Gender and Bipartisan Cosponsorship:

Evidence from the United States House of Representatives

By: Casey Mason

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I. Introduction

There is much speculation, both in the press and in general public discourse, and scholarship regarding the role and impact of female politicians. Influential females are rising to political prominence in increasingly high numbers, which has led to debate regarding the comparative effectiveness of female legislators, a historically underrepresented group. Although female representatives still make up less than a quarter of the House of Representatives, the number of women in the House has increased substantially over the past few decades. In the 2018 midterm election, a historic number of women were elected to the House of Representatives. Currently there are 102 female House representatives, which makes women 23.4% of the 435 members (CAWP). In 1993, the beginning of the period during which this study is focused, there were 48 female representatives, which accounted for 11.03% of the total members of the House. Of the 48, 36 were Democrats and 12 were Republicans. By 2010, the last year in this study, there were 79 women in the House, which accounted for 18.16% of the total representatives. Of the 79, 62 were Democrats and 17 were Republicans.

The increase in female representation in Congress has led the public to predict that “the women in Congress would bring a style of lawmaking that was ‘less confrontational, [and] more willing to reach reasoned, bipartisan compromise’” (Bauer et. al 2016). Female and male legislators alike have acknowledged the important role that women play in fostering cooperation during times of political tension. In discussing women’s roles in ending the 2013 government shutdown, Senator Susan Collins (R-ME)
stated of women, “Although we span the ideological spectrum, we are used to working together in a collaborative way” (Jackman 2013). Senators John McCain (R-AZ) and Mark Pryor (D-AR) noted that their female colleagues deserve most of the credit for pushing the compromise to reopen the government (Jackman 2013).

These assertions seem to support the conclusion that females are more likely to behave in a bipartisan manner than their male counterparts. Working across the political aisle is seen as both important and necessary in effective governing. In an increasingly partisan era (Poole and Rosenthal 2014), female politicians could be the answer to increasing bipartisan cooperation. Although the number of females in the House is relatively small, it is important to ask how the increase in women has already impacted bipartisan relations. Specifically, I assess how the increase in female legislators in the House of Representatives has related to the percentage of bipartisan cosponsors on House bills. Answering this question could provide key insight into the benefits of increasing female representation, which would strengthen the argument for electing women to office.
II. Literature Review

The House of Representatives

The United States House of Representatives is the lower chamber of the legislative branch of the U.S. government. In the House there are 435 legislators, one from each of the 435 Congressional districts across the United States. Representatives are elected every two years, corresponding with each two-year session of Congress. The number of representatives from each state corresponds to the population of that state. The number of representatives from each state changes as their state’s population becomes larger or smaller relative to the other states, based on the US Census data that is collected every ten years. The primary role of a representative is to draft legislation, which can occur in the form of bills, simple resolutions, concurrent resolutions, and joint resolutions. The legislation must pass in the House and in the Senate, the upper chamber of the legislative branch, before it is sent to the President for final approval.

I choose to look at the House of Representatives, as opposed to the Senate, for a few reasons. Given that the number of representatives from a state is based on that state’s population, the House is the more representative body. Additionally, prior to the 21st century, there were fewer than ten female legislators in the Senate, making analysis of the impact of female Senators difficult. I focus only on bills in this study, as is the precedent within the field (Gagliarducci and Paserman 2016). This decision is because bills have the force of law, and are the most substantial method for promoting a legislative agenda compared to other forms of legislation.
I choose to look at the aggregated bipartisan efforts of the House as a whole, rather than looking at the actions of individual legislators, because I am interested in seeing if even the addition of a small number of female legislators make a noticeable impact at the chamber level. While it is interesting to note individual behavior, the public observes, and is affected by, the collaborative nature of the body as a whole. Additionally, previous studies on this topic have tended to evaluate the bipartisan efforts at the bill level or individual legislator level (Andris et. al 2015; Gagliarducci and Paserman 2016; Paludi 2016; Bauer et. al 2017). I want to expand on previous studies by approaching the topic at the Congressional level.

Cosponsorship

Every bill introduced in the House of Representatives has a primary sponsor. This individual is most strongly associated with the content of the bill, and is generally responsible for garnering support for the bill. Each bill can be signed by any amount of cosponsors, who are individuals that want to be associated with the content of the bill but are secondary to the sponsor. There is a general agreement in literature that a bill’s sponsor has a responsibility to promote the bill’s passage through the chamber, and that attracting cosponsors to the bill is an effective means of moving the bill through the legislative process (Wowro 2001; Wilson and Young 1997). Wowro (2001) finds that if a bill has a large number of cosponsors, the representative has been able to convince others that the bill is worth supporting.

I define bipartisan cosponsorship as an instance in which a legislator not from the party of the bill’s sponsor signs on as a cosponsor of that bill. I count Independent representatives as bipartisan cosponsors for the purpose of this study. I use bipartisan
cosponsorship as an indicator of collaboration for a few reasons. First, cosponsorship is a broad measure of real collaboration. Cosponsorship represents a collaborative process in which legislators work together to craft and promote legislation (Bratton and Rouse 2011; Holman and Mahoney 2018). Further, cosponsorship is a measure that is widely documented and is consistently practiced across Congresses, and is reported by representatives to be indicative of collaboration (Fowler 2006; Kirkland 2011; Rosenthal 1981). Finally, cosponsorship is beneficial for policy making (Holman and Mahoney 2018). Bills with a greater number of cosponsors contain more effective public policy, have a higher likelihood of passage, and promote future collaboration between the individual cosponsors (Adler and Wilkerson 2013; Gutmann and Thompson 2012; Hibbing and Theiss-Morse 2002; Kirkland and Gross 2014).

