gender Wage Gap: Extent, Trends, & Explanations"; Aizer, "The Gender Wage Gap and Domestic Violence"; Stockemer, "Income Inequality and Women's Descriptive Representation."

[6] "Pay Equity & Discrimination."

[7] Blau and Kahn, "Female Labor Supply: Why Is the United States Falling Behind?," 253; Flynn, "I'll Just Stay Home: Employment Inequality Among Parents," 395.

[8] Blau and Kahn, "The Gender Wage Gap: Extent, Trends, & Explanations," 807.

[9] Ibid.

promotions than men, which ostensibly leads to a greater earnings gap.[10] Both structural and normative societal attributes contribute to the wage gap.

Additionally, external factors such as government policies can influence the wage gap. Blau and Kahn compared United States female labor force participation against rates in other advanced nations and found that participation in the United States has fallen, even after significant growth in the late 20th century.[11] They argued that other nations' policies that promote women in the labor force (e.g., public childcare, parental leave, equal educational opportunities) effectively encourage women to join and remain there.[12] Though women have entered the labor force at much higher rates since the 1940s, the pace has slowed substantially, and those who do participate are paid far less than their male counterparts.

Consequences of the Gender Wage Gap

Not only is the scholarly literature robust in explaining the origins of the wage gap, but there is a rich body of knowledge related to the consequences of the gender wage gap as well. The wage gap contributes to a multitude of societal outcomes, including family economic instability, childhood poverty, female dependence on male breadwinners, and intergenerational immobility.[13] Though this is not an exhaustive list, it is clear that consequences are particularly stark for women. For instance, a decline in the wage gap in United States counties led to a decline in domestic violence, and places with higher wage gaps saw more cases of abuse,

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[10] Stuhlmacher and Walters, "Gender Differences in Negotiation Outcome: A Meta-Analysis," 653.
[11] Blau and Kahn, "Female Labor Supply: Why Is the United States Falling Behind?," 254.
[12] Ibid., 252.
[13] "Pay Equity & Discrimination."

according to a study on the relationship between the wage gap and domestic violence.[14] The study notes that when the wage gap is small, women work more, allowing for more financial independence and less time spent with abusive partners.[15] I now turn to a particularly relevant concern to this paper: how the wage gap impacts female representation.

Relationship Between the Wage Gap and Female Representation

While it is reasonable to expect that a relationship exists between the severity of the gender wage gap and female representation and political participation, there is no significant literature that directly supports a connection one way or the other. Only one study has focused on the gender wage gap and voting patterns directly. Adnan and Miaari studied Jewish and Arab women in Israeli voting districts to understand how gender inequities and party choice interact. They found that in localities in which nationalist parties are voted into power, gender wage gaps are greater and more persistent, indicating that political choice may directly influence levels of equity.[16] Further, they noted that cultural norms may dictate both voting patterns and reluctance to encourage parity in the workforce.[17] Because no other major studies have addressed the issue of this paper directly, the following sections develop a contextual framework in which to situate the present study.

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[14] Aizer, "The Gender Wage Gap and Domestic Violence," 1847.
[15] Ibid., 1858.
[16] Adnan and Miaari, "Voting Patterns and the Gender Wage Gap."
[17] Ibid., 36.

Factors Associated with Female Political Participation

Because I hypothesize that the gender wage gap impacts female agency and independence, it is important to understand the factors that influence female political participation. The ability and willingness to participate in the political process hinges on several demographic and social factors. Economic barriers reduce the amount of political participation, and this inequality disproportionately impacts women. Verba, et al. famously concluded that higher resourced people are more politically active, developing the idea that one needs time and money to be willing and able to participate in politics.[18] Thus, wealthier people shape policy to suit their needs; conversely, those without resources or political agency do not participate, and policies that may suit them are never developed.[19] I extrapolate that women who face a wage gap are, by definition, less politically powerful than their male counterparts, for they have fewer resources to participate effectively.

Relationship dynamics also contribute to women's ability to participate in politics. It is widely known that increases in education and social capital lead to more civic engagement, but women, especially single women, are often less educated and left physically isolated.[20] Isolation can occur because of working and living in the home, a controlling partner, or lack of leisure time due to inconvenient or long work hours. Low-income women, who face additional structural barriers to participation, are particularly prone to social isolation.

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[18] Verba et al., "Voice and Equality: Civic Voluntarism in American Politics."

[19] Gilens, *Affluence and Influence: Economic Inequality and Political Power in America*.

[20] Berinsky and Lenz, "Education and Political Participation: Exploring the Causal Link," 357; Schur, "Employment and the Creation of an Active Citizenry," 754. Berinsky and Lenz found that education is a moderator through which other factors increase political participation.

Single women who are heads-of-households are often marginalized through reliance on male partners or social services, and interaction with such agencies can lead to general distrust or disinterest in politics and government.[21] For example, there is a relationship between marriage and divorce on female economic independence (and therefore political independence). Divorced women are more likely to participate in the political process, because they become more reliant than their male partners on social safety net programs after divorce.[22] This is because men are generally the major breadwinners and remove wealth from the relationship upon divorce. In high divorce rate areas, women are more likely to support Democrats and be more politically engaged overall.[23] Additionally, Corman, et al. found that women who received public support participated more in politics (via voting) than those who did not receive a public benefit, especially in presidential elections.[24] They concluded that the provision of increased social services through welfare reform can promote female participation in their communities and civic duties.[25] Importantly, women who become more economically secure are able to participate and ostensibly have a louder say in their representation. Economic power determines much political participation.

In order to achieve economic security, especially for single women, one must have steady employment. The availability, quality, and benefits of work also drive female political participation. Increases in female work hours can increase political participation through improved social networking, economic independence, new skills, and exposure to democratic

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[21] Soss, "Lessons of Welfare: Policy Design, Political Learning, and Political Action," 376.
[22] Edlund and Pande, "Why Have Women Become Left-Wing? The Political Gender Gap and the Decline in Marriage," 953.
[23] Ibid., 952.
[24] Corman, Dave, and Reichman, "Effects of Welfare Reform on Women's Voting Participation."
[25] Ibid., 1447.

theory via organized laborers.[26] However, as work hours increase, argued Schlozman et al., female political participation declines.[27] This may occur because as employment (and earnings) increase, leisure time decreases, leaving less opportunity for political activity – especially because women are typically responsible for a larger share of non-labor force work than men.[28]

In addition to the economic security a job can provide, employment can also be a catalyst for increased participation, especially through the #MeToo era lens. Workplace discrimination, which is common in many industries, muddies the relationship between employment and participation; while a woman who faces discrimination may become more politically active, the act of discrimination itself may discourage and further marginalize her, leading to less political participation.

Coupled with their individual responses to the workplace, gender share of the workforce is also important in determining political power and participation. Voter participation is highly positively correlated with the percent of the female workforce that is employed.[29] Once women gain a large share of the overall workforce, they are more likely to become a viable voting contingent. Thus, as female labor market participation increases, women become a more desirable voting bloc for which candidates vie. In turn, argued Rosenbluth, Salmond, and Thies, parties will offer more female candidates to reach this growing voting bloc.[30] Women have a

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[26] Schur, "Employment and the Creation of an Active Citizenry"; Schlozman, Burns, and Verba, "'What Happened at Work Today?': A Multistage Model of Gender, Employment, and Political Participation."
[27] Schlozman, Burns, and Verba, "'What Happened at Work Today?': A Multistage Model of Gender, Employment, and Political Participation," 34.
[28] Ibid., 40.
[29] Cebula, Payne, and Saltz, "Determinants of Geographic Voter Participation Rate Differentials: The 2014 Mid-Term Election," 41.
[30] Rosenbluth, Salmond, and Thies, "Welfare Works: Explaining Female Legislative Representation," 165.

unique relationship to the labor force – they are often less well compensated, hold fewer high skilled jobs, and hold fewer positions of power than men, which can decrease their civic participation. However, those who do work are exposed to new ideas, people, and motivations for increased political participation, and their participation makes them more influential voters.

