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"The primary threat: How the surge of ideological challengers is exacerbating partisan polarization"

Richard Barton $\textcircled{\tiny{ID}}$
Cornell University, Ithaca, NY, USA

Abstract
Despite widespread speculation among pundits and politicians, statistical research finds little evidence that primaries are an important source of polarization in roll call voting. This manuscript moves beyond roll call votes by testing the effects of ideological primary challenges on partisanship in bill co-sponsorship in Congress. Moreover, while extant research generally focuses on the one-to-one effects of primary challenges on the incumbents who experience a challenge, I measure and test the effects of the mere threat of a primary challenge from the ideological extreme. I find that the increased threat of an ideological primary challenge accounts about one-fourth of the rise in partisanship that occurred from the 1980s to the 2010s. These findings suggest the recent wave of ideological primary challenges is an important source of the escalation and intensification of polarization in recent Congresses.

Contrary to the intuition of many people who work on Capitol Hill,[1] the conventional wisdom among political scientists is that primaries are *not* a significant determinant of polarization. The literature provides a litany of evidence that party leaders and members initiate polarization for ideological (Krehbiel, 1995; Poole and Rosenthal, 2007) and strategic reasons (Aldrich and Rohde, 2000; Cox and McCubbins, 1993, 2005; Lee, 2016; Sinclair, 2006; Theriault and Rohde, 2011; Theriault, 2013). Moreover, quantitative studies on roll call voting consistently fail to find a statistically significant effect of primaries on polarization (Ansolabehere et al., 2001; Boatright, 2013; Hirano, 2010; McGhee et al., 2014), or only modest and conditional effects (Bullock and Clinton, 2011; Jewitt and Treul, 2019).

This manuscript advances the literature on primaries and polarization by moving beyond roll call votes, and instead tests the effects of ideological primary challenges on an original dataset of bill co-sponsorship. If primary challenges incentivize members to be more partisan, the effect should be more evident during this earlier stage of the legislative process, in which rank-and-file members have considerably greater discretion, and more opportunities to support bipartisan bills (Harbridge, 2015).

Using an original measure of bipartisan bill co-sponsorship, I demonstrate that polarization in this earlier stage of the legislative process has increased dramatically in recent Congresses. During the 1980s, on average, Republicans cosponsored with Democrats and fellow Republican at nearly equal rates, and Democrats cosponsored with about one Republican for every two Democratic cosponsors. From the 1980s to the 2010s, bipartisan co-sponsorship declined by about 50 percent in both parties, and much of this decrease occurred relatively recently, during the presidency of Barack Obama. Although polarization in roll call voting has gradually increased since the mid-20th century, these data on bill co-sponsorship reveal a relatively sharp and recent escalation in partisan polarization among rank-and-file members. This rise in partisan bill co-sponsorship reflects the erosion of bipartisan relationships and legislative coalitions, and ultimately results in gridlock and "unorthodox policymaking," since bills that pass through the traditional legislative process generally require broad, bipartisan support (Curry and Lee, 2019; Sinclair, 2012).

This manuscript also provides a second set of conceptual and methodological innovations. Although extant research focuses on the one-to-one effects of primary challenges on the incumbents who experience a challenge, I theorize that incumbents pre-emptively respond to the mere threat of a primary challenge from the ideological extreme. I develop a two-stage model to test the effects of the threat of an ideological primary challenge. In the first stage, I use chamber- and district-level data to model the vote share received by ideological challengers in a given primary election. The coefficients from these models, and the same chamber- and district-level data, are then used to predict the vote share of ideological challengers for each incumbent in a given Congress. The predicted vote share of challengers from the ideological extreme is used as a proxy for the perceived threat of an ideological primary challenge. In the second stage, partisan bill co-sponsorship is regressed on the predicted vote share of ideologically extreme candidates.

In the first section of analysis, I find that incumbents who undergo an ideological primary challenge decrease the rate at which they cosponsor bills with members of the other party. In the subsequent section, I find that the increased *threat* of an ideological primary challenge accounts for about one-fourth of the increase in partisan bill co-sponsorship, among both Republicans and Democrats, from the 1980s to the 2010s. These findings suggest that the recent wave of ideological primary challenges is a highly important source of the recent escalation and intensification of partisan polarization.

Primaries and polarization

Existing research finds that primary voters are more ideologically extreme than their less engaged co-partisans (Jacobson, 2012), that they prefer more ideologically extreme candidates (Brady et al., 2007), and that extreme candidates perform better in primary elections (Hall, 2015; Hall and Snyder, 2015). However, evidence of extreme preferences among primary voters does not necessarily indicate that primary challenges have an independent effect on polarization in Congress. In fact, the reoccurring statistical finding is that primaries do *not* contribute to polarization in any significant way.