While cosponsorship is a strong measure of collaboration, and by extension bipartisan cosponsorship is a strong measure of bipartisan collaboration, the latter form comes with additional considerations. Cosponsorship means sharing credit for a bill when one might wish to have full credit (Rosenthal 1981). Bipartisan cosponsorship might also hurt the cosponsor’s relationship with his or her own party if they are perceived to be a traitor (Holman and Mahoney 2018). Given the high costs of bipartisan cosponsorship, such an act should not be considered a symbolic or meaningless act. Therefore, instances of bipartisan cosponsorship can be seen as evidence of a legislator reaching across the aisle in an intentional and impactful way.

Roll call voting is perhaps the most commonly used measure of bipartisanship, and is seemingly the measurement of collaboration that gets the most media attention. However, I argue that roll call voting is not the strongest measure of collaboration for the
purposes of this paper. Andris et. al (2015) evaluate partisanship in the US House of Representatives by assessing all possible pairs of legislators to see how many times each pair voter the same way regarding roll call votes. They find that from 1949 to 2012, the probability of a cross-party pair occurring decreases substantially. They conclude that non-cooperation between political parties appears to have increased exponentially over time when evaluated solely using roll call voting. Nokken and Poole (2004) note that partisan alignment has a substantial effect on legislative behavior. They evaluate roll-call voting of Representatives and Senators that have changed political party in the course of their careers. They find that the most substantial changes in roll-call voting occur during periods of high polarization, from which they conclude that roll-call voting behavior is driven more by party alignment than ideology.

Therefore, roll-call voting is therefore not the best measure of bipartisan intentions, as by the time a piece of legislation gets voted on, legislators are likely to toe party lines. Bipartisan cosponsorship offers legislators the opportunity to publicly show support for legislation initiated by an individual not in their party without the commitment of roll call voting outside of party lines. Measuring bipartisan cooperation using roll call voting could provide results that indicate that there is less bipartisan cooperation happening in the House than there actually is.

Gender Differences in Legislative Activity

There exists a large body of literature that examines gender differences regarding cosponsorship behavior. A few recent studies have attempted to evaluate the effectiveness of female legislators, both as sponsors and cosponsors (Anzia 2013; Paludi 2016). Anzia and Berry (2013) use U.S. Congressional data to determine that female
legislators are more active legislators than men, in that they sponsor and cosponsor more legislation. They interpret these results to suggest that the existing public scrutiny of women allows for only the most outstanding female candidates to even reach Congress. Anzia and Berry argue that when real and perceived sex-based discrimination exists, as is indicated by survey data of voting-age adults (Dolan 2004), the women elected to Congress will outperform their male counterparts. They attribute this difference to what they call the “Jill Robinson effect,” named after groundbreaking African-American baseball player Jackie Robinson. Like Robinson, who was such a phenomenal talent that Major League Baseball chose to desegregate, females must prove that they are outstanding before they can even be elected to Congress.

Paludi (2016) uses data from the 111th to the 114th Congress to determine differences in frequency of female cosponsorship of a bill based on the gender of the legislator introducing that bill. She finds that in that timeframe, female legislators cosponsored an average of 6.20 bills that were sponsored by other females, as compared to 4.07 sponsored by male legislators. Further, she notes that in the House, the female representative introduced 29.65 bills on average, while male representatives introduced 27.2 on average in the same timeframe.

My study relies on the assumption that female representatives and male representatives behave differently once elected to the House. Both of these previous studies support this assumption by providing evidence that females are distinct from their male colleagues regarding cosponsorship behavior. Anzia and Berry and Paulid’s papers provide background for my expectation of differences in bipartisan cosponsorship due to the presence of women.
**Gender Differences in Cooperation**

Additionally, much attention has been devoted to the study of gender differences in cooperation. Bauer et. al (2017) use Congressional data to evaluate what happens when female legislators refuse to compromise. They find that female legislators are likely to face harsher punishments from their constituents and in the media for refusing to compromise than will their male counterparts under certain conditions. They note, in particular, that women will face the harshest punishments for not compromising if the topic is considered a female issue, or one that disproportionately impacts females. My work can develop from the findings of this paper because Bauer et. al provide evidence that there are external factors driving women to act in a collaborative manner.

Holman and Mahoney (2018) evaluate the role that female caucuses have on collaborative behavior of women in state legislatures. Utilizing cosponsorship data from over 140,000 pieces of legislation in 2015, Holman and Mahoney determine that, in the presence of a caucus, the share of women in the legislature increases collaboration amongst women in a linear fashion. They also find that, in the absence of a caucus, the share of women in the legislature increases collaboration amongst women, but in a curvilinear fashion. That is, women’s collaboration increases until women reach a 25% share of the legislative body, and then decreases. However, given the presence of a women’s caucus in the United States House of Representatives, the former finding is more relevant to my paper. Holman and Mahoney’s findings are consistent with the critical mass theory, which states that women must first pass a threshold of representation.
before they are able to implement policy changes. This paper provides evidence that the number of women in the legislature matters for collaboration. From this evidence I can further build upon my theory that increasing the number of women will foster bipartisan collaboration.

