

# PI SIGMA ALPHA

UNDERGRADUATE JOURNAL OF POLITICS

ΠΣΑ

The Pi Sigma Alpha Undergraduate Journal of Politics (ISSN 1556-2034) is published biannually by the Sigma Upsilon Chapter of Pi Sigma Alpha, Elon University, Department of Political Science, 100 Campus Drive, Gray Pavilion, 2333 Campus Box, Elon, NC 27244. The Journal is funded by Pi Sigma Alpha, the National Political Science Honor Society, 1527 New Hampshire Avenue, NW, Washington, DC 20036, <http://www.pisigmaalpha.org/>

The Pi Sigma Alpha Undergraduate Journal of Politics was founded in the Spring of 2001 by Delta Omega Chapter of Pi Sigma Alpha at Purdue University, under the name The American Undergraduate Journal of Politics and Government. With the sponsorship of Pi Sigma Alpha, the National Political Science Honor Society, the name of the Journal was changed to The Pi Sigma Alpha Undergraduate Journal of Politics as of the Fall 2004 edition.

Electronic editions of the Journal are available online at <http://www.psjournal.org>. For further information, please contact Dr. Laura Roselle at Elon University ([lroselle@elon.edu](mailto:lroselle@elon.edu)).

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# The Pi Sigma Alpha Undergraduate Journal of Politics

Spring 2021

Volume XXI

Number 1

Forty-Second Edition

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# Editor's Preface to the Spring Edition

Here at Elon University, we are extremely grateful for the opportunity to host the *Pi Sigma Alpha Undergraduate Journal of Politics* for the coming years. We are proud to present the Spring 2021 issue, and congratulate all authors published in this issue.

This journal seeks to highlight the intellectual curiosity that has led to innovative scholarship in all subfields of political science, scholarship that addresses timely questions, is carefully crafted, and utilizes diverse methodologies. We are committed to intellectual integrity, a fair and objective review process, and a high standard of scholarship. Through this publication, we aim to accentuate student achievements in political science research and showcase the works of undergraduate scholars, some of which has been traditionally ignored in the broader field of political science literature, despite representing the future of this discipline.

As an editorial team composed entirely of women, we understand that this occurrence is not a common one. Following the lead of the all-female American Political Science Review (APSR) Editorial Board, we are excited to promote research in the areas of “American politics, comparative politics, international relations, political theory, public law and policy, racial and ethnic politics, the politics of gender and sexuality and qualitative and quantitative research methods.” This journal values the relationships formed through student-faculty collaboration and aims to inspire a culture of intellectual curiosity that expands far beyond the college campus. In addition to recognizing the academic endeavors of undergraduate students, we hope to further encourage and empower students to seek out knowledge and realize their potential in contributing to growing scholarship in a variety of disciplines.

In the journal's first year, we want to emphasize our appreciation for all the individuals who have made this first publication possible. Our advisors, Dr. Laura Roselle, Dr. Baris Kesgin, and Dr. Aaron Sparks, have been unwavering in their support of us throughout this entire process. Without their consistent support and insights, this issue would not have been possible. In addition, we would like to thank the entirety of the Political Science and Policy Studies Department at Elon University, as well as our Faculty Advisory Editorial Board reviewers for all of their hard work and support.

Going forward, we are excited to create a culture within our Editorial Board that embraces these values and continues to strive for excellence for the remainder of the journal's tenure at Elon University. Thank you for your continued support and readership of our publication, we hope you enjoy our first edition.

Sincerely,

*The Editorial Board at Elon University*

# Submission of Manuscripts

The Journal accepts manuscripts from undergraduates of any class and major. Members of Pi Sigma Alpha are especially encouraged to enter their work. We strive to publish papers of the highest quality in all areas of political science.

Generally, selected manuscripts have been well-written works with a fully developed thesis and strong argumentation stemming from original analysis. Authors may be asked to revise their work before being accepted for publication.

Submission deadlines are October 1st for the Fall edition and February 1st for the Spring edition. Manuscripts are accepted on a rolling basis; therefore early submissions are strongly encouraged.

To submit your work, please email [psajournalelon@gmail.com](mailto:psajournalelon@gmail.com) with an attached Word document of the manuscript. Please include your name, university and contact details (mailing address, email address, and phone number) in a separate document.

Submitted manuscripts must include a short abstract (approximately 150 words), citations, and references that follow the *APSA Style Manual for Political Science*. Please do not exceed the maximum page length of 35 double-spaced pages, which includes references, tables, figures, and appendices.

The Journal is a student-run enterprise with editors and an Editorial Board that are undergraduate students and Pi Sigma Alpha members at Elon University.

The Editorial Board relies heavily on the help of our Faculty Advisory Board consisting of political science faculty from across the nation, including members of the Pi Sigma Alpha Executive Council. Due to the time committed to the manuscript review process, we would like to remind students to submit only one manuscript at a time.

Please direct any questions about submissions or the Journal's upcoming editions to the editors at Elon University: [psajournalelon@gmail.com](mailto:psajournalelon@gmail.com).

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# Divided We Stand: Political Polarization and Original Co-Sponsorship in the U.S. Senate

Audrey Payne, Texas Christian University

*Political polarization has become a central topic of discussion for observers of United States politics in recent decades. Over the past fifty years, political scientists have observed a steady increase in polarization, especially among members of the United States Congress. Many studies claim that this phenomenon has caused factors in Congress such as divisive rollcall voting and legislative gridlock. However, some studies neglect to analyze its indirect, long-term effects on legislative productivity and cooperation on the formulation of legislation in Congress. In an effort to address these issues, this paper begins by discussing the standard perspectives of polarization and its impacts on the legislative branch. It then looks at legislative norms and the tradition of co-sponsorship as a baseline of congressional cooperation. Next, it gathers original co-sponsorship and party affiliation data from three sessions of the Senate from 1991 to 2016 to analyze the prevalence of co-sponsorship and to test whether a growth in polarization affects original co-sponsorship levels within a twenty-five-year period. The essay then concludes by suggesting that an increase in polarization does cause a change in co-sponsorship trends, showing divisiveness through an increase in single-party co-sponsored legislation. However, bills that are co-sponsored across party lines are more likely to pass through the Senate than bills without bipartisan support during these periods, so senators may be able to overcome legislative gridlock through seeking original bipartisan cosponsors.*