A number of studies provide compelling evidence that primary rules and procedures are not an important source of polarization (Bullock and Clinton, 2011; Hirano, 2010; McGhee et al., 2014), and these findings are consonant with the emergent UCLA School on parties, which developed around the premise that coalitions of policy demanders (Bawn et al., 2012; Cohen et al., 2008) or extended party networks (Desmarais et al., 2015; Hassell, 2016; Koger et al., 2009, 2018; Masket, 2009, 2016) responded to democratizing primary reforms by coordinating to preserve their control over the nomination process. Moreover, statistical research finds no relationship between competitive primary challenges and legislative behavior (Ansolabehere et al., 2001; Hirano, 2010). These earlier studies problematically assume that all primary challenges should have polarizing effects.[2] However, more recent studies isolate the impact of primary challengers from the ideological extreme, but find no (Boatright, 2013), or only modest and conditional (Jewitt and Treul, 2019), effects on polarization.[3]

Nevertheless, while the conventional skepticism among scholars of polarization toward primaries is empirically grounded, there is also reason for skepticism that the standard measures used in these statistical analyses are inadequate for capturing the relationship. Measures of roll call voting may obscure the effect of electoral forces on the legislative behavior of individual members. Party leaders strategically control the legislative agenda to minimize fractionalization within their own party. Consequently, bills that reach the floor for a roll call vote overstate intraparty cohesion (Cox and McCubbins, 1993, 2005), and likely exaggerate polarization among rank-and-file members (Harbridge, 2015). Statistical models test the effects of ideological challenges on roll call voting by looking for variation between those who experienced a challenge and those who did not, but the strategic decisions of party leaders minimize variation across these groups.

Members have considerably more discretion earlier in the legislative process (Harbridge, 2015). In the absence of party influence, and with a broader range of opportunities to support moderate and bipartisan legislation, the effects of ideological challenges (or the mere threat of a challenge) should be more evident than in roll call voting.

In addition to these concerns about the standard dependent variable, existing research on ideological primary challenges and polarization also problematically conceptualizes the independent variable. In their regression models, Boatright (2013) and Jewitt and Treul (2019) implicitly assume that competitive ideological primary challenges *exclusively* influence the legislative behavior of the incumbent that directly faces the challenge.[4] In reality, of course, members pay close attention to political attitudes and activity beyond their district. If a member in one district experiences a competitive primary challenge from the ideological extreme, a strategic co-partisan in a district with demographically and ideologically similar constituents may respond by engaging in more partisan behavior to prevent a future challenge. If this is the case, statistical models that test the one-to-one effects of ideological primary challenges on the particular incumbents who are challenged likely underestimate the overall effects, since pre-emptive movement toward the poles by those who did not directly experience a challenge would narrow the discrepancy in partisanship between challenged and non-challenged incumbents.

I examine the effects of primary challenges on bipartisan bill co-sponsorship. Lawmakers are problem solvers who want to produce legislation (Adler and Wilkerson, 2012). Although contemporary party leaders often bring highly
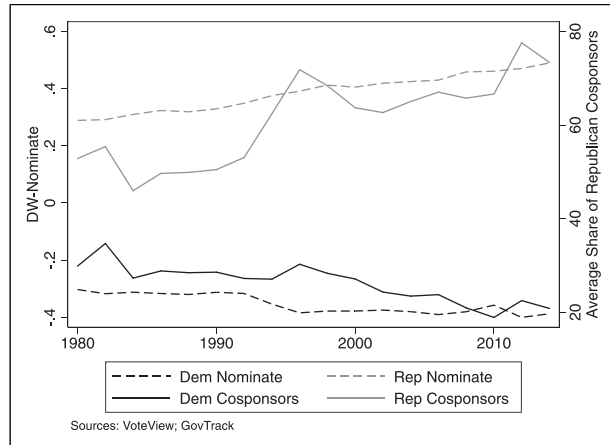
Figure 1. Two measures of polarization in congress.

partisan bills to the floor, it continues to be the case that most bills enacted into law receive bipartisan support in floor votes (Curry and Lee, 2019). Knowing this, bill sponsors intent on turning their legislation into law will make concessions early in the process in an effort to recruit cosponsors from the opposing party.[5]

However, the threat of an ideological primary challenge alters the calculation for otherwise problem-solving legislators, since policy concessions can become fodder for ideological groups and future primary challengers. Consequently, as the threat of a challenge from the ideological extreme increases, legislators become more cautious and limit their electoral vulnerability by avoiding bills that demonstrate their lack of ideological purity. The result is less bargaining and collaboration across the aisle, and fewer moderate, compromise bills capable of being enacted into law (Anderson et al., 2020).