Lawless et. al (2016) evaluate gender participation in consensus building activities and its effect on legislative outcomes. They look at two regularly-scheduled social activities in the Senate, the Secret-Santa gift exchange and Seersucker Thursday, to determine gender differences in non-political social engagement. They found that across time, women were more likely than men to participate in symbolic activities designed to promote a sense of collegiality. They note that research suggests that women are likely to prioritize relationships established in personal settings and, as a result, behave in a collegial manner. However, Lawless et. al conclude that there is very little evidence suggesting that women and men behave differently in procedural voting. The evidence that Republican women’s procedural vote scores are more bipartisan than men’s holds in four of the 14 Congresses. They attribute the lack of gender difference in bipartisan procedural voting to increasing severity of polarization between the parties. This paper is relevant to my study in two ways. First, given that this paper suggests female legislators are more likely to behave in a collegial manner, it provides context for the assumption that I will observe collaborative female behavior. Second, I will expand on the lack of evidence of differences in bipartisanship by using cosponsorship, a measure of legislative collaboration that is less sensitive to polarization.

There is an extensive body of research that attempts to determine gender differences in legislative behavior and cooperation. However, these papers have largely
been focused on overall legislative effectiveness, or female collaboration under specific conditions. None have ventured to determine the overall effect of female representatives on bipartisan cosponsorship at the chamber level, a measurement of collaborative activity that I argue is stronger than roll-call or procedural voting. This paper seeks to build upon previous literature by using a revised measurement of collaboration, and extend findings on bipartisan cosponsorship to the House of Representatives at the chamber level.

III. Theory and Hypothesis

In this analysis I am interested in determining whether the increase in female legislators coincides with an increase in bipartisan cosponsorship. Specifically, I wonder if there an increase in the percent of cosponsors on a bill that are not from the original sponsor’s party as the number of women in the House of Representatives increases. Are women driving the change in bipartisan cosponsorship? I present two hypotheses and theories to answer this question.

Hypothesis I: As the overall number of female representatives increases, there will be an overall increase in bipartisan cosponsorship regardless of party.

Hypothesis II: There will be differences in the impact of female legislators on bipartisan cosponsorship when evaluated by party. Specifically:

a) Democratic bipartisan cosponsorship will be greater than Republican bipartisan cosponsorship
b) Democratic women are driving the increase in bipartisan cosponsorship.

I argue for my first hypothesis based on two components informed by previous studies – differences between males and females regarding frequency of cosponsorship and expectations of a collaborative nature. I have presented evidence that females who are elected to Congress outperform their male counterparts by cosponsoring more legislation on average (Anzia and Berry 2012, Paludi 2016). Because of the biases against female leaders, only those that are exceptional are elected to Congress. I theorize that this exceptional legislative behavior extends to cosponsorship across the board. As the number of women increases, I expect to see an overall increase in cosponsorship of all kinds, including bipartisan cosponsorship.

Additionally, I have presented previous literature that has found that females are more likely to participate in collaborative activities and are more collegial than their male counterparts. Women are likely to collaborate due to gendered socialization (Holman & Mahoney 2018), the tendency of females to establish deeper friendships with their colleagues (Lawless et. al 2016), and external pressure from constituents to compromise (Bauer et. al 2017). Therefore, I believe I will find gender differences in bipartisan cosponsorship over time regardless of party, since females collectively enter Congress with different behaviors and expectations than their male counterparts.

Although the literature that informs my first hypothesis is compelling, gender norms, cues and behaviors in a political context, like all norms cues and behaviors, rarely operate independent of the effects of other institutions (Reingold and Harrell 2010). While evidence suggests that female legislators as a whole operate in a way that is unique from male legislators as a whole, the reality of partisanship cannot be ignored or avoided.
It is for this reason that I propose a second hypothesis and theory regarding bipartisan cosponsorship in the context of party.

There is literature which suggests that, when evaluating the behavior of female representatives, party matters. I argue for my second hypothesis based on two key components: the party breakdown of female legislators in the House of Representatives and party differences in tolerance of collaborative female behavior. Regarding the first component, while the overall number of female representatives has steadily increased over the time period of this study, the breakdown of this increase has not been even by party. I discuss the breakdown of female representatives by party in the “Descriptive Statistics” section. Given that the number of Democratic women has risen significantly more than the number of Republican women, I expect to find that the increase in Democratic cosponsors on Republican bills will be greater than the increase Republican cosponsors on Democratic bills, simply because Democratic women have more opportunity to impact the outcome variable.

I also argue that Democratic women will engage in more bipartisan cosponsorship due to differences in party norms and environment. Osborn (2012) finds that Democratic control of the state legislative body is associated with promotion of a women’s agenda, while Republican control is not. This suggests that women are more free to behave in a way that is unconstrained by explicit partisan agenda under Democratic leadership.

Mahoney and Clark (2018) find evidence that women’s caucuses in state legislatures are more likely to form as the number of women increases if Democrats are in control of the legislature, but not when Republicans are in control. Caucuses are significant catalysts for collaboration in the legislative process, providing legislators with
information and an opportunity to express politically salient ideas (Hammond 1998). Women’s caucuses are additionally significant because they are an example of a truly bipartisan collaborative body, whereas members of Black, Latino and LGBT caucuses, for example, are almost always Democratic (Mahoney & Clark 2018). Given that female representatives are more likely create bipartisan collaborative bodies in a Democrat-controlled legislature, it is possible that Democratic leadership will allow for more female-driven bipartisan activity than Republican leadership. As a result, Republican women will be less likely to cosponsor Democratic bills, possibly out of fear of upsetting party leadership by deviating from the partisan agenda. This theory is furthered by previously discussed evidence suggesting that bipartisan cosponsorship can be a politically costly action that can lead to an unfavorable view in the eyes of party leadership (Holman and Mahoney 2018).