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## INTRODUCTION

On June 2, 2019, Republican Senator John Kennedy of Louisiana addressed his Democratic peers in an interview on the CBS news segment *Face the Nation*. He asserted that the House of Representatives must make a firm decision about whether or not to move forward with the impeachment of President Donald Trump. Senator Kennedy dared the Democrats in the House of Representatives to “go hard or go home,” telling them that they needed to “go to Amazon” and “buy a spine” if they wanted to impeach the president (Zhao 2019). This instance of a member of Congress verbally challenging his peers in a news interview is just one of many examples of the effects of modern political polarization. Polarization appears to have significant impacts on modern political life. From accusatory language between political elites to shifts in roll-call voting behavior to legislative gridlock, polarization has been an influential factor in several facets of government and politics, especially in Congress. In order to realize the definite impacts of polarization on congressional productivity, this question becomes crucial: *What is the impact of polarization on the level of cooperation in public policymaking?*

In Previous studies on partisan polarization indicate that deep ideological divisions have steadily increased in Congress over the past fifty years. Although there is debate in the literature about whether or not this steady increase in the ideological divide among members of Congress is reflected in the electorate,

the prominence of polarization has led to significant trends in voting behavior among members of Congress. Over time, ideological divisions have become more consistently correlated with the roll-call voting patterns of Republican and Democratic members of Congress. Research indicates that polarization may be a contributing factor to phenomena such as divisive roll-call voting, legislative gridlock, decreasing amounts of legislation that passes, and limited abilities of members of Congress to be cordial and cooperate with one another (Desilver 2019; Jones 2001; Poole and Rosenthal 2001).

This study explores the effects of an increase in political polarization on legislative behavior of members of Congress by focusing on its impact on the levels of cross-party cooperation. This article conducts its research by analyzing bills and resolutions introduced on the floor of the Senate in three distinct congressional sessions to determine if the instance of bipartisan co-sponsorship decreases with heightened polarization. The data demonstrates that, while the number of bipartisan co-sponsored pieces of legislation does not significantly change across congressional sessions, the number of single-sponsored pieces of legislation decreases and the number of within-party co-sponsored pieces of legislation increases as polarization rises. Furthermore, the higher the level of bipartisan co-sponsorship on a piece of legislation, the more likely the legislation will pass through the Senate. Discovering the answers to these questions aids in determining whether the institutional norms that form the basis of congressional

functions have been broken down by polarization and suggests means by which members of Congress can overcome the hindering effects of polarization.

This research paper first discusses the phenomenon of political polarization, the trends of polarization in Congress, and how polarization impacts legislative productivity and cooperation in the Senate in particular. Then, this paper gathers data on sponsorship, co-sponsorship, and party affiliations in the Senate across three congressional periods. Finally, this article compares the three congressional periods to analyze the impact of polarization on legislative productivity and cooperation in the Senate, as well as discover the impact of bipartisan co-sponsorship on the passage of legislation.

## **POLARIZATION AS A POLITICAL PHENOMENON**

Polarization is a political phenomenon that occurs when two groups become increasingly ideologically distant from each other. In the case of United States politics, polarization manifests when the existing political parties ideologically separate from each other and elected officials increasingly sort themselves along party lines. One study suggests that elected officials in the United States “appear to represent relatively extreme support coalitions” in periods of polarization (Poole and Rosenthal 1984, 1061). When this occurs, the preferences of the overall constituencies of the elected officials may not be well-represented, especially if the official is elected to represent a group of people that have more moderate ideological preferences and voting behaviors.

Political scientists frequently debate about whether the electorate in the United States is as deeply polarized as their elected officials. Some argue that, due to factors such as an increase in the ability of the electorate to obtain secondary education and the growing ideological conflict among political elites, the electorate has become increasingly and more deeply divided by polarization (Abramowitz and Saunders 2008, 542). Others argue that the electorate is much less consistently or deeply divided and that distributions of policy views among the electorate have not significantly changed over the past few decades (Fiorina, Abrams, and Pope 2008) (Fiorina 2014). However, these researchers do agree that polarization is becoming a steadily increasing phenomenon among political officials. According to some studies, polarization among political elites has been increasing in the United States and is more polarized now than it has been in the past fifty years (Poole and Rosenthal 2001; Fiorina, Abrams, and Pope 2008). One of the facets of American politics where polarization is the most evident is in the United States legislative branch—Congress.

### **Trends of Polarization in Congress**

Research indicates that Congress has grown steadily more polarized since the 1980s (Farina 2015, 1701). Congress is increasingly split along the liberal-conservative ideological

divide that is coming to define the platforms of the Democratic and Republican political parties. This ideological divide impacts how members of Congress vote and the productivity levels of the legislatures themselves. One study found that the liberal-conservative ideological divide accounted for 93 percent of roll-call voting choices that were not unanimous in the 109th House and Senate (Poole and Rosenthal 2007, 106). Some researchers created a more specific definition of polarization to fit the narrative that is present in Congress: “the average distance between preferences of the median Democratic and Republican members” (Farina 2015, 1693). This **chart** from Voteview.com (**Figure 1**) depicts the difference between party means in each chamber of Congress over time, which is a frequently used measure of polarization. The difference of party means in the Senate and the House of Representatives increased starting around 1970 and sharply increased after the early 1990s, proving that polarization has risen in Congress (Lewis 2018).

There are several trends in Congress that impact partisan conflict and ideological polarization. Researcher Cynthia Farina describes three criteria that indicate polarization in Congress (2015, 1694). The first observation, ideological coherence, occurs when the two major political parties become more ideologically consistent across a variety of political issues. The second observation, partisan sorting, occurs when members become sorted by party. The last observation, ideological divergence, occurs when the distance between median party preferences significantly increases. Over the past few decades, Congress has fulfilled all three observations described by Farina (2015, 1694).