Partisan bill co-sponsorship

To construct a measure of partisan bill co-sponsorship, I pulled co-sponsorship data from GovTrack.us for each Congress from the 96th to the 113th. These GovTrack data include every bill-cosponsor dyad in a given Congress. Each observation is an individual sponsor to a particular bill. Bills with multiple cosponsors have a row for each sponsor. I use these data to calculate the share of Republican and Democratic cosponsors for each bill.[6] Next, I calculate a *partisanship* score for each member in each Congress, which is simply the average share of co-partisan cosponsors on each bill sponsored by that particular member.

Here is a simple hypothetical to illustrate how I created this measure. Let us say, a Republican member only sponsored 2 bills. Bill A had 50 Democratic cosponsors and 50 Republican, so the share of Republican cosponsors is 0.5. Bill B had 5 cosponsors, all of which were Republican, so the share of Republican cosponsors is 1. This hypothetical Republican would have a *partisanship* score of 0.75 in this Congress.

Figure 1 maps the average share of Republican cosponsors by party for each Congress in the dataset, alongside average ideal point estimates using DW-Nominate.[7] Notably, the timing and dynamics of polarization are distinct across these two measures. Although DW-Nominate scores portray polarization as a steady process that accelerated in the 1980s, the co-sponsorship data reveal a choppier pattern. During the early 1990s, as the GOP regained control of the House under the leadership of Newt Gingrich, Republicans became significantly less likely to cosponsor legislation with Democrats. From the early 1990s to the mid-2000s, the level of polarization temporarily stabilized. However, in recent Congresses, members in both parties became considerably less likely to cosponsor with members from the other party.

Raw partisanship scores based on bill co-sponsorship are interesting, but one should be cautious about cross-party comparisons. During the 1980s, as Democrats were in the midst of a long reign of power in the House, Republicans had fewer co-partisans with which to cosponsor, and legislative success was greatly enhanced by cooperating with members of the Democratic majority. Moreover, prior research finds that liberals are more likely to sponsor and cosponsor legislation (Campbell, 1982; Krehbeil, 1995). These factors should lead us to temper an interpretation that Democrats were, in fact, more partisan than Republicans during this period.[8]

Although these data are not necessarily conducive to making strong claims about each party's precise contribution to partisan polarization, we can confidently interpret the growing gap between the parties as evidence that partisan co-sponsorship has significantly increased. This is a deeply concerning phenomenon for Congress as an institution, as well as legislative outcomes. Prior research finds that bill co-sponsorship networks reflect important social dynamics among members (Fowler, 2006a, 2006b), and between members and interest groups (Box-Seffensmeier et al., 2019). The decline in bipartisan co-sponsorship is indicative of the deterioration of bipartisan legislative coalitions. Moreover, members use bill co-sponsorship to signal their support for legislative reform to other members and party leaders (Kessler and Krehbeil, 1996; Koger, 2003), as well as donors (Rocca and Gordon, 2009). Thus, the decline in bipartisan bills exacerbates gridlock and "unorthodox policymaking," as party leaders perceive that fewer and fewer bills on the legislative agenda have broad enough support to succeed through the traditional process (Sinclair, 2012). In sum, as Laurel Harbridge (2015) argues, bill co-sponsorship is an important part of the legislative process because it offers party leaders and members "an opportunity to assess legislative agreement prior to agenda-setting, provide public information about the policy positions of members, and capture positions that are not merely cheap talk (23)."

One-to-one effects of ideological challenges

Before modeling the effects of the *threat* of an ideological primary challenge, I test the one-to-one effects of actual competitive ideological challenges on bill co-sponsorship. Following Jewitt and Treul (2019), I use two data sources to identify primary challengers from the ideological extreme. First, I build on the methodological innovations of Bonica (2014) to more precisely identify primary challengers who are more ideologically extreme than the incumbents they challenge. In his Database on Ideology, Money in Politics, and Elections (DIME), Adam Bonica uses campaign contribution data to construct ideal point estimates (CFscores) of donors and all general and primary election candidates. I use CFscores to identify ideological and centrist primary challenges, by comparing the ideal point estimates of incumbents to those of competitive challengers.

More specifically, for each primary election in which the incumbent receives less the 75% of the vote[9], I average the ideal point estimates of challengers who earn more than 15% of the vote. In most competitive primary elections, only one challenger meets these criteria. Next, I subtract the average challenger CFscore from the incumbent's CFscore. For Republicans, I multiply this difference by -1 to standardize the interpretation of scores—positive values indicate that the incumbent is challenged from the ideological extreme, while negative values indicate a challenge from the center. Lastly, I convert these differenced scores into a dichotomous variable. An election is coded as an ideological challenge if the standardized ideal point difference is positive.