To determine what observations are driven by the differences between female and male legislators and what is the result of changes in political climate, it is essential that I control for other variables of interest. I outline my controls and considerations in the next section.
IV. Data Collection and Methodology

In this study, I use cosponsorship data from the U.S. House of Representatives from 1993 (beginning of the 103d Congress) to 2010 (end of the 111th Congress). I selected this start date because there is not a significant number of women in the U.S. House of Representatives (<10%) before this time. The cosponsorship data is available through the United States Congressional Database via Congress.gov. The specific dataset that I use was pulled and compiled into .CSV format by Dr. M. Daniele Paserman (Boston University). The data I received from Dr. Paserman was in two different files, one containing bill information and one containing cosponsorship information. The “Cosponsors” CSV file contained the name, state, district, term, party, and gender of every cosponsor on every House Bill from 1991-2011. The “Bills” CSV file contained, for each bill introduced in the previously specified time period, the sponsor’s name, state, district, term, party and gender.

I complete all of my data work and analysis using STATA. To convert the two datasets data into a single, workable dataset, I first collapse the “Cosponsors” dataset so that for each bill I can see the number of cosponsors, the number of cosponsors broken down by party, and the number of cosponsors broken down by gender. I then merge the collapsed “Cosponsors” dataset into the “Bills” dataset using a M:1 merge command in STATA. Next, I create the bipartisan cosponsorship percentages by party. To do this, I generate a variable called \textit{repbipart\_percent} that contained the number of Republican cosponsors divide by the total number of cosponsors multiplied by 100 if the original sponsor’s party was Democrat. I also generated a variable called \textit{dembipart\_percent} that contained the number of Democratic cosponsors divided by the total number of
cosponsors multiplied by 100 if the sponsor’s party was Republican. I combined these two variables into a variable called \textit{bipart\_percent}, which indicates the total percentage of sponsors that are not from the original sponsors’ party and includes both Democratic and Republican sponsors.

I choose to look at the percentage of cosponsors that are not of the sponsor’s party as opposed to raw numbers, as it allows for a more accurate understanding of the magnitude of bipartisan support. For example, a number of the bills with bipartisan cosponsorship have one bipartisan cosponsor, but that one bipartisan cosponsor is the only cosponsor on the bill. Therefore, the one cosponsor actually represents 100\% of the cosponsors on that bill. Alternative, one might argue that using percentage is misleading, since claiming that 100\% of the cosponsors are not of the sponsor’s party implies that the bill had a level of support beyond a seemingly insignificant single cosponsor. However, I argue that, given that over three quarters of bills do not have any bipartisan cosponsors, even having a single bipartisan cosponsor implies that the bill has a significant level of bipartisan support. The histogram of \textit{bipart\_percent} is presented in Figure 1.
Controls

The first variable that I control for is political polarization aggregated to the chamber level. The most commonly cited measure of polarization, and that which is used to control for political polarization in this study, is the DW-Nominate Index developed by McCarty, Poole and Rosenthal (1997). This model attributes a conservative score to legislators that vote with other conservatives, a liberal score with legislators that vote with other liberals, and a moderate score for those that vote with conservatives and liberals. An individual’s score is measured on liberal-conservative a scale from -1 to 1, with -1 indicating the liberal extreme, 1 indicating the conservative extreme, and zero or
close to zero indicating moderate. The scores for all legislators are aggregated by party to produce a mean polarization score for each party. A polarization score can then be attributed to each session of Congress by evaluating the mean difference in the mean score of each party. This mean chamber-level polarization score is what I will use to control for party polarization in this paper. The DW-Nominate Index indicates that political alignment of both parties has deviated towards the extreme over the time period of analysis. However, there are party differences in degree of polarization. The data on polarization in the House over time is displayed in Table 1.

Table 1: Political Polarization from the 103rd to 111th Congresses

(Source: Poole and Rosenthal, 2014)

<table>
<thead>
<tr>
<th>Congress</th>
<th>Year</th>
<th>Chamber Polarization Score</th>
<th>Mean Democratic Score</th>
<th>Mean Republican Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>103</td>
<td>1993</td>
<td>0.727</td>
<td>-0.318</td>
<td>0.409</td>
</tr>
<tr>
<td>104</td>
<td>1995</td>
<td>0.818</td>
<td>-0.343</td>
<td>0.475</td>
</tr>
<tr>
<td>105</td>
<td>1997</td>
<td>0.854</td>
<td>-0.351</td>
<td>0.503</td>
</tr>
<tr>
<td>106</td>
<td>1999</td>
<td>0.877</td>
<td>-0.35</td>
<td>0.527</td>
</tr>
<tr>
<td>107</td>
<td>2001</td>
<td>0.913</td>
<td>-0.355</td>
<td>0.558</td>
</tr>
<tr>
<td>108</td>
<td>2003</td>
<td>0.942</td>
<td>-0.354</td>
<td>0.588</td>
</tr>
<tr>
<td>109</td>
<td>2005</td>
<td>0.976</td>
<td>-0.364</td>
<td>0.612</td>
</tr>
<tr>
<td>110</td>
<td>2007</td>
<td>0.994</td>
<td>-0.347</td>
<td>0.647</td>
</tr>
<tr>
<td>111</td>
<td>2009</td>
<td>1.016</td>
<td>-0.335</td>
<td>0.681</td>
</tr>
</tbody>
</table>

The mean political polarization score for the Democrats during the 103rd Congress was -.318 on the liberal-conservative spectrum, with positive indicating conservative voting behavior and negative indicating liberal voting behavior. The mean score for the Republicans on the same spectrum was .409. During the 111th Congress, the
Democratic and Republican political polarization scores were -.335 and .681, respectively. This indicates that while both the Democratic and Republican parties in the House have become more polarized, the Republican party has become more polarized than the Democratic party in the same time period.