Gender Differences in Representational Needs

Next, I turn to the importance of female political participation; research has shown that the representational needs of men and women are different.[31] When women are not empowered to participate in politics, their voices, and thus their representation, is stymied. There are many types of gendered policies: those that impact women directly, like laws that restrict abortion; those that impact women indirectly, like childcare proposals; and those that do not specifically implicate gender, but are more likely to impact women, like social services spending.[32] While men and women, especially those in the same political party, mostly agree on policy proposals, women have distinct needs. For instance, women are more likely to require, and thus vote for, more generous social programs.[33] Women are also more likely to support less violent responses to crises, especially during international conflicts. Following this logic, Griffin, Newman, and Wolbrecht's telling piece reviewed the representational equality between men and women in United States congressional districts.[34] They found that while representation of women overall may not be equal, district representatives represent men's and women's needs equally – women's

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[31] Sapiro and Shames, "The Gender Basis of Public Opinion.," chap. 1.
[32] Ibid.
[33] Ibid.
[34] Griffin, Newman, and Wolbrecht, "A Gender Gap in Policy Representation in the U.S. Congress?"

"dyadic" (local and direct) representation is relatively equal to those of men.[35] They noted that this equality could be because there are more women in the United States than men, and women are more likely to vote than men. They also found that Democrats generally represent women more effectively by passing female- and family-friendly bills, while Republicans represent men more effectively, constituting two gender representational gaps.[36] Complementing this work, Simon and Palmer showed that regardless of party, women represent women better in general by supporting women's issues and issues that disproportionately impact women.[37] Thus, it is important to turn to gender inequality in representation next.

Reasons for Gender Inequality in Representation

In the United States, the first female was elected to Congress in 1916. Since then, 325 women have been elected to the House of Representatives; 63% of those elected held office since 1992, and nearly half were only elected after 1997.[38] Throughout the twentieth century, the most common reason a woman became a representative was to replace her dead spouse. Thus, though women have been on the political scene for over a century, only recently have they become established members of the political elite. Even more striking is that despite their history as political participants, women make up less than a quarter of congressional representatives to this day. There are far fewer Republican than Democrat representatives who are women, which may further indicate gender preferences between parties.

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[35] Ibid., 36.
[36] Ibid., 53.
[37] Simon and Palmer, "The Roll Call Behavior of Men and Women in the U.S. House of Representatives, 1937–2008."
[38] Desilver, "A Record Number of Women Will Be Serving in 116th Congress."

After reviewing gender inequities in agency, economics, and political participation, it may be unsurprising that there are so few female representatives. Upon closer examination, there are several additional factors specific to power inequities to review. First, there are certain unavoidable biases to consider. People tend to vote for those who look like themselves, which is true for gender as well.[39] That said, people are more confident voting for those with traditionally male characteristics, like being articulate (not to presume that all men naturally have these desirable traits).[40] Further, it is commonly known that when women exhibit these desirable "male" traits, like decisiveness and directness, they are seen as overly aggressive compared to male peers. Because of "social desirability pressures," people tend to overstate their support for female, as well as minority, candidates.[41] This implies that even polling data may not paint a complete picture of bias against women in politics. That said, there is evidence of a different landscape completely. Brooks refuted this notion in her study, in which she found that there was no significant bias against women, and women won races at a relatively similar rate as men.[42] To be sure, bias exists, but the extent to which it impacts female candidates is uncertain.

Where women run matters – their localities help determine how viable their candidacies are, according to a study on district characteristics by Palmer and Simon.[43] For example, women are more likely to win congressional races in smaller, urban districts that have higher rates of education, ethnic diversity, and wealth, on average. Conversely, women are less likely to win in

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[39] Matland and King, "Women as Candidates in Congressional Elections," 10.
[40] Ibid., 9; "Americans' Views of Women as Political Leaders Differ by Gender."
[41] Krupnikov, Piston, and Bauer, "Saving Face: Identifying Voter Responses to Black Candidates and Female Candidates," 253.
[42] Brooks, *He Runs, She Runs: Why Gender Stereotypes Do Not Harm Women Candidates*.
[43] Palmer and Simon, *Breaking the Political Glass Ceiling: Women and Congressional Elections: Second Edition*, chap. 7.

large, rural districts that have more blue-collar workers, higher marriage rates, and more young children.[44] In general, economic inequality makes it more difficult for women to win elections.[45] Wealth inequalities disproportionately impact women, and as such, women who would like to run for office are already at an experiential, economic, and social disadvantage.[46] Additionally, studies have placed importance on the role of institutions in districts. For example, Setzler found that religious differences and the religiosity of a district directly impacts the rate of success of female candidates.[47] His work on religion coincides with investigations of other institutional factors, such as partisanship. Studies that have explored female candidate viability have controlled for demographic and behavioral patterns across and within districts, which will be done in this study as well.

Finally, women face a distinct challenge to winning elections that can be classified as a structural, latent bias. First, when women run in elections, more people will enter the race, including women, leading to more competition and less distinction between candidates.[48] Second, those who do enter the race after women have announced their candidacies are generally "better" competition – they have more experience or political clout.[49] While this occurrence cannot be traced to a single reason, it may be that once a woman enters the race, others who may have been reluctant to join are emboldened by her choice. Third, there are very few successful

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[44] Ibid.
[45] Stockemer, "Income Inequality and Women's Descriptive Representation," 33.
[46] Ibid., 35.
[47] Setzler, "Religious Differences among Congressional Districts and the Success of Women Candidates," 519.
[48] Lawless and Pearson, "The Primary Reason for Women's Underrepresentation? Reevaluating the Conventional Wisdom," 76.
[49] Milyo and Schosberg, "Gender Bias and Selection Bias in House Elections," 41.

female incumbents,[50] and this may occur, in part, because people join the race to vie for a female incumbent's seat at a higher rate than they vie for a male incumbent's seat.[51]

This political landscape makes it much more difficult for women to win and provides an explanation for why fewer women run in the first place. Anzia and Berry's work on performance of Congressmen and women provide a fascinating view of the effect this field creates.[52] Because there is selection bias against women and it is harder for a woman to win an election, only the brightest, most competitive will run, and only the top female candidates will win.[53] Anzia and Berry found that due to this pattern, female representatives are more effective politicians and representatives than their male peers. Finally, they found that growing numbers of female candidates result in more women in office, which in turn, provides more "substantive" representation for women across the country, leading to more female candidates in the future. This condition provides the basis for my conceptual model and this study.

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[50] Matland and King, "Women as Candidates in Congressional Elections," 5.
[51] Lawless and Pearson, "The Primary Reason for Women's Underrepresentation? Reevaluating the Conventional Wisdom," 75.
[52] Anzia and Berry, "The Jackie (and Jill) Robinson Effect: Why Do Congresswomen Outperform Congressmen?," 478.
[53] Ibid.