As an alternative measure of ideological challenges, I use Robert Boatright's data on the reason for each primary challenge from 1970 to 2014. Boatright (2013) relies on descriptions of the primary races in each year's edition of *American Votes* and the *Almanac of American Politics*. For each primary election in which the incumbent receives less the 75% of the vote, he codes a challenger as ideological if she criticizes the incumbent for "being too moderate or insufficiently partisan." Boatright includes several other reasons for a challenge (i.e., scandal, competence, age, national issue, and more). These categories are all mutually exclusive. He prioritizes the most frequently mentioned motivation in the *Almanac*.

In this section, I use data from the 96th to 113th Congress to test the one-to-one relationship between competitive primary challenges from the ideological extreme and partisan bill co-sponsorship. I use fixed-effects models to exclusively explain variation in an individual member's legislative behavior over time. By demeaning variables at the level of individual incumbent, these unit fixed-effect models function as a control for each legislator's unique partisan baseline. This unique baseline represents each incumbent legislator's partisan or ideological disposition in the absence of exogenous considerations. Fixed-effects allow us to examine how changes in exogenous factors, such as primary challenges, correspond to an individual member's deviation from that baseline.

I theorize that competitive primaries influence the incumbent's behavior during the concurrent session. Members do not merely wait until the subsequent Congress to adjust their behavior in response to an ideological primary threat. Rather, members constantly survey the political landscape in search for electoral threats (Fenno, 2003). Legislators examine attitudes and organizational activity in their district, and in districts with similar primary voters, to identify potential primary threats. When an intraparty threat looms, members attempt to undercut it by pre-emptively engaging in more partisan legislative behavior. Given incumbent's active monitoring and pre-emptive partisanship, I use contemporaneous models rather than models with lagged independent variables.[10]

The models in Table 1 include a dichotomous measure of an ideological primary challenge using either the Bonica or Boatright data. I also include a dichotomous measure of centrist primary challenges and a continuous measure of the general election margin in each regression—these control variables represent centripetal forces that pull incumbents in the direction of moderation and bipartisanship. I also control for the average *partisanship* of members of the opposing party, since an increase in the average partisanship undoubtedly reduces a member's opportunities to cosponsor across the aisle.

I also include Congress-level variables to control for changes in an incumbent's party that may influence a member's legislative behavior. In every model, I control for both majority status and the number of co-partisans in Congress. Majority status is a dichotomous variable, in which each member of the majority party in a given Congress is a coded as a one, while each member of the minority party is coded as a zero. Similarly, for each member in each Congress, the co-partisan variable is the number of members from the same party. I include the majority status variable because Jewitt and Treul (2019) find that only members in the majority adjust their legislative behavior in response to primary challengers. I include the number of fellow co-partisans given the nature of my dependent variable—since a member's co-sponsorship with the other party is, in part, a function of the number of co-partisan and partisan counterparts in Congress.

Finally, in the even numbered models in Table 1, I include the average DW-Nominate scores of the incumbent's party in a given Congress, as a measure of the party's overall ideological character. On the one hand, including this variable seems appropriate given that the increased conservatism (liberalism) of congressional Republicans (Democrats) correlates with the increase rates of ideological challenges and partisan co-sponsorship. On the other hand, in these models, the validity of the estimated effect of ideological challengers relies on the assumption that the changing ideological character of each party is independent of the rise in ideological primary challenges.

Table 1. Effect of ideological primary challenges on partisan bill co-sponsorship.

	Republicans				Democrats			
	Bonica		Boatright		Bonica		Boatright	
	1	2	3	4	5	6	7	8
Ideological challenge	1.59* (0.62)	0.52 (0.57)	3.2** (1.03)	2.5* (0.97)	1.8** (0.55)	1.7** (0.51)	3.1** (0.97)	2.8** (0.99)
Centrist challenge	−0.84 (0.74)	−0.88 (0.66)	−2.4 (1.8)	−2.1 (1.5)	0.015 (0.49)	0.17 (0.44)	−0.10 (1.2)	0.57 (1.0)
General margin	−0.19 (0.62)	−0.57 (0.53)	−0.12 (0.74)	−0.49 (0.53)	1.1** (0.40)	1.2** (0.35)	0.95* (0.40)	1.01** (0.35)
Opposition partisanship	−0.24*** (0.053)	−1.2*** (0.069)	−0.24*** (0.054)	−1.2*** (0.07)	0.11*** (0.026)	−0.23*** (0.026)	0.11*** (0.027)	−0.23*** (0.026)
Co-partisans	0.18*** (0.62)	0.033*** (0.013)	0.18*** (0.01)	0.033* (0.013)	0.09*** (0.007)	0.14*** (0.007)	0.09*** (0.007)	0.14*** (0.007)
Majority	−1.5** (0.53)	1.6** (0.56)	−1.5** (0.53)	1.6** (0.56)	−0.48 (0.36)	2.8*** (0.32)	−0.46 (0.36)	2.9*** (0.32)
Party ideology	1.2*** (0.007)	1.2*** (0.007)	1.2*** (0.007)	1.2*** (0.007)		−2.1*** (0.10)		−2.1*** (0.10)
R^2	0.38	0.47	0.38	0.47	0.15	0.28	0.15	0.28
N	2624	2624	2624	2624	3312	3312	3312	3312
N	651	651	651	651	709	709	709	709
T	18	18	18	18	18	18	18	18

*$p < 0.05$, **$p < 0.01$ and ***$p < 0.001$.