I control for polarization in this study because I expect that the increased polarization over the time period of this study could be a rival explanation for bipartisan cosponsorship activity. I would expect that as the views of the members of each political party deviate from moderate, the members would be less likely to cosponsor legislation introduced by the other party. Because of this polarization, I would expect an overall decrease in bipartisan cosponsorship over time independent of gender composition. This effect would work counter to the effect of the increase in bipartisan cosponsorship that I expect as a result of an increase in female representatives. Therefore, I must control for polarization to ensure that the effect of women on bipartisanship is not driven out by the effects of political polarization.

I also consider which party is the majority party in the House of Representatives during each session of Congress. I do so using a dummy variable called \textit{democratic majority} that equals one if the Democrats are the majority party in the House and equals zero if the Republicans are the majority party in the House. A summary of the House majority party for the years of this study is presented in Table 2.
Table 2: Majority Party in the House of Representatives from the 103rd to 111th Congresses

(Source: United States House of Representatives Archives)

<table>
<thead>
<tr>
<th>Congress</th>
<th>Year</th>
<th>Majority Party</th>
</tr>
</thead>
<tbody>
<tr>
<td>103</td>
<td>1993</td>
<td>Democrat</td>
</tr>
<tr>
<td>104</td>
<td>1995</td>
<td>Republican</td>
</tr>
<tr>
<td>105</td>
<td>1997</td>
<td>Republican</td>
</tr>
<tr>
<td>106</td>
<td>1999</td>
<td>Republican</td>
</tr>
<tr>
<td>107</td>
<td>2001</td>
<td>Republican</td>
</tr>
<tr>
<td>108</td>
<td>2003</td>
<td>Republican</td>
</tr>
<tr>
<td>109</td>
<td>2005</td>
<td>Republican</td>
</tr>
<tr>
<td>110</td>
<td>2007</td>
<td>Democrat</td>
</tr>
<tr>
<td>111</td>
<td>2009</td>
<td>Democrat</td>
</tr>
</tbody>
</table>

I include this control because the majority party yields significant responsibility that sets the tone for what will be accomplished during that session of Congress. Traditionally the Speaker of the House is a member of the majority party. The Speaker has profound influence on legislation and procedures in the House, and is responsible for ensuring that the legislation that is supported by the majority party is passed in the House. Additionally, the House majority party has the ability to assert influence over committee assignments and leadership. Krehbiel (1993) notes that by and large the partisan distribution of committees is roughly the same as the partisan distribution of the chamber overall. Aldrich and Rohde (1998) note that the majority party has significant influence over the assignment of committee leadership. Given that the majority party wields such
significant influence over the legislative process in the House of Representatives, I would expect that majority party would be closely related to my outcome variable.

Additionally, as discussed in the “Theory” section, party influences the likelihood of collaborative efforts amongst female representatives (Osborn 2012; Clark and Mahoney 2018). This applies not only to looking at which party leadership will allow for more bipartisan efforts within their own party, but also for determining which chamber leadership will allow for more overall bipartisan efforts.

I do find a statistically significant correlation between party in power and overall bipartisan cosponsorship, as well as cosponsorship broken down by party. The results between democratic majority and the three dependent variables are displayed in Table 3.

*Table 3: Correlation between Democratic Majority and Bipartisan Cosponsorship*

<table>
<thead>
<tr>
<th>Democratic Majority</th>
<th>rho</th>
<th>p</th>
<th>count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Republican Bipartisan Cosponsorship</td>
<td>0.798</td>
<td>0.000</td>
<td>18</td>
</tr>
<tr>
<td>Democratic Bipartisan Cosponsorship</td>
<td>-0.760</td>
<td>0.000</td>
<td>18</td>
</tr>
<tr>
<td>Bipartisan Cosponsorship</td>
<td>-0.643</td>
<td>0.004</td>
<td>18</td>
</tr>
</tbody>
</table>

I observe that Democratic control is associated with a decrease in Democratic cosponsorship on Republican-sponsored bills. This is what I would expect, since the party with legislative control is not forced to compromise as often to accomplish legislative goals. Similarly, Democratic control is associated with an increase in Republican cosponsorship of Democratic-sponsored bills, which I would also expect.
since the minority party has little choice but to increase cooperation when it does not have control of the legislative agenda. I also find that Democratic power is associated with a net decrease in overall bipartisan cosponsorship, although this correlation is less strong than the bipartisan cosponsorship correlations by party.