Conceptual Model

The conceptual model in Figure 1 shows the hypothesis that the gender wage gap in United States congressional districts impacts the success of female candidates within them.
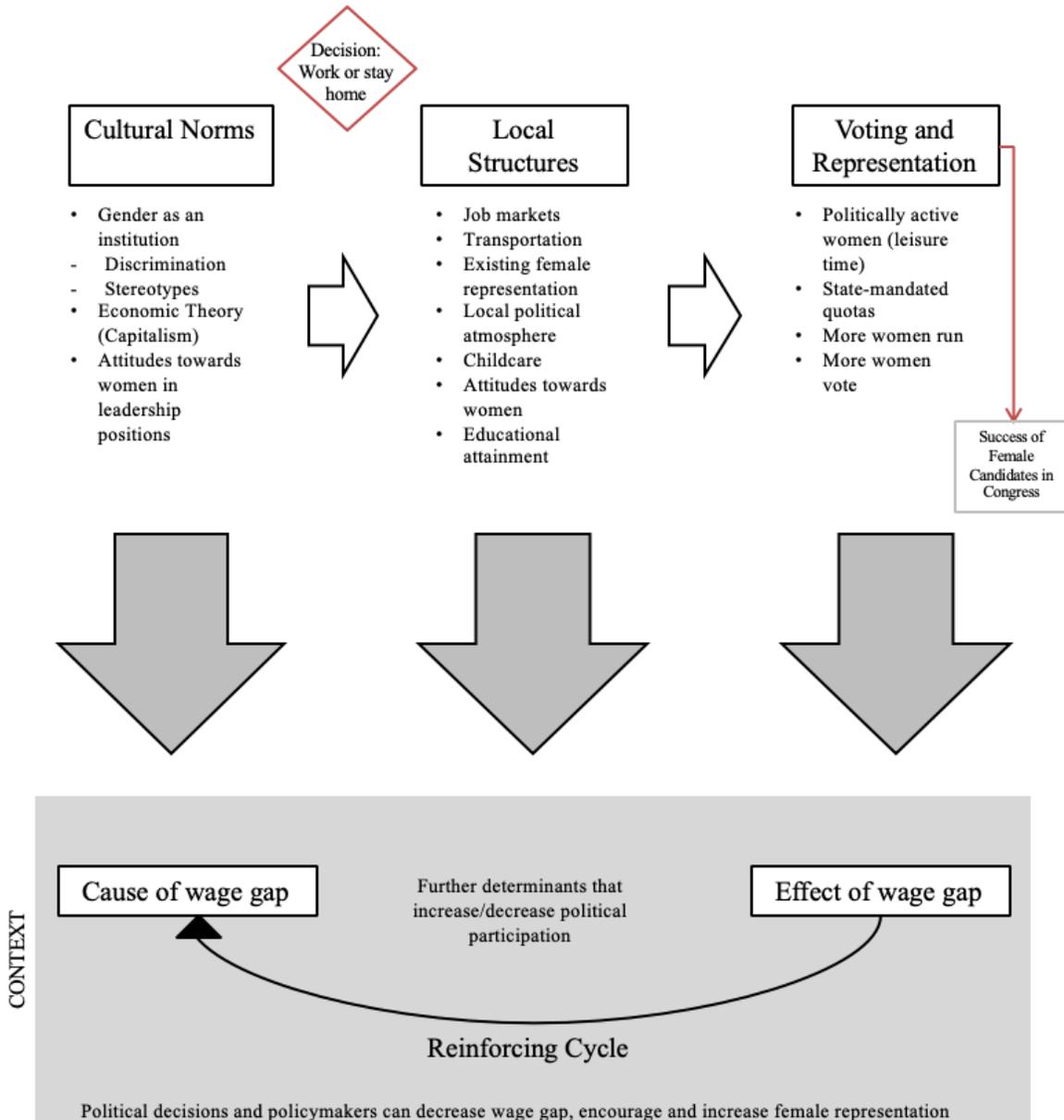
Figure 1. Conceptual Framework on Women's Agency and Female Representation

This connection begins in the cultural fabric of the district, including the underlying attitudes towards women in the workplace and in leadership positions, economic structure, and the prevalence of stereotypes that limit female agency. These intrinsic community characteristics influence how local structures develop and evolve, impacting how women exist and interact with others in the district. Access to good jobs, equal pay, transportation, childcare, and education directly impact female economic security, which, coupled with the political climate, can impact how, when, and why women vote (or do not vote). Thus, local structures, which often influence the gender wage gap, also help determine female political participation, both as voters and as candidates.

Importantly, this model illustrates the self-reinforcing nature of the relationship between the wage gap and female agency and political representation. I hypothesize that as women gain economically (and face a smaller wage gap), their districts are more likely to elect female representatives. The districts in which women succeed economically should also see increased female voter participation and fewer cultural barriers to women winning (including stigma, stereotypes, and reluctance to vote for women). In turn, as more women become representatives, they pursue policies that decrease the gender wage gap, empowering women to vote in, run for, and win future elections.

DATA AND METHODS

Data

To create the dataset, this study uses a variety of sources. First, I employ several data tables from the American Community Survey (ACS), an annual survey of 3.5 million households that collects a vast variety of demographic, social, and population data. The United States Census Bureau administers and distributes the ACS. Unlike the decennial Census, the ACS is continuously conducted, enabling the Bureau to collect an arsenal of current population information. The ACS collects data through in-person and telephone interviews and surveys a representative sample from all fifty states, the District of Columbia, and Puerto Rico. The response rates for years relevant to this study are 97.7% in 2007, 98.0% in 2009, 97.6% in 2011, 97.3% in 2012, 96.7% in 2014, and 94.7% in 2016.

ACS Table S0201, "Selected Population Profile in the United States," includes 1-year estimates of congressional district-level demographic data, gathered for the 110th through 115th Congresses (corresponding years of 2007, 2009, 2011, 2012, 2014, and 2016 – 6 tables in total). Table S0201 is only available for Congress-specific district-level data in the years specified above. The data corresponds with each Congress, rather than year, because districts may be redrawn between Congresses. I use ACS estimates that are available for each Congress-year; for example, from the year in which the Congress began (the 110th Congress began in 2007), and from the year prior to when the Congress began (the 115th Congress began in 2017, but available data are from 2016). Table S0201 includes district income, economic, family, and relationship data, as well as transportation and commute information, industry types, and age, race, and ethnicity indicators. This study uses median district earnings from Table S0201 to develop a

variable that represents the wage differences between men and women in each Congress-year, which I refer to as a gender wage ratio.

ACS Table B20017, "Median Earnings in the Past 12 Months (in Inflation-Adjusted Dollars) by Sex by Work Experience in the Past 12 Months for the Population 16 Years and over with Earnings in the Past 12 Months" includes data for the years matching the available S0201 Table data noted above. With Table B20017 data, I create a wage ratio for Asian, Black, Hispanic, and White groups in each district for each year of interest, using median district earnings by race from race and ethnic group B20017 Tables. I merge all tables before creating a measure; after which time, I merge this measurement data into the final dataset (24 tables in total).