The dependent variable in each model is *partisanship*—the average share of co-partisan cosponsors out of all bills cosponsored by the member in a given Congress. The models in Table 1 are organized by party and data used to measure of primary challenges. Positive coefficients indicate a predicted increase in the average share of co-partisan cosponsors.[11]

The results are strikingly similar across the two parties, and somewhat similar across the two measures of ideological primary challenges. Based on the models using Bonica's data to measure challenges, a competitive ideological challenge predicts that the average share of co-partisan cosponsors increases by somewhere in the range of 0.5–1.6 percentage points for Republicans and about 1.8 percentage points for Democrats. That is, for both parties, an ideological primary challenge indicates that members cosponsor fewer bills with members of the opposing party. This amounts to about one-eight of a standard deviation change in partisan co-sponsorship for Republicans, and nearly one-fourth of a standard deviation increase for Democrats. The effects of ideological primary challenges are larger using the Boatright measure, which corresponds to about a 2.5 to 3.2 percentage point increase in *partisanship* for members in both parties.

Modeling the threat of ideological primary challenges

However, given the rarity of competitive ideological primary challenges (Boatright, 2013), if ideological primary challenges explain a significant share of the rise in polarization, it is because the recent surge in challenges prompts "scared" incumbents to act more partisan. Measuring the indirect effect ideological challenges have on the legislative behavior of members is difficult (Boatright, 2013). However, the importance of this task is greater than the difficulty.

I conceptualize the threat of an ideological primary challenge as a quasi-latent variable. On the one hand, ideological threat is a force that can act upon legislators independent of any observable materialization of this threat. On the other hand, ideological threat manifests in measurable phenomena, such as the aggregate primary vote share or campaign receipts of challengers more ideologically extreme than the incumbent. In this section, I rely on the former as an observable manifestation of ideological threat. I test the effects of this quasi-latent variable with a two-stage model, in which partisanship in bill co-sponsorship, *partisanship*, is regressed on the predicted vote share of ideological primary challengers.

Using Adam Bonica's DIME data, I construct two sets of measures for two distinct conceptions of ideological primary challengers. First, I follow the same procedure from the previous analysis to identify all of the challengers who are more ideologically extreme than the incumbent they challenge. I refer to these candidates as *relative* ideologues. I calculate the absolute value of the difference in ideal point

estimates (i.e., CFscores) between each challenger and the respective incumbent from 1979 to 2013. Positive differences indicate that the challenger was more conservative than the incumbent, and negative differences indicate that the challenger was more liberal. Next, I pool together the vote share of ideological primary challengers by incumbent candidate and election cycle. In most cases, there are fewer than two ideological challengers, but when multiple extreme candidates challenge an incumbent, I aggregate their vote shares. This measure gives us the total share of votes received by challengers who were more ideologically extreme than then incumbent in a given primary election.

I also construct a measure of the total vote share of *absolute* ideologues. Rather than including all challengers who are more extreme relative to their respective incumbent, I use the CFscore of 1.25 as a cut point to identify ideological challengers.[12] For each Congressional primary featuring an incumbent, I aggregate the vote share of all challengers for whom the absolute value of their ideal point estimate is at least 1.25.[13]

Figure 2 maps the rise in the average vote share of ideological challengers against the rise in partisan bill co-sponsorship. In each graph, the *y*-axis on the left-hand side measures the average vote share received by relative and absolute ideologues. The *y*-axis on the right-hand side is the average share of co-partisan cosponsors. In general, both measures of ideological challenger vote share are correlated with partisan co-sponsorship. Most notably, the vote share of both relative and absolute ideological challengers surged from 2006 to the 2014, as did the rate at which members cosponsor legislation with co-partisans.

I construct two-stage models for both relative and absolute ideological challengers. In the first stage, I model the effects of numerous district-level variables on total vote share received by all candidates more ideologically extreme than the incumbent. That is, I use a host of variables that may be associated with the threat of an ideological primary challenge to predict an observable manifestation of that threat. In the second stage, I test the effects of this threat on partisan bill co-sponsorship. Since the factors that predict the vote share received by ideological primary challengers are distinct for Democrats and Republicans, I employ a distinct two-stage model for each party.