Roll-call voting behavior is one of the most frequently analyzed measures of partisan splits and ideological divergence in Congress. One study showed that the nature of party control has a “stronger direct effect” on a member of Congress’s roll-call voting behavior than any other variable (Bullock III and Brady 1983, 37). However, polarization affects more than just roll-call voting behavior in Congress, and those implications may affect other norms and behaviors of the legislative branch.

### **Implications of Congressional Polarization**

According to research, political polarization may contribute to issues with legislative productivity. One study found that in both the Senate and the House of Representatives, when neither political party is close to having a veto-proof majority, highly polarized parties are the most likely to cause legislative gridlock (Jones 2001, 129). This may lead to a decrease in the number of significant bills that the legislature is able to successfully pass and turn into law. Although recent Congresses have been able to pass more legislation than the 112th Congress, which enacted a record-low 284 bills, a recent study by the Pew Research Center revealed that the proportion of ceremonial to substantive legislation has increased, suggesting that Congress is not increasing legislative productivity levels when it comes to passing substantive

Figure 1: Difference between party means in each chamber of Congress over time



Source: Voteview.com

legislation (Desilver 2019). One study stated that the existence of high levels of polarization in Congress while public opinion seeks a reasonable compromise “raises essential questions about the ability of institutions to represent voters and function properly” (La Raja and Schaffner 2015, 95).

Furthermore, polarization may impede on the ability of members of Congress to cooperate with one another, including reaching compromises or engaging in vote trading, such as logrolling. Despite the fact that members of the House and Senate are expected to follow the norms of the legislature, including establishing friendly relationships with their peers, polarization may contribute to a breakdown of these institutional norms. One study in 1973 asked non-freshman members of the House of Representatives for their opinions about the importance of a variety of congressional norms. Ninety-seven percent of non-freshman representatives agreed that friendly relationships are important, the highest level of agreement of all the norms in the study (Asher 1973, 501). However, with increasing levels of partisan division in Congress, it is possible that the tradition of friendly relationships may diminish with the increase of polarization. As the political parties become more ideologically separated, some researchers claim that “opportunities for coalition building appear to have disappeared” (Farina 2015, 1699). The public rhetoric has already become meaner spirited, making it increasingly difficult for members of Congress to build and maintain friendships.

### Co-sponsorship and Polarization

One facet of congressional behavior that may be impacted by polarization is the tradition of sponsorship and co-sponsorship of bills. A sponsor is “a senator who introduces a bill or resolution in the Senate” and a cosponsor is any other senator whose name appears on the bill after the sponsor’s name is listed (Oleszek 2018, 1).

As one of the many traditions of Congress, the act of cosponsoring a bill contributes to the maintaining of friendly relationships that is deemed crucial to members of the House and the Senate. Co-sponsorship is “generally understood to signify a Senator’s support for the proposal” (Oleszek 2018, 2). Members of Congress view co-sponsorship as a means of demonstrating the level of support among peers for the bill or resolution (Oleszek 2018, 2). By contacting their peers through a letter or soliciting them in person, senators can advocate for their bill or resolution in an effort to increase support for the legislation and, hopefully, increase the likelihood that their bill or resolution will pass through the Senate.

Ideology affects the positions members of Congress take on issues and bills and can affect a senator’s choice about whether or not to cosponsor a bill. According to a study, senators are more likely to cosponsor bills if their political views differ from the Senate median and are closer to the views of the bill’s sponsor (Harward and Moffett 2011, 117). However, if the bill is ideologically distant from a senator’s views, he/she becomes much less likely to sign his/her name as a cosponsor on

the bill. According to the study, ideologically extreme senators may tend to cosponsor bills more often than less ideologically extreme senators because they “want to take clearly defined positions that differ from the status quo and move the status quo toward their own preferences” (Harward and Moffett 2011, 132). These ideologically extreme senators are more likely to support a bill that is distant from the ideological median to make a political statement, gain media attention, and shape public discourse to focus on their issue of interest.

Like many other areas of cooperation in Congress, polarization may impact the ability of members of Congress to convince other members to serve as a cosponsor on their bills and resolutions. However, the observations stated above imply conflicting impacts of polarization on co-sponsorship. Because polarization in Congress indicates an increase in the distance of median ideological preferences between Democratic and Republican members of Congress (Farina 2015, 1693), polarization may cause a decrease in the number of bills that are co-sponsored across party lines because senators are not likely to sponsor bills and resolutions that are ideologically distant from their views. However, because polarization indicates an increase in ideological extremism on both sides of the political spectrum, it is possible that the number of instances of co-sponsorship along party lines increase as members of Congress become more polarized. In addition, co-sponsorship may also be a potential solution to polarization’s negative effects on Congress. If a bill is able to receive bipartisan support and cross-party co-sponsorships despite the fact that the two political parties are distant from each other in Congress, it may be able to overcome the legislative gridlock effects of polarization and pass through the Senate. If this is the case, co-sponsorship may be a potential answer to Congress’s concerns about the negative implications of polarization on legislative productivity. However, it is important to note that the Senate is only one chamber of Congress. Studying the Senate alone may technically be an imperfect study of Congress as a whole. However, characteristics of the Senate make it a more effective choice for capturing the effect of polarization on co-sponsorship. For instance, since the Senate has far fewer members than the House of Representatives, it is more likely that senators will establish deeper relationships with opposing party members than in the House. Furthermore, the Senate has a reputation of maintaining a more collegial environment than the House, which will hopefully provide more information about trends of cooperation. Finally, the higher likelihood that members of the House of Representatives can find many like-minded cosponsors might mean that they are less likely to reach across the aisle to extend their list of cosponsors. All of these make the Senate the best fit chamber to study.

This information implies three testable hypotheses:

*H1. The higher the level of polarization in the Senate, the fewer the number of cross-party co-sponsored pieces of legislation that will be introduced in the Senate.*

*H2. The higher the level of polarization in the Senate, the more likely a cross-party co-sponsored piece of legislation will pass through the Senate.*

*H3. The higher the level of bipartisan co-sponsorship on a piece of legislation, the more likely that piece of legislation will pass through the Senate.*

The rest of this article tests these hypotheses by examining Senate bills and amendments from three congressional periods and comparing the output and rates of passage of the legislation generated.