Finally, the present study uses a dataset from the Center for American Women and Politics Eagleton Institute of Politics at Rutgers University entitled "Women General Election Candidates for U.S. Congress and Statewide Elected Executive (2000-2018)" to develop the dependent variables. The data are available online, and after contacting the Center, I obtained a downloadable version. This dataset includes all female candidates who ran for a House of Representatives seat from 2000 to 2018, gathered annually through administrative records and state election returns. The rate of missingness is unknown.

Each dataset uses a different coding method for congressional districts by Congress, so I manually build a common link in each dataset (using existing variables to discern the congressional district name and year). I then merge all datasets using this custom crosswalk, "congressional district-year."

Analysis Sample

Ideally, the analysis would be performed using data from each congressional district for each of the six years of interest. However, data are not available for every congressional district for each year of interest. ACS data are missing for the following districts: Alaska at-Large (110th and 111th Congresses), Delaware at-Large (110th and 111th Congresses), Washington DC at-Large (110th and 111th Congresses), Montana at-Large (110th and 111th Congresses), North Dakota at-Large (110th and 111th Congresses), South Dakota at-Large (110th and 111th Congresses), Vermont at-Large (110th and 111th Congresses), and Wyoming at-Large (110th and 111th Congresses). ACS is also missing data for Puerto Rico, so the territory is excluded from the analysis. All ACS samples are weighted and representational; therefore, the analysis includes all available districts. A small portion of districts lack enough data to create race and ethnicity-level wage ratios – for these cases, the analysis includes wage ratios for available races and ethnicities only.

Only two districts lack enough election data to complete the analysis due to missing key dependent variable information: New Jersey District 1 (111th Congress) and Washington DC At-Large (112th-115th Congresses). These observations are excluded from the analysis as well.

Variables

Dependent Variables

<u>Female Participation in Race</u> – The first dependent variable in the analysis is binary, with the following outcomes: at least one woman ran in the congressional House race (coded as 1); or no women ran in the congressional House race (coded as 0). Using the CAWP "Women General

Election Candidates for U.S. Congress and Statewide Elected Executive (2000-2018)" data, if any woman ran in the district, I code the outcome as 1. If the district is not included in the CAWP dataset, I code the outcome as 0. The analysis drops districts that cannot be identified in neither the election dataset nor the ACS datasets.

Female Success in Race – The second dependent variable applies only if at least one woman ran in a congressional House race. This binary variable has the following outcomes: at least one woman ran in the congressional House race and a woman won (coded as 1); or at least one woman ran in the congressional House race and no woman won (coded as 0). Using the CAWP data, if there is at least one female candidate and a woman won the district, I code the outcome as 1. If there is at least one female candidate and a woman did not win the district, I code the outcome as 0.

Key Explanatory Variables

Gender Wage Ratio – Using median earnings for all congressional districts in the study, I calculate a simple proportion: female median earnings in USD (median earnings (dollars) for full-time, year-round workers) divided by male median earnings in USD (median earnings (dollars) for full-time, year-round workers). I develop race and ethnic group wage ratios using the same formula. A ratio of 1 indicates gender parity. A ratio below 1 indicates a gender wage gap wherein women earn less than men, on average, and a ratio above 1 indicates a gender wage gap wherein women earn more than men, on average. For example, if the gender wage ratio equals 0.79, a woman earns, on average 79% of what a man earns, or $0.79 for every $1.00 a man earns. Conversely, if the gender wage ratio equals 1.23, a woman makes, on average 123%

percent of what a man makes, or $1.23 for every $1.00 a man earns. In this sample, the ratio is a number between 0.12 and 6.09.

The gender wage ratio is approximately normally distributed around 0.78. The mean gender wage ratio is 0.80. To explore demographic statistics and run analyses, I categorize the wage ratio into a *below average wage ratio* (including districts in which the wage ratio is below one half of a standard deviation away from the overall mean of 0.80), an *average wage ratio* (including districts in which the wage ratio is within one half of a standard deviation above or below the mean), and an *above average wage ratio* (including districts in which the wage ratio falls above one half of a standard deviation away from the mean).

Table 1 indicates the minimum value, maximum value, mean, and standard deviations for each race and ethic group. Note, the gender wage ratio variable does not consider the potential wages of non-working people, many of whom are women.

Table 1. Means and Standard Deviations of Gender Wage Ratio, by Race and Ethnicity

Wage Ratio	*n*	Minimum	Maximum	Mean	Standard Deviation
Overall	2600	0.60	1.13	0.80	0.07
Asian	2538	0.12	6.09*	0.81	0.29
Black	2570	0.26	3.90	0.91	0.21
Hispanic	2595	0.33	4.86**	0.89	0.19
White	2598	0.56	1.76	0.76	0.07

*Outliers: * AZ-1 (110th Congress). The next highest wage ratio is 3.36 for Asians*
*   ** VA-9 (111th Congress). The next highest wage ratio is 2.66 for Hispanics*
Source: American Community Survey Table B20017 2006-2016, Weighted Estimates

Other Explanatory Variables

Total Population – This variable is count data of total population for the congressional district, including those in group quarters, such as dormitories, barracks, and correctional facilities.

District Unemployment Rate – This variable is the percent of the population 16 years and over who are in the labor force and are unemployed. In the ACS, one is unemployed if they do not attend a job, are actively looking for a job, and are ready to start working immediately upon hiring.

Female District Unemployment Rate – This variable is the percent of the female population 16 years and over who are in the labor force and are unemployed.

Median Earnings – This variable measures the median earnings in the district. According to the ACS, earnings include all self-employment and employment income before taxes, Medicare and Social Security deductions, and other deductible expenses. I break this variable into *male median earnings* and *female median earnings* in the district and adjust them to 2016 dollars.

Marital Status – This variable is a composite measure made from multiple variables collected through the ACS, originally obtained as continuous percentages of the population over 15 years old. The original categories include *now married (except separated), widowed*, *divorced*, *separated*, and *never married.* In this analysis, there are four categories: *married, widowed, divorced or separated* (created by combining *divorced* and *separated*)*, and never married.*

Unmarried Birth – This variable is the percentage of single women between the ages of 15 and 50 in the district who had a birth in the last year (12 months) as a percentage of all women who had a birth in the last 12 months.

Educational Attainment – I base educational variables on ACS categorical data, originally measured as continuous percentages of the population who have achieved certain educational levels. The original variables include percentages of the population 25 years old and older who have *less than a high school diploma*, is a *high school graduate (or equivalent)*, have *some college or an associate degree*, have a *bachelor's degree*, or have a *graduate or professional degree*. In this analysis, there are three levels: percentage of the population with *less than a high school degree*, *a high school degree or equivalent*, and *some college or more* (created by combining *some college or an associate degree*, *bachelor's degree*, and *graduate or professional degree*).

Age – Age is measured as the *median age in years* for the total population of the congressional district.

District Wealth – To measure wealth that does not include earnings directly (because the collection of earnings eliminates many women who may not work but are otherwise wealthy), I use two housing value measures. The first is the median value in USD of owner-occupied housing units in the district, adjusted to 2016 dollars. The second is the median value in USD of gross rent for renter-occupied housing units in the district, adjusted to 2016 dollars. Gross rent includes renter-paid utilities.

Poverty Rate – This variable uses the poverty rates the Census Bureau and the Office of Management and Budget determines for families and individuals. This variable is a percentage of people residing in the district whose income falls below the poverty line.

Social Services – To determine a broad measure of reliance on social services, I include this variable. It measures the percentage of households in the district that use food stamp (SNAP) benefits. In the ACS, dependence on food stamps is asked as a yes/no question.