More specifically, the second stage model is as follows

$$\begin{aligned}
Partisanship_{ic} = {} & \tau_i + \gamma \widehat{IdeoShare}_{ic} + \beta_0 \\
& + \beta_1 CentristChallenger_{ic} + \beta_2 GenMargin_{ic} \\
& + \beta_3 OppositionPartisan_c + \beta_4 Copartisans_c \\
& + \beta_5 Majority_c + \beta_6 PartyIdeology + v_{ic} {}_c
\end{aligned}$$

where τ_i are the fixed-effects for each individual legislator, v_{ic} is the overall errors component, and β_0 is the constant, β_1 is the coefficient of the vote share of centrist primary challengers, β_2 through β_6 are the coefficients for other control variables, and γ
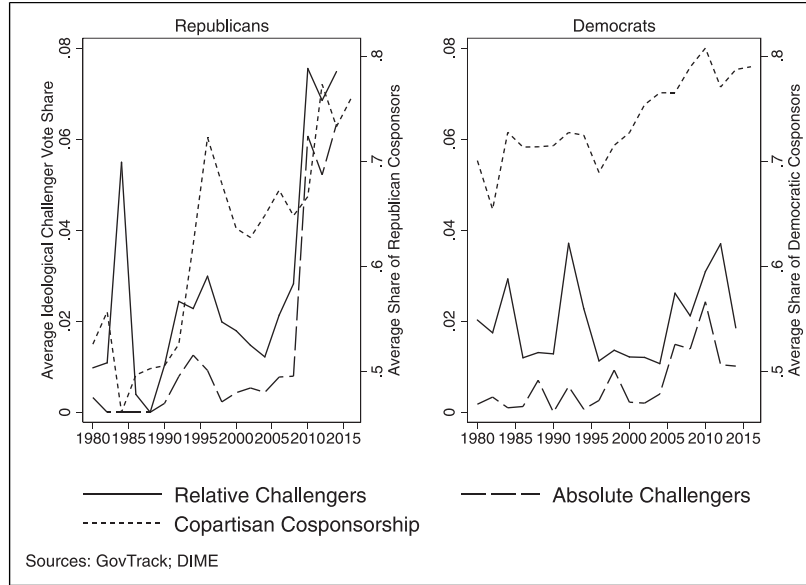
Figure 2. Vote share of ideological challengers and partisan co-sponsorship.

estimates the predicted values of the quasi-latent variable $\widehat{IdeoShare}_{ic}$, which is estimated in the first stage

$$IdeoShare_{ic} = \delta_0 + \delta_1 NegativePartisanship_c$$
$$+ \delta_2 PresVoteShare_{ic}$$
$$+ \delta_3 NegativePartisanship*PresVoteShare_{ic}$$
$$+ \delta_4 \%Black_{ic} + \delta_5 \%ForeignBorn_{ic}$$
$$+ \delta_6 \%BlueCollar_{ic} + \delta_7 \%Unemployed_{ic}$$
$$+ \delta_8 PopDensity_{ic} + \delta_9 EastNorthCent_i$$
$$+ \delta_{10} MidAtlantic_i + \delta_{11} DeepSouth_i + \delta_{12} Mountain_i$$
$$+ \delta_{13} Pacific_i + \delta_{14} WestNorthCent_i$$

where δ_1 is a regression coefficient of a variable that varies over time but not across members in a given Congress, δ_2 and $\delta_4 - \delta_8$ are coefficients of district-level variables that vary over time and members, δ_3 is the coefficient of the interaction of negative partisanship and party presidential vote share, and $\delta_9 - \delta_{14}$ are coefficients for dummy variables on the geographical region in which the member's district is located. For each variable, I use the most contemporaneous data available. This "garbage can" model incorporates district-level demographic data that may correspond to the threat of a primary challenger.[14]

I use the vote share of a member's co-partisan presidential candidate in the previous president election cycle as a measure of district partisanship and ideology. *Negative partisanship* measures affect among co-partisans in the electorate toward identifiers from the opposite side of the ideological spectrum. That is, this variable captures the average feeling Republicans' (Democrats') have toward liberals (conservatives). These measures come from ANES

feeling thermometers. For self-identified partisans, I took the average thermometers rating of the opposite ideological group in each election cycle. I used rolling averages to estimate these scores for mid-term cycles for which ANES surveys were not conducted. I exclude partisan leaners to better approximate primary voters.

Unlike the other variables in the first stage models, *negative partisanship* only varies by Congress, and not across districts. In this sense, *negative partisanship* functions as a more theoretically informed alternative to time fixed-effects. The primary election culture is certainly distinct across election cycles in ways that are related to the popularity of ideological challengers, and as recent studies demonstrate much of what animates change in the party base across time is affect toward members of the other party (Abramowitz and Webster, 2016; Mason, 2015, 2018). I also interact *negative partisanship* with *district ideology* to allow the effects of overall negative partisanship to vary across districts.