V. Descriptive Statistics

*Female Representatives*

From 1993 to 2011, the number of women in the House of Representatives increased from 29, or 6.67% of all representatives, to 79, or 18.16%. However, this increase did not occur evenly between Democrats and Republicans. In this time period, the number of Democratic female representatives increased from 16 to 62, while the number of Republican female representatives increased from 13 to 17, peaking at 25 in the 109th Congress. The breakdown of number of female House representatives is displayed in Figure 2.
Bipartisan Cosponsorship

In order to assess the changes in bipartisan cosponsorship over time as the number of women in the House increases, I must obtain the mean percentage of bills with bipartisan cosponsorship for each session of Congress. I do so by collapsing the variables `repbipart_percent`, `dembipart_percent` and `bipart_percent` by the Congress in which the bill was introduced. The mean percentages of overall bipartisan cosponsorship from the 103rd to the 111th Congresses are displayed in Figure 3.
I find that the percentage of cosponsors on a given bill that are not from the original sponsor’s party increases from the 103rd to 108th Congresses, and that it steadily decreases during the 109th through 111th Congresses. The initial increase aligns with my first hypothesis that bipartisan cosponsorship increases over time; the subsequent decrease, however, does not support my hypothesis. This drop is particularly interesting because it corresponds with the most significant increase in the number of Democratic women during the time period of this study, from 46 females during the 109th Congress to 62 females during the 111th.
Bipartisan Cosponsorship by party

As previously discussed, although the overall number of female representatives in the House increased from 1993 to 2010, the increase was primarily driven by the Democrats. To understand bipartisan collaboration in the context of party I first break down bipartisan cosponsorship by party. The results are presented in Figure 4.

Figure 4: Bipartisan Cosponsorship by Party from the 103rd to 111th Congresses
(Source: Congress.gov)

Throughout the timeline, the mean percentage of Democratic cosponsors on Republican bills is never lower than the mean percentage of Republican cosponsors on Democratic bills. When averaged across the nine sessions of Congress, the overall mean percentage of Republican cosponsors on Democratic bills (13.98%) is lower than that of
Democratic cosponsors on Republican bills (22.77%). This trend is consistent with Hypothesis II, since there is overall more Democratic bipartisan cosponsorship than Republican bipartisan cosponsorship.

In Figure 4, I find that there is a steady increase in the percentage of Democratic cosponsors on Republican-sponsored bills until the 109th Congress, when a significant drop occurs. This is a similar trend to that of the overall percentage of bipartisan cosponsorship over time, and is again not what I expected given the large jump in the number of Democratic female representatives during this time period. However, for the percentage of Republican cosponsors on bills with Democratic sponsors, the opposite occurs. The percentage decreases steadily from the 101st to 109th Congresses, then peaks during the 110th Congress. Interestingly, this spike in Republican bipartisan cosponsorship corresponds with a decline in the Republican female representatives, from 25 in the 109th Congress to 17 in the 111th Congress.

**VI. OLS Regression**

I have highlighted that the descriptive data of bipartisan cosponsorship and female representatives do not align with Hypothesis I, but are more consistent with Hypothesis II. To determine if there is a statistically significant relationship between female politicians in the House of Representatives and bipartisan cosponsorship, I use an Ordinary Least Squares (OLS) regression to estimate the parameters of a few models. In
the OLS models I collapse the data by year rather than by Congress, as this maximizes
the number of observations that I am working with. It is important to note that, given the
limited number of observations, I am unable to account for all of the variables that I
would ideally control for. With this in mind, I specify a few unique models with different
combinations of variables of interest\(^1\).

**Test of Hypothesis I**

I first estimate the following equation:

\[
P = a + \beta_o Z + \beta_1 female + \epsilon
\]

in which \(P\) is the percentage of cosponsors on a bill that are not from the original
sponsor's party; \(Z\) is the control vector accounting for chamber-level polarization\(^2\) and
year\(^3\); \(\beta_o\) is the coefficient on the \(Z\) vector; \(female\) is the raw number of female
representatives and \(\beta_1\) is the coefficient on the \(female\) variable; and \(\epsilon\) is an error term. I
also run the same model a second time, substituting \(year\) for a dummy representing
Democratic Majority. I choose to omit \(year\) in this model because it is highly correlated
with polarization (correlation of .9731 and statistically significant). Therefore, since I
keep the \(polarization\) variable throughout the models, it is not imperative that I include
year\(^4\). Again, due to the limited number of observations I was advised to limit the number
of variables in the multivariate analysis, but my analysis would not be as robust without
controlling for both polarization and party in power in some way. The results are

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\(^1\) Models were completed in consultation with Dr. Catherine Zimmer of the Odum Institute at the
University of North Carolina.

\(^2\) The polarization variable is multiplied by 100 in this regression analysis to determine the impact of
increasing the polarization score by .01 rather than 1.

\(^3\) It should be noted that I include year as a continuous variable in this model. In this way I account roughly
for the impact of time from the start to end of the study, but do not have the isolated independent effect of
each year. Given the data that I have, this was the best way that I could account for change over time.

\(^4\) I ran the same model using \(democratic\) majority and \(year\), and the results were nearly identical.
presented in Table 4

Table 4: regression model on chamber bipartisan cosponsorship

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Model 1</th>
<th>Model 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bipartisan Cosponsorship</td>
<td>Bipartisan Cosponsorship</td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>-0.212</td>
<td>-0.087</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.131</td>
<td>-0.319</td>
<td></td>
</tr>
<tr>
<td>Democratic Majority</td>
<td>—</td>
<td>-2.397</td>
<td></td>
</tr>
<tr>
<td></td>
<td>—</td>
<td>-2.544</td>
<td></td>
</tr>
<tr>
<td>Year</td>
<td>-0.697</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.459</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Polarization</td>
<td>-.623***</td>
<td>-0.901</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.176</td>
<td>-0.356</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>1,370.66</td>
<td>16.797</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-899.656</td>
<td>-13.189</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>18</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>R-squared</td>
<td>0.441</td>
<td>0.417</td>
<td></td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses

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

In model 1, the coefficient on the females variable is negative and significant at the 13% level. Since the p-value is relatively high, the statistical significance of this finding is relatively low. Therefore, there is insufficient evidence to conclude that the overall number of women in the House increases the overall percentage of bipartisan cosponsorship and I therefore fail to reject the null hypothesis. The model also suggests that for every .01 increase chamber in polarization score, bipartisan cosponsorship
decreases by .623%. This finding is expected: as the ideology of representatives from both parties veers to the extreme, it makes sense that they would be less likely to support legislation from the opposite party.