Table 2 describes the means and standard deviations of variables included in the estimation models.

Table 2. Means and Standard Deviations of Variables Included in the Estimation Models

Variable	*n*	Mean	Standard Deviation
Total Population	2600	717,177.1	61,508.28
Economic Indicators			
District Unemployment Rate (%)	2600	8.26	3.03
District Female Unemployment Rate (%)	2591	7.88	2.84
Median Earnings			
Male Median Earnings (USD)	2600	51,013.09	11,147.71
Female Median Earnings (USD)	2600	40,268.55	8,194.61
Family Characteristics			
Marital Status			
Married (%)	2600	48.38	6.48
Widowed (%)	2600	6.02	1.19
Divorced or Separated (%)	2600	13.04	2.03
Never Married (%)	2600	32.57	6.37
Unmarried Birth (% of all women who gave birth)	2594	34.91	11.62
Demographic Indicators			
Educational Attainment			
Less than High School Diploma (%)	2600	14.17	6.66
High School Diploma or Equivalent (%)	2600	28.42	6.43
Some College or More (%)	2600	57.41	9.74
Median Age	2600	37.54	3.53
Wealth Indicators			
Median Housing Value (USD) (owner occupied)	2470	234,694.60	151,504.70
Median Rent Value (USD) (renter occupied)	2600	964.68	269.27
Poverty Rate (% of all families and individuals)	2600	14.88	5.72
Social Services (% receiving SNAP benefits)	2595	11.79	5.81

Source: American Community Survey Table S0201 2006-2016, Weighted Estimates

Data Limitations

       The largest limitation of the dataset is the inability to capture some concepts in the above conceptual model (Figure 1). Aggregate district-level attitudes towards women (at home, at the workplace, and in leadership positions) are unavailable. Attitudes make up the cultural norms that allow women to thrive or fail, and this kind of information is not uniformly recorded. Similarly, historic voting data for congressional districts in a compatible format is unavailable, which precludes the study from using political leanings (for both female and male voters) as a control measure. This may be important since many fewer women run and win in Republican-dominated races. Finally, the gender wage ratio measure uses median income data. This limits precise measurement, especially for those districts with extreme values.

       Due to limited availability, this study only uses data from only six recent Congresses. There is much to be learned from historical patterns and change over time with regards to women in politics, so additional years of data would be preferable.

Methodology

Empirical Model and Estimation Strategy

       Because the dependent variables are binary, I use a series of logit models to explore the relationship between the success of female candidates and the gender wage gap. A logit analysis estimates a model with binary variables to provide relative likelihood of an outcome relating to a base case. I report results in odds ratios; an odds ratio of greater than 1 implies that as the value of the independent variable increases (value of 1 if a binary variable), the likelihood of the dependent outcome increases. Likewise, if the odds ratio is less than 1, with an increase in value

of the independent variable, the likelihood of the dependent variable outcome decreases. To

create an odds ratio, I use statistical software to exponentiate the raw coefficient values. In

addition, I use a fixed effects model specification because of the longitudinal nature of the data –

information collected over multiple years from the same congressional districts. I use this

strategy to account for unobservable stable characteristics of congressional districts. I also

include year dummies to account for temporal variation in factors such as the economy.

In order to implement a logit model with fixed effects, I use the *clogit* command in Stata

statistical software 15.1[54] This estimation strategy is the native conditional logit model in Stata.

This estimation is particularly useful because it approximates a logit model even if static

unobserved heterogeneity is correlated with the independent variables. The *clogit* package allows

the user to select the fixed effects group identifier and report results as odds ratios.

Bivariate analyses (Tables 3, 4, and 5) present the means and standard deviations of

independent variables, first by gender wage ratio category, then by election participation and

outcome.

Because the second dependent variable is conditional on the first dependent variable, the

multivariate models begin by using dependent variable 1 (Female Participation in Race) and

continue to analyze independent variable effects on dependent variable 2 (Female Success in

Race). Models 1 and 2 (Table 7) explore the relationship between female participation in House

elections and the gender wage ratio; the former includes only the key dependent and independent

variables, while the latter includes controls for district demographic, economic, educational, and

family characteristics. I include these explanatory variables to understand how economic and

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[54] StataCorp, "Stata Statistical Software: Release 15.1."

demographic factors influence the participation, and ultimately success of female candidates in House races.

Next, I estimate a cascade of logit models (Models 3-8) to investigate the independent effect of the key explanatory variable, the gender wage ratio, on dependent variable 2 (Female Success in Race) as additional covariates are added. The additional explanatory variables control for relevant district demographic, economic, educational, and relationship characteristics. I also run a number of auxiliary regressions to investigate alternative explanatory variables' potential impacts on predicting candidate success.

Study Limitations

There are a few study limitations associated with the data and design of this analysis. Because the study uses multiple years' data for single congressional districts, there may be correlated error terms. To correct, I employ fixed effects methods for each congressional district. I also include year dummies to account for temporal variation in factors such as the economy.

There is also omitted variable bias, most notably the lack of data on the number of men running in each congressional district race. It was not possible to obtain a full list of male candidates, so the dependent variable uses an exclusion approach – instead of counting all men who ran, the second outcome of dependent variable 1 indicates that no women ran and assumes that *only* men ran. While full candidate data is important to have, so many men run in all congressional districts that I assume there are relatively few differences of male participation between districts and years; this also serves as rationale for using this outcome as the base case. Additionally, reliable information on historical voting behavior and attitudes towards women in

leadership is lacking. Finally, there is likely correlation between the number of women who ran

and the dominant political party in the districts. Without party data, the study does not account

for potential effects of partisanship.

There may be clumping of the first dependent variable in the No Women Ran group,

since many races do not include any female candidates at all. Similarly, the outcome of interest

in dependent variable 2, that a woman won her election, is relatively rare across the entire dataset

(about 20% of instances). However, when reviewing only cases in which at least one woman ran

in the race, females won at a rate of about 40%. This is an imprecise measure of female

candidate success, especially because the competitiveness of each race is unknown.

Lastly, some control variables, including *male median income* and *female median income*

in B20017 Tables have been censored at both high and low limits. For example, the lowest

median income is "$-2,300" and the highest is "$100,000+". I adjust for these limits in variable

cleaning, but important economic information may be obscured due to this censoring.

RESULTS

This study examines the relationship between the gender wage gap and the participation and success of female candidates for the United States House of Representatives. Using a series of bivariate and multivariate models, I investigate the strength of this relationship.

I begin with an exploration of differences between districts that have lower, average, and high wage ratios. I then perform difference of means tests on district level characteristics for each of my dependent variable outcomes (first, female participation in House races, second, female success in House races), to understand associations between electoral participation patterns and broad demographic trends. Next, I estimate a series of logit models to assess the independent effect of the gender wage gap, broken out by category, on the likelihood of female candidacy. Finally, I estimate a series of logit models to explore the effect of the gender wage gap on the success of female candidates, given that they run for office. I incrementally add district-level factors that may also predict electoral success, first economic indicators, then family characteristics, demographic factors, and finally indicators of wealth at the district level. In general, the gender wage ratio does not independently influence female participation in Congressional races, though it does significantly and independently predict women's success in House races, even after controlling for other relevant factors.