Before examining the results of these models, it important to note how the models analyzed in the next section are distinct from conventional two-stage least-squares regression models. Two-stage regression models are typically used to conduct instrumental variable (IV) analysis, which is a method used to mitigate endogeneity. In IV analysis, the purpose of the first stage is to generate predicted values of the main explanatory variable of interest that are unrelated to the dependent variable in the second stage. Consequently, the validity of such models relies on the assumption that the explanatory variables in stage one only indirectly affect the dependent variable in stage two through the explanatory variable in stage two (i.e., exclusion restriction). In this

Table 2. Effects of ideological primary threat on partisan bill co-sponsorship.

	Republicans				Democrats			
	Relative		Absolute		Relative		Absolute	
	9	10	11	12	13	14	15	16
VoteShare	1.1*** (0.07)	0.64*** (0.08)	1.5*** (0.07)	1.0*** (0.08)	3.2*** (0.29)	3.2*** (0.27)	6.4*** (0.53)	6.2*** (0.48)
Centrist challenge	−1.4 (1.6)	−1.5 (1.5)	−5.3 (3.3)	−4.7 (3.9)	−0.42 (1.1)	0.25 (0.95)	−0.25 (3.6)	0.92 (3.2)
General margin	0.77 (0.54)	0.73 (0.54)	−0.23 (0.56)	−0.46 (0.53)	11.4*** (1.1)	11.6*** (1.0)	1.5*** (0.39)	1.5*** (0.34)
Opposition partisanship	−0.5*** (0.04)	−1.1*** (0.07)	−0.56*** (0.05)	−1.1*** (0.07)	0.02 (0.03)	−0.37*** (0.03)	−0.28*** (0.04)	−0.60*** (0.04)
Co-partisans	0.14*** (0.04)	0.055*** (0.014)	0.13*** (0.01)	0.053*** (0.013)	0.08*** (0.008)	0.13*** (0.007)	−0.04*** (0.009)	−0.09*** (0.009)
Majority	0.02 (0.56)	1.6** (0.58)	0.43 (0.55)	1.9* (0.57)	−3.0*** (0.39)	0.30 (0.33)	−2.5*** (0.38)	0.82** (0.31)
Party ideology		0.84*** (0.08)		0.77*** (0.08)		−2.1*** (0.09)		−2.0*** (0.10)
R^2	0.45	0.49	0.47	0.51	0.24	0.38	0.21	0.34
N	2624	2624	2624	2624	3312	3312	3312	3312
n	651	651	651	651	709	709	709	709
T	18	18	18	18	18	18	18	18

*$p < 0.05$, **$p < 0.01$ and ***$p < 0.001$.

paper, I am merely using two-stage least squares to generate a reasonable quantitative representation of the threat of an ideological challenge, rather than to mitigate endogeneity concerns, and thus the strict exclusionary restriction does not apply here.

Primary threats and pre-emptive partisanship

Table 2 displays the results from the second stage of the two-stage models.[15] For both parties, the effects of the threat of a potential ideological challenge (both relative and absolute) are highly statistically and substantively significant. For Republicans, a one-percentage point increase in the predicted vote share of primary challengers who are more ideologically extreme than the incumbent corresponds to 1.1 increase in the average share of Republican cosponsors, while a one-percentage point increase in the predicted vote share of primary challengers with a CFscore of at least 1.25 corresponds to about a 1.5 increase in the average share of co-partisan cosponsors. When the average DW-Nominate score of Republicans in a given Congress is included, the predicted increase drops to 0.64 and 1.0, respectively.

The results are more striking for Democrats. A one-percentage point increase in the predicted vote share of primary challengers who are more ideologically extreme than the incumbent corresponds to a 3.2 increase in the average share of Democratic cosponsors, while a one-percentage point increase in the predicted vote share of primary challengers with a CFscore of at least 1.25 corresponds to about a 6.4-point increase in the average share of co-partisan cosponsors. In standardized terms, depending on the measure of ideological challenger, a one standard deviation increase in vote share predicts about a one-twelfth to one-tenth standard deviation increase in *partisanship* for Republicans, and about a one third to over two-thirds standard deviation increase in partisans' co-sponsorship for Democrats.