In model 2, once I substitute in the control for democratic majority, none of the variables are statistically significant. This suggests that the party in power is the most significant explanatory variable regarding bipartisan cosponsorship. The number of women in the House is not as significant a determinant of overall bipartisan cosponsorship. Again, this does not provide any support for Hypothesis I.

From the findings in models 1 and 2, there is insufficient evidence to conclude that simply increasing the overall number of women in the House will directly increase overall bipartisan cosponsorship. However, this is not to say that increasing female representation is not important for increasing bipartisan collaboration. Since numerous studies (Osborn 2012, Mahoney and Clark 2018) have noted that party matters when determining the collaborative behavior of female representatives, the next step is to isolate the effect of increasing the number of Democratic women and the number of Republican women separately.

**Test of Hypothesis II – Democratic Women**

I first test Hypothesis II by isolating the effect of an increase in Democratic women only. I test this effect on both Democratic cosponsorship of Republican-sponsored bills and Republican cosponsorship of Democratic-sponsored bills. I test using polarization and year in models 3 and 4, and using polarization and democratic majority in models 5 and 6. The results are presented in Table 5.
Table 5: regression model on bipartisan cosponsorship accounting for change in Democratic women

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Democratic Bipartisan Cosponsorship</th>
<th>Republican Bipartisan Cosponsorship</th>
<th>Democratic Bipartisan Cosponsorship</th>
<th>Republican Bipartisan Cosponsorship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Democratic Females</td>
<td>-0.479**</td>
<td>0.353***</td>
<td>-0.079</td>
<td>-0.093</td>
</tr>
<tr>
<td>Year</td>
<td>-0.214</td>
<td>-0.109</td>
<td>-0.459</td>
<td>-0.171</td>
</tr>
<tr>
<td>Democratic Majority</td>
<td>—</td>
<td>—</td>
<td>-6.548</td>
<td>4.513***</td>
</tr>
<tr>
<td>Polarization</td>
<td>-.972**</td>
<td>-0.209</td>
<td>-.446</td>
<td>-.292</td>
</tr>
<tr>
<td>Constant</td>
<td>1,933.58</td>
<td>472.509</td>
<td>20.386</td>
<td>13.890**</td>
</tr>
<tr>
<td>Observations</td>
<td>18</td>
<td>18</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.546</td>
<td>0.554</td>
<td>0.58</td>
<td>0.684</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses

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

In models 3 and 4, the coefficient on the *democratic females* variable is statistically significant, indicating that Democratic women are having an influence on bipartisan cosponsorship.

Although model 3 indicates that the number of female Democrats is related to bipartisan cosponsorship, it directly contradicts Hypothesis II. Instead, this finding indicates that increasing the number of Democratic females decreases Democratic
bipartisan cosponsorship. I wondered if this was due to the possibility that once the number of women passes a certain threshold, women no longer feel the need to act in a more cooperative manner. This idea is based on the finding in Holman and Mahoney (2018) that female collaboration in state legislatures is curvilinear in nature. They argue that once the number of women passes a maximum threshold and surpases token status, collaboration becomes too costly and will decline. To test this, I ran the previously specified model adding a females squared variable. The results are presented in Table 6.
Table 6: regression model on bipartisan cosponsorship accounting for females squared

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Model 3a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Democratic Females</td>
<td>1.379</td>
</tr>
<tr>
<td>Democratic Females Squared</td>
<td>-0.018*</td>
</tr>
<tr>
<td>Polarization</td>
<td>-.891**</td>
</tr>
<tr>
<td>Year</td>
<td>-1.13</td>
</tr>
<tr>
<td>Constant</td>
<td>2,178.80</td>
</tr>
<tr>
<td></td>
<td>-1,488.02</td>
</tr>
<tr>
<td>Observations</td>
<td>18</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.628</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses

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

In model 3a once the democratic females squared variable is added, the coefficient on the democratic females variable becomes positive and statistically significant at the 14% level. The coefficient on the democratic females squared variable is negative and statistically significant at the 6% level. This implies that an increase in female representatives leads to a decrease in bipartisan cosponsorship once the proportion
of females becomes too high. This is consistent with the idea of a maximum threshold presented in Holman and Mahoney (2018).

The results of model 4 are interesting because they imply that an increase in female Democrats causes an increase in Republican bipartisan cosponsorship. I believe this finding actually does fit into my theory, when considered carefully. It is possible that not only are Democratic women driving bipartisanship by reaching across the aisle to cosponsor Republican legislation, perhaps they are making a concerted effort to recruit Republican sponsors onto Democratic legislation. This fits into Hypothesis II because it suggests that Democratic women are driving bipartisanship. It is possible that the Republican leadership is more tolerant of bipartisan efforts when it is not their female representatives driving the effort.