Diverse Wage Ratios: Districts Differ Substantially

With the first round of bivariate results, I explore how district features vary by intensity of the wage gap. Table 3 presents the average district level characteristics by *gender wage ratio* category. This variable categorizes districts into *below average*, *average*, and *above average*

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wage ratios for the United States. The *average* category includes districts with wage ratios within one half of a standard deviation from the national average; the *below average* category indicates that women make less than men compared to the average group, with wage ratios below one half of a standard deviation from the average, and the *above average* category indicates the opposite. Compared to the *average* category, nearly all characteristics are significantly different in both the *above* and *below average* groups.

Table 3. Average District-Level Characteristics in Each Wage Ratio Category

Variable	Gender Wage Ratio		
	Below Average n=903	**Average** n =997	**Above Average** n =700
Total Population	712,961.20***	723,083.90	714,202.50**
Economic Indicators			
District Unemployment Rate (%)	7.53***	8.13	9.39***
District Female Unemployment Rate (%)	7.13***	7.66	9.18***
Median Earnings			
Male Median Earnings (USD)	54,449.65***	51,239.31	46,257.71***
Female Median Earnings (USD)	39,298.81***	40,579.56	41,076.54
Family Characteristics			
Marital Status			
Married (%)	52.10***	48.96	42.74***
Widowed (%)	6.21*	6.10	5.65***
Divorced or Separated (%)	12.75***	13.18	13.20
Never Married (%)	28.94***	31.76	38.41***
Unmarried Birth (% of all women who gave birth)	32.18***	34.67	38.79***
Demographic Indicators			
Educational Attainment			
Less than High School Diploma (%)	12.41*	12.94	18.18***
High School Diploma or Equivalent (%)	30.40***	28.36	25.95***
Some College or More (%)	57.19***	58.70	55.87***
Median Age	38.21	38.06	35.94***
Wealth Indicators			
Median Housing Value (USD) (owner occupied)	207,752.80*	220,913.30	291,933.20***
Median Rent Value (USD) (renter occupied)	885.71***	957.73	1,076.43***
Poverty Rate (% of all families and individuals)	13.14***	14.34	17.88***
Social Services (% receiving SNAP benefits)	10.36***	11.63	13.86***

*Difference of means between columns 1 and 2 and 2 and 3 are statistically significant at ***p<0.001, **p<0.01, * p<0.05, † p<0.10*

Source: American Community Survey Table S0201 and Table B20017 2006-2016, Weighted Estimates

According to the results from the bivariate analysis, districts with *below average* gender wage ratios, wherein women make relatively less money than men (compared to women in other districts), have lower unemployment rates, higher male median income, and lower female median income than in *average* wage ratio districts. This is unsurprising because by definition, these districts have higher wage gaps. Additionally, there are significantly higher rates of marriage than in *average* districts. *Below average* districts have generally higher high school achievement rates but lower college attendance rates than districts with an *average* wage ratio.

The analysis shows that *below average* districts have relatively lower poverty rates and dependence on social services than both *average* and *above average* wage ratio districts (which have relatively higher poverty and social service usage rates overall).

Above average districts are also distinct, and results are unexpected given that these districts are relatively closer to gender wage parity than other places in the country. They tend to have higher unemployment rates and lower male median earnings compared to *average* districts, and educational achievement is far lower than in districts in the other categories (18% of the population in *above average* districts did not complete high school, compared to just 13% in *average* wage ratio districts ($p<0.001$)). *Above average* districts also have significantly higher birth rates to unmarried women than *average* and *below average* districts. This seems to imply that districts in which female and male earnings are more equal are also more economically disadvantaged, have lower educational attainment, and include more single-parent family structures. Finally, because they have much higher median housing and rent values than both the *average* and *below average* districts (*average* = \$220,913, while *above average* = \$291,933, $p<0.001$)*,* it is plausible that *above average* districts more often lie in urban areas.

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Where Women Run and Where Women Win

Next, I use additional bivariate analyses to explore the district-level differences between dependent variable outcomes (Tables 4 and 5). Table 4 shows the average district-level characteristics based on whether at least one woman ran for a House seat in the district (dependent variable 1 *Female Participation in Race*). The table also describes differences in means of multiple district-level indicators between the two outcomes. The female unemployment rate is slightly lower in districts in which no women ran, but female median earnings are significantly lower as well ($39,651 compared to $41,052, p<0.001). Female candidate-friendly districts have lower rates of marriage and a slightly younger populace. Interestingly, in districts in which no women ran, relatively more people have finished high school but have not completed any college education, compared to places in which women ran. Both median housing cost and median rental value are more expensive in districts where women ran in elections (homes cost over $30,000 more, on average (p<0.001)), seeming to corroborate Table 3's pattern of urban spaces being more gender egalitarian in politics and economics.

Table 4. Average District-Level Characteristics by Female Participation in Race. (Dependent Variable 1)

Variable	Female Participation in Race	
	At Least 1 Woman Ran *n*=1145	No Women Ran *n*=1455
Total Population	719,304.80	715,502.70
Economic Indicators		
District Unemployment Rate (%)	8.38	8.17†
District Female Unemployment Rate (%)	8.04	7.76*
Median Earnings		
Male Median Earnings (USD)	51,383.37	50,721.70
Female Median Earnings (USD)	41,052.22	39,651.84***
Family Characteristics		
Marital Status		
Married (%)	47.60	48.99***
Widowed (%)	5.85	6.15***
Divorced or Separated (%)	13.05	13.02
Never Married (%)	33.50	31.84***
Unmarried Birth (% of all women who gave birth)	34.96	34.88
Demographic Indicators		
Educational Attainment		
Less than High School Diploma (%)	14.09	14.22
High School Diploma or Equivalent (%)	27.47	29.17***
Some College or More (%)	58.44	56.61***
Median Age	37.38	37.67*
Wealth Indicators		
Median Housing Value (USD) (owner occupied)	253,557.40	220,301.80***
Median Rent Value (USD) (renter occupied)	1,005.49	932.56***
Poverty Rate (% of all families and individuals)	14.96	14.82
Social Services (% receiving SNAP benefits)	11.83	11.75

Difference of means between columns 1 and 2 are statistically significant at ***p<0.001, **p<0.01, *p<0.05, † p<0.10

Source: American Community Survey Table S0201 2006-2016, and CAWP Eagleton Institute of Politics at Rutgers University, Weighted Estimates

Table 5 describes the average district level characteristics based on whether a woman

won a House seat in the district (dependent variable 2, Female Success in Race). On average,

women won in districts where the female median earnings are greater, and where housing and

rental prices are higher – indicating urban regions (homes cost over $70,000 more, on average,

than places in which women did not win (p<0.001)). These districts also have slightly lower

educational attainment rates, with fewer people finishing high school than places where women

lost. Interestingly, women tended to win in areas of lower marriage *and* divorce rates, showing

potential propensity for single motherhood family structures.