## RESEARCH DESIGN

In order to statistically examine the impact of polarization on cross-party co-sponsorship in the United States Senate, this article gathers cross-sectional data for the 1991-1992 congressional session (the 102nd Congress), the 2007-2008 congressional session (the 110th Congress), and the 2015-2016 congressional session (the 114th Congress) in order to compare the three time periods. The bill is the unit of analysis. Each data point represents a piece of legislation in a given congressional session.

This paper collects data for the 4,245 pieces of legislation that were introduced in the Senate during the 102nd congressional session, the 4,623 pieces of legislation that were introduced in the Senate during the 110th congressional session, and the 4,289 pieces of legislation that were introduced in the Senate during the 114th congressional session. These pieces of legislation include bills, Senate resolutions, concurrent resolutions, and joint resolutions. These congressional sessions are included in this paper because the three Congresses each represent progressively higher and higher polarization rates over the years, according to the information from Voteview.com depicting differences in political party means (Lewis 2018). The 102nd Congress occurred before the trend of rapidly increasing polarization began, so it serves as a baseline to compare across differing levels of polarization.

The 102nd, 110th, and the 114th Congresses are included in this paper because they occur during instances of divided government (in these two cases, the president’s political party is different from the majority party in the Senate). This article works with three divided government Senates because unified governments may face fewer consequences of polarization. Since unified governments have the ability to pass legislation with zero bipartisan support, there may be fewer instances of bipartisan sponsorship under those circumstances, which would likely hinder the relevance of the data collected. Furthermore, these congressional sessions occur during the last two years of the incumbent president’s term in office, which hopefully accounts for any changes in senator behavior that might occur in different parts of a presidential term. Additionally, this paper works with 110th and 114th congressional sessions because the evidence will reveal whether

the short-term effects of an increase in polarization on the Senate in ten years or less has affected Senate action. Finally, the 102nd Congress serves as a baseline, providing the opportunity to compare the effects of polarization across the ten-year time span between the 110th and 114th Congresses to the effects of increasing polarization across a longer time period of twenty-five years. However, it is important to note that the party in power and the voting differential may affect co-sponsorship levels in the three sessions. The 102nd Congress, for instance, shifted from a 56 to 58-member Democratic majority. The 110th Congress shifted between a 50 to 51-member Democratic majority, while the 114th Congress shifted from a 54 to 52-member Republican majority. Further research is required to determine the effects of Republican or Democratic control in the Senate on co-sponsorship levels, as well as determining if the strength of partisan control affects co-sponsorship levels. The data analysis includes all introduced bills and amendments from the three congressional periods.

This paper only collects data for original cosponsors. Original cosponsors are involved in the original discussion and formulation of the bill, which represents the levels of cooperation this article intends to measure. Senators that become cosponsors after the bill has been introduced may choose to add their names to make a political statement or other ulterior motives that would hinder the relevance of the information collected.

### **Outcome Variables: Output and Passage Rates of Co-Sponsored Legislation**

This paper uses data on legislative output, instances of co-sponsorship, and latest actions on legislation from the official Legislation Record of the United States Congress, accessed through [www.congress.gov](http://www.congress.gov). Legislation is defined in this study as any bill, act, or amendment to a previous bill that is introduced to the Senate, either to a committee or on the Senate floor. The data set recorded by the Legislation Record of the United States Congress is ideal because it codes valuable information about each piece of legislation. The data include the name and political party affiliation of the original sponsor of the introduced legislation,<sup>1</sup> the number of cosponsors and their party affiliations,<sup>2</sup> and a list of all Senate actions on the legislation, including the latest recorded action. This paper incorporates the data from the Congressional Bills Project, accessed through <http://www.congressionalbills.org/research.html>, into the research. This data set includes an organized list of each piece of legislation from the 93rd to the 114th Congress. The data set documents each piece of legislation's bill ID, whether or not the bill passed through the House and Senate, the type of legislation, the name and party identification of the original sponsor, and more.<sup>3</sup>

Each piece of legislation is sorted into one of three categories - single-sponsored, co-sponsored within a single political party, or co-sponsored across party lines. This paper then records the number of cosponsors for each piece of

legislation, marks whether or not the legislation passed through the Senate, and marks whether or not the legislation passed through both chambers of Congress.<sup>4</sup> Next, the paper calculates the percentage of the total pieces of legislation that fit into each of the three co-sponsorship categories, the percentage of legislation from each category that passed through the Senate,<sup>5</sup> and the percentage that did not pass through either chamber. Finally, the paper calculates the percentage of the total pieces of legislation that are not co-sponsored, single-co-sponsored, and co-sponsored by multiple senators and the passage rates of each.

### **Methodological Approach**

This paper measures and analyzes the data by comparing the percentages collected from the 102nd Congress, the 110th Congress, and the 114th Congress. Tests of statistical significance are used to determine the passage rates of cross-party co-sponsored bills compared to single-party co-sponsored bills and single sponsored bills within a single Congress. In addition, tests of statistical significance help compare the passage rates of cross-party and single-party co-sponsored bills between the three Congresses. Tests of statistical significance also helped to determine the differences among levels of bipartisan co-sponsorship between the three congressional sessions. Doing these tests reveal if the number of instances of cross-party co-sponsorship increased or decreased with increasing polarization. Finally, this paper assesses whether the legislation co-sponsored across party lines is statistically more effective and more likely to pass through the Senate during times of heightened polarization.<sup>6</sup>

### **ANALYSIS**

The research addresses three hypotheses, including predictions that the higher the level of polarization in the Senate, the fewer the number of cross-party co-sponsored bills will be introduced, but the more likely those bills that have higher levels of cross-party co-sponsorship will pass through the Senate. The hypotheses predict a decrease in the percentage of bills that are co-sponsored across party lines from the 102nd to the 114th congressional sessions and a higher passage rate among bills with bipartisan cosponsors than those without.

### **Co-Sponsorship Across Congressional Sessions**

In order to determine if co-sponsorship impacts the passage of legislation during periods of polarization in Congress, the data must confirm that the 114th Senate was more polarized than the 110th and that the 110th Senate was more polarized than the 102nd. Reviewing Figure 1 (page 34) which depicts the difference between party means in each chamber of Congress over time, demonstrates that polarization increased in the Senate between the 102nd and 114th Congress (Lewis 2018).