The lack of significance of the *female* variable in models 5 and 6 seems to indicate that party in power is the most significant explanatory variable for Democratic bipartisan cosponsorship. Once it is accounted for, the presence of female representatives becomes a weak indicator. In model 6, the coefficient on the *democratic majority* variable is positive and highly statistically significant. This means that when Democrats have control of the House, Republicans represent a higher percentage of cosponsors on Democratic bills. All of these findings reinforce that gender cannot be looked at independent of party when assessing bipartisan cosponsorship efforts. Democratic women are impacting bipartisan cosponsorship, but to look at this effect independently of partisanship results in an incomplete picture.

*Test of Hypothesis II – Republican Women*

I next evaluate the the isolated effect of increasing the number of Republican
women on Republican cosponsorship of Democratic bills and on Democratic cosponsorship of Republican bills. I test using *polarization* and *year* in models 7 and 8, and using *polarization* and *democratic majority* in models 9 and 10. The results are presented in Table 7.

*Table 7: regression model on bipartisan cosponsorship accounting for change in Republican women*

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Model 7</th>
<th>Model 8</th>
<th>Model 9</th>
<th>Model 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Republican</td>
<td>Bipartisan</td>
<td>Democratic</td>
<td>Republican</td>
<td>Democratic</td>
</tr>
<tr>
<td>Bipartisan</td>
<td>Cosponsorship</td>
<td>Cosponsorship</td>
<td>Cosponsorship</td>
<td>Cosponsorship</td>
</tr>
<tr>
<td>Republican</td>
<td>Bipartisan</td>
<td>Democratic</td>
<td>Republican</td>
<td>Democratic</td>
</tr>
<tr>
<td>Females</td>
<td>-0.28</td>
<td>0.294</td>
<td>0.034</td>
<td>-0.074</td>
</tr>
<tr>
<td></td>
<td>-0.194</td>
<td>-0.452</td>
<td>-0.213</td>
<td>-0.419</td>
</tr>
<tr>
<td>Year</td>
<td>0.580*</td>
<td>-2.175**</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>-0.28</td>
<td>-0.929</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Polarization</td>
<td>-0.289*</td>
<td>-0.116*</td>
<td>-0.575</td>
<td>-0.404</td>
</tr>
<tr>
<td></td>
<td>-0.16</td>
<td>-0.583</td>
<td>-0.801</td>
<td>-0.138</td>
</tr>
<tr>
<td>Democratic</td>
<td>Majorities</td>
<td>—</td>
<td>3.722***</td>
<td>-7.553***</td>
</tr>
<tr>
<td>Majority</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Constant</td>
<td>-1,114.918*</td>
<td>4,265.057**</td>
<td>17.222***</td>
<td>22.578***</td>
</tr>
<tr>
<td></td>
<td>-547.985</td>
<td>-1,813.06</td>
<td>-4.06</td>
<td>-6.997</td>
</tr>
<tr>
<td>Observations</td>
<td>18</td>
<td>18</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.346</td>
<td>0.453</td>
<td>0.678</td>
<td>0.58</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses

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

Across all four models, the coefficient on the *republican females* variable is not statistically significant. This finding is consistent with Hypothesis II, since the isolated
effect of Republican women on both Republican and Democratic bipartisan cosponsorship is not significant. I believe this finding is related to the overall small number of Republican women – it is possible that this group does not have a profound effect on bipartisan cosponsorship simply because their numbers are not high enough to cause significant change. This finding is also consistent with the theory that Republican leadership is less willing to allow female collaborative behavior.

In models 7 and 8, polarization has a statistically significant negative effect on bipartisan cosponsorship, as expected. In model 9, the coefficient on democratic majority is positive and highly significant, and in model 10 it is negative and highly significant. This again indicates that party in power has a huge influence on bipartisan cosponsorship. When the Democrats are in control, Republican cosponsorship on Democratic bills increases and Democratic cosponsorship of Republican bills decreases. With this set of parameters, party lines is the primary factor determining bipartisan collaborative efforts.

VII. Conclusion

In this paper I have evaluated what effect female representatives have on bipartisan cosponsorship. I find that the most significant predictor of bipartisan cosponsorship is party affiliation in relation to party in power – if you are in the majority party you do not have to reach across the aisle, and if you are in the minority party you will. This holds true regardless of the representative’s gender.
When majority party is stripped away, however, the effect of women on bipartisan cosponsorship begins to emerge. While number of Republican women seems to have no significant effect on bipartisan cosponsorship, Democratic women do seem to be a driving factor. My data suggests that Democratic bipartisan cosponsorship increases as number of women increases until a maximum threshold is reached, at which point bipartisan efforts begin to decrease.

This project could be improved with more data. Unfortunately, the statistical power of the models presented is limited because of the small sample size. A larger sample size would also allow me to run a singular model with all of the controls incorporated instead of having to run separate models with different parameter specifications. It would be very interesting to repeat this study using data through the 2018 midterm election and beyond to future years in which, hopefully, the House of Representatives will more closely resemble the demographics of the United States.

Even if presence of women is not the sole, or even the most significant, factor driving bipartisan efforts, there are many arguments to be made for electing more women to office. Female legislators are more likely than their male colleagues to think of themselves as representing women and to consider females an important constituent group (Reingold 1992). High levels of female descriptive representation – that is females being represented by other females – leads to higher levels of efficacy for female citizens (Atkeson and Carillo 2007). Therefore female representation plays an important role in our democratic society by encouraging participation and trust in government. Finally, most simply put, electing strong female leaders breaks down long held societal norms about who can be a leader and which characteristics leaders exemplify.
VIII. References