Table 5. Average District-Level Characteristics by Female Success in Race. (Dependent Variable 2)

Variable	**Female Participation in Race**	
	Woman Won *n* =458	**Woman Lost** *n* =682
Total Population	711,819.80	724,823.10***
Economic Indicators		
District Unemployment Rate (%)	8.49	8.29
District Female Unemployment Rate (%)	8.16	7.95
Median Earnings		
Male Median Earnings (USD)	51,218.99	51,363.47
Female Median Earnings (USD)	42,011.60	40,269.95***
Family Characteristics		
Marital Status		
Married (%)	45.93	48.84***
Widowed (%)	5.69	5.96***
Divorced or Separated (%)	12.90	13.17*
Never Married (%)	35.47	32.03***
Unmarried Birth (% of all women who gave birth)	35.06	34.79
Demographic Indicators		
Educational Attainment		
Less than High School Diploma (%)	15.35	13.27***
High School Diploma or Equivalent (%)	26.04	28.47***
Some College or More (%)	58.61	58.25
Median Age	36.93	37.71***
Wealth Indicators		
Median Housing Value (USD) (owner occupied)	296,301.60	224,603.40***
Median Rent Value (USD) (renter occupied)	1067.42	961.89***
Poverty Rate (% of all families and individuals)	15.42	14.64*
Social Services (% receiving SNAP benefits)	11.79	11.84

Difference of means between columns 1 and 2 are statistically significant at ***p<0.001, **p<0.01, *p<0.05, † p<0.10

In Table 6, I provide a breakdown and distribution of wage ratio categories by each dependent variable outcome, with difference of means tests to show meaningful differences between outcomes. Notably, women participate in politics in districts with significantly higher gender wage ratios, on average, than those in which there were only male candidates (0.81 versus 0.79, $p<0.001$). Perhaps unsurprisingly, women won in districts in which the gender wage ratio is significantly higher than in districts in which they lost.

Table 6. Wage Ratio Category by Election Outcome. (Dependent Variables 1 and 2)

Variable	Election Outcome			
	Dependent Variable 1		Dependent Variable 2	
	No Women Ran	Woman Ran	Woman Lost	Woman Won
Mean Gender Wage Ratio	0.79	0.81***	0.79	0.83***
Wage Ratio Categories				
Below Average	38.49%	29.96%	35.92%	21.18%
Average	38.97%	37.55%	41.20%	32.53%
Above Average	22.54%	32.49%	22.87%	46.29%
Total (N)	100% (1455)	100% (1,145)	100% (682)	100% (458)

Difference of means between outcomes for each dependent variable are statistically significant at
***p<0.001
Source: American Community Survey Table B20017 2006-2016, and CAWP Eagleton Institute of Politics at Rutgers University, Weighted Estimates

Does the Gender Wage Gap Predict Female Political Participation?

As the bivariate results show, there is an association between the gender wage gap and female participation and success rates in statewide elections. This brings us to a discussion of the multivariate analyses. First, to explore the relationship between the gender wage ratio and the rate of female participation in races, I use a simple model (Model 1, Table 7*)* to see if any independent association exists. I use the 3-outcome independent variable of wage ratio

categories, with average wage ratio as the reference category. Though the bivariate models show

significant differences between the female median earnings between districts in each category,

there appears to be no association between the wage ratio and female participation. The year

variables post-2008, used to account for aggregate trends in districts over time, are all significant

at p<0.01 or less, indicating that compared to 2006, women are more likely to run in House

elections; the highest likelihood occurs in 2012, when women are almost twice as likely to run

than in 2006 (OR = 1.97, p<0.001).

Table 7. Odds Ratios of Logit Models Predicting Likelihood of Female Participation in Race

	Model 1 (OR) *n*=2055	**Model 2 (OR)** *n*=1895
Wage Ratio Categories		
Below Average	1.07	1.09
Above Average	1.24	1.12
Other Female Economic Indicators		
District Female Unemployment Rate (%)	--	1.12*
Female Median Earnings (USD)	--	1.00
Family Characteristics		
Divorced or Separated (%)	--	1.05
Unmarried Birth (% of all women who gave birth)	--	1.00
Other Demographic Indicators		
Educational Attainment Some College or More (%)	--	1.03
Median Age	--	0.88**
Other Wealth Indicators		
Median Housing Value (USD) (owner occupied)	--	1.00**
Median Rent Value (USD) (renter occupied)	--	1.00
Social Services (% receiving SNAP benefits)	--	0.97
Year Dummies		
2008	1.00	0.87
2010	1.60**	1.67†
2012	1.97***	2.21*
2014	1.58**	2.20*
2016	1.59**	2.27*
Chi-Square	33.02***(7)	57.70***(16)

***p<0.001 **p<0.01, * p<0.05, † p<0.10

After adding a suite of independent variables in Model 2, the wage ratio continues to have no independent effect on the likelihood of female participation in House races. Interestingly, this model indicates that as the district female unemployment rate rises, the likelihood of female participation rises, while as median age rises, the participation likely decreases. Years 2012 to 2016 dummies remain significant in this model, indicating that women are far more likely (about 120% more likely, $p<0.05$) to run in more recent years than in 2006.

Does the Wage Gap Influence Female Success in House Races?

While few conclusions can be made on the relationship between the gender wage ratio and the likelihood of female participation in House races, there seems to be a strong positive association between the success of female candidates and the district wage ratio, once they are in the race. The following cascade of logit models demonstrates the gender wage ratio's independent effect on the likelihood of women winning their Congressional races. I add successive domains of control variables to account for potential impacts on success, and throughout, the gender wage ratio remains a significant predictor of election success. Overall, compared to the national average gender wage ratio (0.80), districts that have an above average ratio (wherein women make more money, relative to other districts) are significantly more likely to elect a woman.

Table 8 presents several models exploring this relationship. Model 3, the simplest model, includes only the wage ratio categories and year dummies (the same approach taken with dependent variable 1 above). After accounting for differences over time, districts in which

women make relatively more money are twice as likely to elect a woman (marginally significant at p<0.10) than districts in which there is an average wage ratio. There is no relationship between the *below average* category and female candidate success.

Table 8. Odds Ratios of Logit Models Predicting Likelihood of Female Success in Race

	Model 3 (OR) *n*=324	Model 4 (OR) *n*=322	Model 5 (OR) *n*=321
Wage Ratio Categories			
Below Average	.86	0.92	0.87
Above Average	2.05†	2.16*	2.59*
Other Female Economic Indicators			
District Female Unemployment Rate (%)	--	0.95	1.00
Female Median Earnings (USD)	--	1.00	1.00
Family Characteristics			
Divorced or Separated (%)	--	--	0.58**
Unmarried Birth (% of all women who gave birth)	--	--	1.04
Other Demographic Indicators			
Educational Attainment Some College or More (%)	--	--	--
Median Age	--	--	--
Other Wealth Indicators			
Median Housing Value (USD) (owner occupied)	--	--	--
Median Rent Value (USD) (renter occupied)	--	--	--
Social Services (% receiving SNAP benefits)	--	--	--
Year Dummies			
2008	1.05	1.17	0.85
2010	0.67	0.86	0.66
2012	0.63	0.81	0.70
2014	0.71	0.80	0.74
2016	0.73	0.74	0.66
Chi-Square	5.84(7)	6.77(9)	20.18*(11)

***p<0.001 **p<0.01, * p<0.05, † p<0.10

To understand the strength of the association noted above, I add district-level variables that may explain in some part the success of women in House races. First, I add other female economic indicators in addition to the wage ratio measure, including female unemployment rate

and female median earnings. Even after accounting for these additions, there appears to be a strong association between success and being in an above average district (Model 4). The coefficient on the above average category is not only greater in magnitude than the first model (OR = 2.05 and 2.16, respectively), but it is now significant at the $p<0.05$ level. Though the female unemployment rate is used for theoretical considerations, I also ran an auxiliary model using the total unemployment rate; the models are very similar, and the variable of interest is still statistically different from 0.