The results from the initial organization of the co-sponsorship data reveal that the majority of bills and

resolutions passed across the three congressional sessions have either a single author with no co-sponsors or one original co-sponsor in addition to the author of the bill. From there, the number of original co-sponsors per piece of legislation greatly decreases. An additional figure to examine in the initial data is the frequency of instances in which the original co-sponsors are members of the opposite political party from the sponsor of the bill. 39.47 percent of all bills introduced in the Senate across the three congressional sessions have at least one bipartisan cosponsor, which is, as expected, much lower than the frequency of original cosponsors in general, which encompasses 62.82 percent of all bills.

One of the key results is the significance of the relationship between the types of original co-sponsorship and the likelihood that a bill passes through the Senate. The independent variables include single-sponsored, sponsored within party lines, and sponsored across party lines (labeled Single, Within, and Across respectively). Establishing the baseline for the strength of the relationships between these variables and the likelihood of a bill passing through the Senate helps determine if these relationships strengthen or weaken

during periods of heightened polarization in the Senate. Below are three tables documenting the total number of bills in the 102nd, 110th, and 114th senatorial sessions that fit each category and the relationships between the variables and the passage rates of those bills through the Senate.

All three relationships are statistically significant – single-sponsored and within-party co-sponsored bills have a negative relationship with bill passage. Although these inverse relationships are technically statistically significant, it is likely they are guaranteed statistical significance because of the large sample size of 13,157 bills. These are relatively weak relationships, since their Cramer’s V tests both fall short of reaching -0.2. However, the Cramer’s V for cross-party co-sponsored bills is 0.2490, demonstrating a moderately strong relationship. This suggests that cross-party co-sponsorship increases the likelihood of Senate passage compared to the other types of co-sponsorship. However, these relationships may vary across the 102nd, 110th, and 114th Senates. Employing comparative analysis between the three congressional sessions will help determine if the presence of increasing polarization impacts the strength of

	Did Not Pass Senate	Passed Senate	Total
Bills With at Least One Co-Sponsor	6,477 (78.37%)	1,788 (21.23%)	8,265 (100.00%)
Single-Sponsored	4,420 (90.35%)	472 (9.65%)	4,892 (100.00%)
Total	10,897 (82.82%)	2,260 (17.18%)	13,157 (100.00%)
Pearson chi2(1) = 310.2745 Pr = 0.000 Cramer's V = -0.1536			

	Did Not Pass Senate	Passed Senate	Total
Bills Not Within-Party Co-Sponsored	8,117 (80.49%)	1,968 (19.51%)	10,085 (100.00%)
Within-Party Co-Sponsored	2,780 (90.49%)	292 (9.51%)	3,072 (100.00%)
Total	10,897 (82.82%)	2,260 (17.18%)	13,157 (100.00%)
Pearson chi2(1) = 165.8109 Pr = 0.000 Cramer's V = -0.1123			

	Did Not Pass Senate	Passed Senate	Total
Bills Not Across-Party Co-Sponsored	7,200 (90.41%)	764 (9.59%)	7,964 (100.00%)
Across-Party Co-Sponsored	3,697 (71.19%)	1,496 (28.81%)	5,193 (100.00%)
Total	10,897 (82.82%)	2,260 (17.18%)	13,157 (100.00%)
Pearson chi2(1) = 815.7643 Pr = 0.000 Cramer's V = 0.2490			

the relationships between single sponsorship, within-party co-sponsorship, across-party co-sponsorship, and bill passage.

### Co-Sponsorship and Polarization Between Congresses

As previously discussed, the Senates of the 102nd, 110th, and 114th congressional sessions faced increasing levels of polarization over time (Lewis 2018). Comparatively analyzing the data among the three congressional sessions will reveal how the increasing polarization affects the levels of original co-sponsorship. The table below demonstrates that there is a statistically significant difference in the total number of cosponsors between the 102nd, 110th, and 114th Senates. Moreover, there are more instances of total co-sponsorship in the 114th Senate than in the 110th Senate and in the 110th Senate than in the 102nd, but the table does not reveal which type of co-sponsorship each co-sponsor falls under. Are there more across-party cosponsors in the 110th and 114th Senates than in the 102nd, or is the increase in co-sponsorship caused by an increase of within-party cosponsors?

Table 5 clarifies the type of original co-sponsorship that caused the changes described in Table 4. Table 5 reveals that there is a statistically significant decrease in the instances of bipartisan co-sponsorship between the 110th and the 114th Senates. This means that the increase in overall original co-sponsorship in the 114th Congress likely comes from an increase in within-party co-sponsorship. However, the 102nd Senate has fewer instances of bipartisan co-sponsorship, despite the fact that it has a lower level of polarization than either of the two other Senate sessions. What does this mean for how significantly the number of bills in each type changed between congressional sessions?

Running tabulations will help determine the significance

of the changes in each type of co-sponsorship between the three congressional sessions. The tabulations yielded surprising results. Hypothesis H1 predicts that the higher the level of polarization, the fewer the number of cross-party co-sponsored bills will be introduced in the Senate. According to Table 8, the percentage of cross-party co-sponsored bills did decrease from 44.4 percent to 41.7 percent between the 110th and the 114th Senates, but the percentage of cross-party co-sponsored bills increased from 31.9 percent to 44.4 percent between the 102nd and 114th Senates. While the 110th and 114th Senates appear to confirm the hypothesis, the low frequency of bipartisan co-sponsored bills in the 102nd Senate results in a rejection of the hypothesis. Polarization does not cause a significant change in the percentage of legislation introduced within a congressional session that has original bipartisan cosponsors.