Model 5 builds on Models 3 and 4 by adding family characteristics that may impact voting patterns and political preferences, especially for women. For instance, Model 5 shows that as the divorce rate rises, the likelihood that a woman wins decreases by almost half ($p<0.01$), while the birth rate to unmarried women has no substantial effect. After controlling for these factors, women who run in districts with a higher wage ratio are still about 2.59 times as likely to win their races than women running in average districts ($p<0.05$).

Next, I add the percentage of the district who has attained at least some college education to see if highly educated areas are more likely to elect women, and whether this relationship explains the association between the wage ratio and candidate success. While high educational attainment rate does not seem to have an independent effect (Model 6, row 11), the above average wage ratio category continues to have a strong effect at the $p<0.05$ level.

Model 7 in Table 9 shows the effect of additional relevant relationships between wealth indicators and the likelihood of women winning their elections. Though the bivariate tables show statistically distinct housing prices in districts in which women run and lose, the effect of higher housing prices is minute (OR=1, $p<0.05$).

Table 9. Additional Odds Ratios of Logit Models Predicting Likelihood of Female Success in Race

	Model 6 (OR) *n*=321	Model 7 (OR) *n*=299	Model 8 (OR) *n*=299
Wage Ratio Categories			
Below Average	0.89	0.82	0.84
Above Average	2.56*	2.82*	2.44†
Other Female Economic Indicators			
District Female Unemployment Rate (%)	0.99	1.23	1.28†
Female Median Earnings (USD)	1.00	1.00*	1.00
Family Characteristics			
Divorced or Separated (%)	0.59**	0.72†	0.78
Unmarried Birth (% of all women who gave birth)	1.03	1.03	1.02
Other Demographic Indicators			
Educational Attainment Some College or More (%)	0.97	1.01	0.99
Median Age	--	--	0.75*
Other Wealth Indicators			
Social Services (% receiving SNAP benefits)	--	0.92	0.79*
Median Housing Value (USD) (owner occupied)	--	1.00*	1.00*
Median Rent Value (USD) (renter occupied)	--	1.01†	1.00
Year Dummies			
2008	0.96	0.72	1.28
2010	0.76	0.72	2.00
2012	0.82	0.94	3.09
2014	0.87	1.15	4.91
2016	0.76	1.55	6.53†
Chi-Square	20.45†(12)	30.62**(15)	36.54**(16)

***p<0.001 **p<0.01, * p<0.05, † p<0.10*

In this model, I include the percent of the population who receive SNAP benefits to capture the effect of poverty, because the poverty variable was highly correlated with a number of explanatory variables. Even after testing for the effects of poverty itself in an auxiliary regression, the above average wage ratio variable is still marginally statistically significant at p<0.10. This indicates that the wage ratio effect is not sensitive to indicators of poverty. Finally, Model 8 adds the median age of the district, completing the suite of explanatory variables in this

study. This addition explains that women are far less likely to win in older districts; as the median age increases by a full year, women are about 25% less likely to win their races, on average ($p<0.05$). Once I account for age, the wage ratio remains only marginally significant at the $p<0.10$ level, explaining that those in above average districts are 2.44 times as likely to elect a woman than an average district. Age seems to explain some of the effect of the wage ratio, which could be due to differences in political preferences, needs for government services, and family and community structures between age groups.

Note, I ran an additional regression not included in the study wherein I used the suite of explanatory variables and specific wage ratio indicators for black, Hispanic, and Asians in the district. None of these indicators are significant at the 0.10 level, so they were excluded from the main findings of the study. Overall, even after accounting for several economic, familial, demographic, and wealth characteristics across districts, the results suggest that the wage ratio explains female election success: districts in which women are paid more equally are more likely to vote women into office.

DISCUSSION AND CONCLUSIONS

This study aimed to determine if the magnitude of gender wage gap substantively impacts female political participation, first exploring if the depth of the wage gap impacts the likelihood of women running in a Congressional election, and second examining how the gender wage gap impacts female election success. The present study is novel in exploring this relationship specifically. There was no evidence to support the first hypothesis; the results show no significant association between the gender wage ratio and the likelihood of women participating in House races. After introducing control variables from several salient district-level domains, the wage ratio categories remain insignificant predictors. This suggests that the impetus for women to run is independent of the variables in this model. However, once a woman enters the race, district-level wage ratios and additional demographic explanatory variables begin to influence her success.

In contrast to the first hypothesis, results with the second dependent variable revealed a significant, robust relationship between the gender wage ratio and female candidate success. Even after controlling for a variety of demographic factors that may correlate with both the gender wage gap and electoral success, the evidence suggests that women who run in districts with above average wage ratios are far more likely to win than women in average wage ratio districts. This above average indicator continues to predict success even when economic variables such as unemployment, poverty, wealth, and earnings are controlled for. This result makes sense – the study is based in the theoretical grounding that as women achieve more social capital and voting power relative to men, they are more likely to gain positions of influence and represent themselves more effectively. Districts in which there is a small gender wage gap

(where women and men make relatively similar wages), women are far more likely to win district-wide, highly publicized, and often tough races. Interestingly, as noted in the bivariate results, these same districts often have higher unemployment rates, lower wages, lower marriage rates, and lower educational attainment. It can be assumed that though these districts may be economically disadvantaged and more urban compared to the average and below average districts, the relative equality between men and women help female candidates win.

This conclusion is particularly important as it provides vital evidence for the need to close the gender wage gap. There is evidence that women contribute a great deal to effective leadership, and there should be gender parity in our federal government.[55] This study shows that increasing economic equality can help achieve representational parity, which will help not only those being represented, but the country's ability to govern effectively. Prior studies have shown that the gender wage gap has dire consequences for our nation's families, social services capacity, and structures of power, and the present analysis contributes new evidence to the field that the wage gap impacts our political institutions as well.

The current study is a modest start to what should be a larger exploration of the consequences of the gender wage gap on the United States' political process. Limitations to be addressed in future studies include lack of data on the number of male candidates; overall political preferences for voters in districts; race, ethnicity, and religious breakdowns; and measures of attitudes toward women. Using voter-level data may also provide more specific results, as district-level data distorts extreme values (which may be particularly telling). Finally, the independent variable wage ratio category provides evidence of broad strokes of the gender

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[55] The Rockefeller Foundation and Global Strategy Group, "Women in Leadership: Why It Matters," 6; Volden, Wiseman, and Wittmer, "The Legislative Effectiveness of Women in Congress," i.

wage gap, but this study could be enhanced by using more precise measures of the wage gap. The logistic statistical methods used in this study could also be made more robust with additional cases and more granular political and demographic data. This study is the first step in what should continue to be a vigorous exploration of the gender wage gap. The more information we have about its deleterious consequences, the more likely our representatives and business leaders will work to close it.

The gender wage gap has plagued this country since its founding, keeping women, especially women of color, low-income women, and single female heads-of-households economically and politically powerless. Closing the wage gap requires policy intervention and a broad shift in attitudes toward gender equality. This study confirms the hypothesis of the conceptual model above (Figure 1); the wage gap influences female political participation, which in turn influences the potential progress to close the wage gap. This cycle must be disrupted by increasing the number of women in politics and addressing the structural causes of the gender wage gap. If we continue to push for gender equality in wages, benefits, workplace opportunities, and political representation, our country will become more economically vibrant and representationally equitable.

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