Although H1 is unsupported by the data, the findings in Tables 6 and 7 may help provide an alternative explanation for the decline in bipartisan co-sponsorship as Congress becomes increasingly more polarized. Table 6 shows that the number of single-sponsored bills did not follow the anticipated increase. Rather, over 50 percent of the bills and resolutions introduced on the Senate floor during the 102nd Congress had no original cosponsors.<sup>7</sup> In fact, the number of bills without any original cosponsors decreased from 50.7 percent in the 102nd Senate to 33 percent in the 110th Senate and 28.4 percent in the 114th Senate. In addition, the percentage of legislation that is within-party co-sponsored steadily increases across the three congressional sessions. Table 7 shows that 17.5 percent of the legislation introduced in the 102nd Senate is co-sponsored solely by senators within the sponsor's own party, while 22.7 percent of the 110th Senate's legislation and 29.9 of the 114th Senate's legislation falls in

Congress	Average Sponsorship
102 (4245 obs)	0.73
110 (4623 obs)	0.89
114 (4289 obs)	0.96
Chi2(2) = 30.0538 Prob>chi2 = 0.000	

Congress	Average Sponsorship by Other Party
102 (4245 obs)	1.11
110 (4623 obs)	1.22
114 (4289 obs)	1.09
Chi2(2) = 27.9410 Prob>chi2 = 0.000	

Table 6. Single-Sponsorship Between Congresses

	102nd Congress	110th Congress	114th Congress	Total
Bills Not Single-Sponsored	2,095 (49.35%)	3,099 (67.03%)	3,071 (71.60%)	8,265 (62.82%)
Single-Sponsored	2,150 (50.65%)	1,524 (32.97%)	1,218 (28.40%)	4,892 (37.18%)
Total	4,245 (100.00%)	4,623 (100.00%)	4,289 (100.00%)	13,157 (100.00%)

Pearson chi2(1) = 506.4207 Pr = 0.000 Cramer's V = 0.1962

Table 7. Within-Party Co-Sponsorship Between Congresses

	102nd Congress	110th Congress	114th Congress	Total
Bills Not Within-Party Co-Sponsored	3,502 (82.50%)	3,575 (77.33%)	3,008 (70.13%)	10,085 (76.65%)
Within-Party Co-Sponsored	743 (17.50%)	1,048 (22.67%)	1,281 (29.87%)	3,072 (23.35%)
Total	4,245 (100.00%)	4,623 (100.00%)	4,289 (100.00%)	13,157 (100.00%)

Pearson chi2(1) = 184.0718 Pr = 0.000 Cramer's V = 0.1183

Table 8. Cross-Party Co-Sponsorship Between Congresses

	102nd Congress	110th Congress	114th Congress	Total
Bills Not Across-Party Co-Sponsored	2,893 (68.15%)	2,572 (55.63%)	2,499 (58.27%)	7,964 (60.53%)
Across-Party Co-Sponsored	1,352 (31.85%)	2,051 (44.37%)	1,790 (41.73%)	5,193 (39.47%)
Total	4,245 (100.00%)	4,623 (100.00%)	4,289 (100.00%)	13,157 (100.00%)

Pearson chi2(1) = 158.7654 Pr = 0.000 Cramer's V = 0.1098

that category. Together, these percentages could mean that as Congress becomes increasingly more polarized, senators are more likely to adopt formal co-sponsorship relationships with people in their own political party. The senators may choose to prove their bill's attractiveness to their party by seeking original cosponsors for their bill instead of introducing it to the Senate without any cosponsors. This alternative explanation aligns with a possible explanation mentioned earlier in the paper.

**Co-Sponsorship and Legislative Outcomes**

Finally, the relationships between co-sponsorship and legislative outcomes by congressional session must be observed in order to determine how polarization impacts legislative output. Below are several tables that depict the relationship between the types of co-sponsored bills and their legislative outcomes, divided by Congress. Each set of three tables

depicts the relationships from the 102nd Senate first, the 110th Senate second, and the relationships from the 114th Senate third.

Tables 9, 10, and 11 depict the change in the relationship between single-sponsored bills and passage in the Senate. In all three Congresses, single-sponsored bills are less likely to pass through the Senate.

Tables 12, 13, and 14 depict the relationship between within-party co-sponsorship and bill passage in the Senate. The figures depict a modest, but statistically significant relationship between within-party co-sponsorship and passing through the Senate in the 102nd Congress. The strength of this negative correlation decreases by about .04 between the 102nd and 110th Congress, but then increases by almost .1 between the 110th and 114th Congress. This means that bills that lacked bipartisan cosponsors became less likely to pass through the Senate during the 114th congressional session.

Table 9. Single Sponsorship and Bill Passage in the 102nd Congress			
	Did Not Pass Senate	Passed Senate	Total
Bills Not Single-Sponsored	1,595 (46.25%)	500 (62.81%)	2,095 (67.03%)
Single-Sponsored	1,854 (53.75%)	296 (37.19%)	2,150 (32.97%)
Total	3,449 (100.00%)	796 (100.00%)	4,245 (100.00%)
Pearson chi2(1) = 71.0301 Pr = 0.000 Cramer's V = -0.1294			

Table 10. Single Sponsorship and Bill Passage in the 110th Congress			
Did Not Pass Senate	Passed Senate	Total	Total
Bills Not Single-Sponsored	2,407 (63.06%)	692 (85.86%)	3,099 (67.03%)
Single-Sponsored	1,410 (36.94%)	114 (14.14%)	1,524 (32.97%)
Total	3,817 (100.00%)	806 (100.00%)	4,623 (100.00%)
Pearson chi2(1) = 156.4931 Pr = 0.000 Cramer's V = -0.1840			

Table 11. Single Sponsorship and Bill Passage in the 114th Congress			
Did Not Pass Senate	Passed Senate	Total	Total
Bills Not Single-Sponsored	2,475 (68.16%)	596 (90.58%)	3,071 (71.60%)
Single-Sponsored	1,156 (31.84%)	62 (9.42%)	1,218 (28.40%)
Total	3,361 (100.00%)	658 (100.00%)	4,289 (100.00%)
Pearson chi2(1) = 137.6379 Pr = 0.000 Cramer's V = -0.1791			

Table 12. Within-Party Co-Sponsorship and Bill Passage in the 102nd Congress			
Did Not Pass Senate	Passed Senate	Total	Total
Bills Not Single-Sponsored	2,782 (80.66%)	720 (90.45%)	3,502 (67.03%)
Single-Sponsored	667 (19.34%)	76 (9.55%)	743 (17.50%)
Total	3,449 (100.00%)	796 (100.00%)	4,245 (100.00%)
Pearson chi2(1) = 42.9389 Pr = 0.000 Cramer's V = -0.1006			

The relationship between cross-party co-sponsorship and passing through the Senate is shown in Tables 15, 16 and 17. Table 15 reveals that the relationship between cross-party co-sponsorship and passing through the Senate in the 102nd Senate is a statistically significant relationship. Unlike

the other two variables, cross-party co-sponsorship has a moderately strong correlation with Senate passage. Tables 16 and 17 reveal that the strength of this correlation increases from 0.22 in the 102nd Senate, to 0.23 in the 110th Senate, to 0.3141 in the 114th Senate. Over the course of twenty-five

years (1991 to 2016), the percentage bills that passed through the Senate falling into the bipartisan co-sponsored category increased from 53.3 percent to 78.1 percent, which is a 24.8 percent increase. This does not necessarily prove hypothesis

H2, which claims that the higher the level of polarization in the Senate, the more likely an individual piece of legislation with bipartisan cosponsors will pass through the Senate. However, it does suggest that having bipartisan cosponsors is

Table 13. Within-Party Co-Sponsorship and Bill Passage in the 110th Congress

Did Not Pass Senate	Passed Senate	Total	Total
Bills Not Within-Party Co-Sponsored	2,903 (76.05%)	672 (83.37%)	3,575 (77.33%)
Within-Party Co-Sponsored	914 (23.95%)	134 (16.63%)	1,048 (22.67%)
Total	3,817 (100.00%)	806 (100.00%)	4,623 (100.00%)

Pearson chi2(1) = 20.3418 Pr = 0.000 Cramer's V = -0.0663

Table 14. Within-Party Co-Sponsorship and Bill Passage in the 114th Congress.

	Did Not Pass Senate	Passed Senate	Total
Bills Not Within-Party Co-Sponsored	2,432 (66.98%)	576 (87.54%)	3,008 (70.13%)
Within-Party Co-Sponsored	1,199 (33.02%)	82 (12.46%)	1,281 (29.87%)
Total	3,631 (100.00%)	658 (100.00%)	4,289 (100.00%)

Pearson chi2(1) = 112.4071 Pr = 0.000 Cramer's V = -0.1619

Table 15. Cross-Party Co-Sponsorship and Bill Passage in the 102nd Congress

	Did Not Pass Senate	Passed Senate	Total
Bills Not Cross-Party Co-Sponsored	2,521 (73.09%)	372 (46.73%)	2,893 (68.15%)
Cross-Party Co-Sponsored	928 (26.91%)	424 (53.27%)	1,352 (31.85%)
Total	3,449 (100.00%)	796 (100.00%)	4,245 (100.00%)

Pearson chi2(1) = 207.0375 Pr = 0.000 Cramer's V = 0.2208

Table 16. Cross-Party Co-Sponsorship and Bill Passage in the 110th Congress

Did Not Pass Senate	Passed Senate	Total	Total
Bills Not Cross-Party Co-Sponsored	2,324 (60.89%)	248 (30.77%)	2,572 (55.63%)
Cross-Party Co-Sponsored	1,493 (39.11%)	558 (69.23%)	2,051 (44.37%)
Total	3,817 (100.00%)	806 (100.00%)	4,623 (100.00%)

Pearson chi2(1) = 244.5385 Pr = 0.000 Cramer's V = 0.2300

Did Not Pass Senate	Passed Senate	Total	Total
Bills Not Cross-Party Co-Sponsored	2,355 (64.86%)	144 (21.88%)	2,499 (58.27%)
Cross-Party Co-Sponsored	1,276 (35.14%)	514 (78.12%)	1,790 (41.73%)
Total	3,631 (100.00%)	658 (100.00%)	4,289 (100.00%)

Pearson chi2(1) = 423.0520 Pr = 0.000 Cramer's V = 0.3141

increasingly important in order to move legislation through the Senate. Some might argue that this data does not prove that cooperation before introducing legislation on the Senate floor overcomes polarization, but that the only bills that can pass through the Senate are those that gain bipartisan support. However, since these pieces of legislation in the data are coded with original cosponsors, rather than including senators who sign their name after the bill has been introduced on the floor, the idea that these bills are only being passed through bargaining or political compromise in order to move legislation through the Senate is rejected. These are bills that have legitimate cooperation between parties at the outset. Therefore, it is possible that it is more likely these bills with legitimate cooperation have a better chance of passing when polarization is high. The research can still allow for the conclusion that cooperation at the basic level of drafting legislation can be an effective strategy to overcome the challenges of gridlock introduced by heightened levels of polarization.

In order to check this claim from another perspective, this paper observes the correlation between number of cross-party original cosponsors for each bill and passage rates in the Senate. By observing this correlation, this paper can determine

if the relationship stated above holds true. Tables 18 and 19 below show the correlation between number of cosponsors, number of bipartisan cosponsors, and bill passage by Congress. There is an increase in the correlation between the number of bipartisan cosponsors and passage through the Senate from 0.19 to 0.24 between the 102nd and 110th Congresses and an increase to 0.30 in the 114th Congress. Tables 18 and 19 confirm hypothesis H3, which suggests that the higher the level of bipartisan co-sponsorship on a piece of legislation, the more likely the piece of legislation will pass through the Senate. In both tables, the number of bipartisan cosponsors shows a modest and statistically significant correlation with passage through the Senate, and this correlation only increases as the Senate becomes more polarized.

According to the results of this analysis, H1 is unsupported, H2 requires further study, and H3 is supported. All three hypotheses have statistically significant results. Although the data did not provide the expected results for H1, there is a possibility that the data provides an alternate explanation for how polarization affects how many bills and resolutions fall into each co-sponsorship category. Even if an increase in polarization does not directly cause a decrease in

Congress	Correlation with Passage
102nd Congress	0.16
110th Congress	0.22
114th Congress	0.24

Congress	Correlation with Passage
102nd Congress	0.19
110th Congress	0.24
114th Congress	0.30

the number of bills that have original bipartisan cosponsors, senators might be abandoning informal bipartisan negotiation processes that take place after a bill has been introduced on the floor, choosing instead to seek within-party cosponsors to encourage their partisan colleagues to adopt their legislation in a more formalized competition. H2 shows that a moderate level of correlation between bipartisan cosponsors and bill passage increases over the twenty-five-year timespan the data encapsulates. Finally, H3 shows a statistically significant correlation between the level of bipartisan co-sponsorship and bill passage.

## CONCLUSION

This paper aims to examine the impact of polarization on legislative productivity and levels of cooperation among members of Congress. In order to explore these issues, this paper collected sponsorship and co-sponsorship data for each piece of legislation introduced on the Senate floor in the 102nd, 110th, and 114th senatorial sessions. The paper then compared single-sponsored, within-party co-sponsored, and cross-party co-sponsored bills to examine if the type of co-sponsorship impacted the ability of legislation to pass through the Senate, as well as if the number of bills in each category shifted as Congress became more polarized.

Hypothesis H2 revealed an important relationship between co-sponsorship and bill passage and hypothesis H3 is confirmed. As the level of polarization increases in the Senate, the number of cross-party co-sponsored pieces of legislation that are introduced in the Senate are not necessarily affected. However, the number of single-sponsored pieces of legislation decreases and the number of within-party co-sponsored pieces of legislation increases as polarization rises. This discovery reveals that senators are more likely to cooperate with senators of their own political party on the formulation of legislation when Congress is increasingly polarized. However, the data also shows that the higher the level of polarization in the Senate, the more likely bills that are passed have bipartisan cosponsors. Furthermore, the higher the level of bipartisan co-sponsorship on a piece of legislation, the more likely the legislation will pass through the Senate. These discoveries reveal a potential solution to the issue of legislative productivity. Senators may be able to overcome the decline in bill passage by finding enough original bipartisan cosponsors to encourage parties from both sides to consider their legislation. This becomes even more prevalent with the realization that these conclusions are established by merely counting bills in three different Senates. Not all bills are equally important when it comes to public policy, so statistical analysis cannot fully capture the significance of this issue. If only a few major bills are fostered to success through cross-party cooperation, those bills could make a crucial difference in the productivity of a congressional session.

This paper provides an introduction to the method of employing co-sponsorship as a measure of legislative

productivity during periods of polarization in Congress. However, there are several factors that may impact the results of this data. For instance, this paper covered legislation in the Senate within a twenty-five-year timeframe, but it only covered data in three congressional sessions. A potential topic for further study could be to study co-sponsorship and collect data for more congressional sessions within this timeframe. In addition, this research paper includes every piece of legislation that was introduced on the floor of the Senate during the 102nd, 110th, and 114th Congresses, including bills that are ceremonial in nature (such as naming a federal building after a former president, etc.). It is possible that removing ceremonial bills from the equation and solely focusing on bills that impact public policy may impact the data. An additional note to consider is the possibility that other branches of government may impact the behavior of senators and whether or not they choose to cosponsor a bill. For instance, if a president belongs to the majority political party and disapproves of a bill, will that make the senators in his same political party less likely to cosponsor the bill? Does the president's opinion of a bill limit the chance of a bill to receive bipartisan support? Furthermore, do senators that share a political party with the president cosponsor bills more often than senators of the opposite political party? A similar issue may also occur with majority and minority leaders. If senators are considering cosponsoring a bill sponsored by a member of the opposite party, might they be discouraged to cosponsor if their party leader in the Senate disapproves of it? In addition, further research is needed to determine whether the co-sponsorship behavior of an individual senator can skew the data. If a single senator cosponsors hundreds of bills as a personal or political choice, can that affect the ability to compare congressional sessions? Finally, this paper only covers co-sponsorship in the Senate. Would a House of Representatives study yield entirely different results, or would it show an even stronger correlation among the variables?

This research paper provides a new approach to analyzing the impact of polarization that focuses on long-term cooperation and legislative productivity rather than the directly impacted voting patterns. Furthermore, the results of this paper reveal a potential solution to the inhibitions placed on policymaking by the development of polarization in Congress, because polarization breaks down the behavioral traditions in the Senate, cooperation and peaceful communication with other legislators appear to be on the decline. However, if legislators realize that bills are more likely to pass through a polarized legislative body with greater numbers of original bipartisan cosponsors, they might be encouraged to overcome the pressures of polarization and cooperate with one another to achieve their policymaking goals in Congress. ■

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## NOTES

- 1 The senators that label themselves as "independent" or "independent Democrat" (Senators Sanders, Lieberman, and King) are labeled Democrats in the data because they caucused with the Democratic Party during the elections pertaining to the time period of the data collection.
- 2 Even if an original cosponsor later withdrew his or her name from the bill, his or her name is included in the data collection because the measure of levels of cooperation in Congress used in this article is the number of instances of original co-sponsorship.
- 3 Senator Arlen Specter was a declared Republican during the 102nd and 110th congressional sessions and later switched his identification to Democrat after the 110th congressional session ended. He is listed as a Republican whenever he sponsored or co-sponsored a bill in the 110th congressional session because the Republican Party was his party of identification at the time.
- 4 Any piece of legislation that initially passed through both chambers of Congress is included in the "passed both chambers" category, even if one of the chambers later passed a motion to reconsider the legislation.
- 5 If a piece of legislation passed through the Senate with a preamble or amendment added, the legislation is included in the "passed through the Senate" category.
- 6 The research leaves out analysis regarding the relationships between the different types of co-sponsorship and passage through the House of Representatives. The House is an independent legislative body with different rules and processes from the Senate, which may skew the data if included in an analysis designed for the Senate's structures and processes in mind.
- 7 Part of the high frequency of single-sponsored bills can be explained by efforts made by President George H.W. Bush and Senator John McCain to broaden the president's rescission power. On March 20th, 1992, Senator McCain proposed 68 separate bills attempting to allow President Bush to remove individual pork barrel projects from appropriations bills under the Budget and Impoundment Act. The bills were ruled out of order and never voted on. On April 9th, 1992, Senator McCain introduced an additional 25 bills to approve the president's new rescission proposals. However, these 93 bills alone are not sufficient to account for the frequency of single-sponsored bills introduced in the 102nd Senate.