These findings indicate that the recent surge in ideological primary challenges in both parties is having a meaningful effect on partisanship. Among Republicans, the predicted vote share of *relative* ideological challengers increased from less than 1.5% in the 1980s, to about 6.5% in the early 2010s. For Democrats, the predicted vote share of *relative* ideologues increased from about 1.9% in the 1980s to 2.9% during the Obama years. According to the results displayed in Table 2, this five-percentage point increase in GOP primary challenges corresponds to a 3.2 to 5.5 percentage point increase in *partisanship*, while the one-percentage point increase in the predicted vote share of a Democratic challengers from the left accounts for about a 3.2 percentage point increase in *partisanship*.[16]

To put these results in perspective, consider them in relation to the overall rise in partisan bill co-sponsorship that occurred during this period. From the 1980s to the 2010s, the average share of co-partisan cosponsors among Republicans increased from about 51% to 75.5%.

For Democrats, the average *partisanship* increased from an average of about 70%–78% during this same period. However, these raw rates likely overstate the increase in partisanship among Republicans, while understating the degree of change among Democrats. Since Republicans held far more seats in the 2010s than the 1980s, we would expect the rate in which they cosponsor bills with fellow Republicans to increase over that period. Likewise, the increased rate of co-partisan cosponsors among Democrats is especially noteworthy given that the party held an average of 63 fewer seats in the 2010s than the 1980s.

To more accurately approximate the extent to which each party' rise in partisan co-sponsorship is truly attributable to partisanship, I use the coefficients from Table 2 to estimate a contemporary Congress in which the balance of power between the parties remained constant from 1980 to the 2010s. Controlling for the number of co-partisans serving in the chamber, Republicans increased their partisanship rate by about 17 percentage points, while Democrats increased by about 14.5 percentage points. These figures indicate that the increased threat of ideological primary challengers explains about 20–25% of the rise in partisanship in both parties during this period.[17]

Conclusion

Existing research finds minimal effects of primaries on the legislative behavior of legislators, as measured by patterns in roll call voting. However, since bills that reach the floor reflect the strategic calculations of party leaders, and are thus more ideological than the universe of bills introduced in a given Congress (Harbridge, 2015), the effects of ideological primary challengers are less evident in roll call voting than they are in earlier stages of the legislative process in which members have more discretion. Using a novel dataset on partisanship in bill co-sponsorship, this manuscript analyzes that effect of ideological challenges on members' behavior earlier in the legislative process. I find that a competitive primary challenge from the ideological extreme decreases the rate at which Republicans and Democrats cosponsor bills with members of the other party.

This manuscript also advances the study of polarization by examining the effects of the mere threat of experiencing an ideological primary challenge. I use an innovative two-stage model to estimate the predicted vote share of challengers from the ideological extreme, and regress partisan bill co-sponsorship on the predicted vote share. I find that the increased threat of an ideological primary challenge accounts for about a quarter of the rise in partisanship that occurred from the 1980s to the 2010s.

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ORCID iD

Richard Barton ⓘ https://orcid.org/0000-0003-1952-793X

Supplemental material

Supplemental material for this article is available online.

Notes

1. Kamarck and James (2018). "Anticipating Trouble: Congressional Primaries and Incumbent Behavior." Brookings Institute. https://www.brookings.edu/research/anticipating-trouble-congressional-primaries-and-incumbent-behavior/; Rauch, Jonathan. 2016. "How American Politics Went Insane: It happened gradually—and until the U.S. figures out how to treat the problem, it will only get worse." *The Atlantic*. https://www.theatlantic.com/magazine/archive/2016/07/how-american-politics-went-insane/485570/; Lieberman, Joseph. 2018. "A New Way To Keep Ideologues Out of Congress." *Time*. https://time.com/5238129/2018-primaries-elections-congress-partisanship/

2. Boatright (2013) systematically coded the reason of all congressional primary challenges from 1970 to 2016. Challengers most commonly criticize the incumbent for being too old or incompetent. Ideological challenges are the second most common.

3. Jewitt and Treul (2019) find that members in the majority (but not the minority) who experience a challenge from the radical flank demonstrate more ideological behavior in roll call voting. Nevertheless, the effect size is rather modest. Moreover, while primary challenges from the radical flank are more common, competitive primary challenges are still rare, thus Jewitt and Treul's findings only apply to a small minority of members.

4. I am referring to the standard assumption that observations are independent and identically distributed.

5. For some firsthand examples, see David Price's discussion of a banking bill on the regulation of adjustable-rate mortgages during the late 1980s (2000: 89–91), or Sherrod Brown's description of the legislator process behind the Safe Drinking Water bill (2004: 197–199).

6. I follow Harbridge's (2015) practice of dropping bills that are sponsored by a single legislator. If I included solo bills, they would be coded as purely partisan, which is problematic because most individually sponsored bills are more particularistic than partisan.

7. For Democrats, *partisanship*, the main dependent variable in this paper, measures the average share of Democratic cosponsors. However, for the purpose of comparing partisan bill co-sponsorship to DW-Nominate scores, I trace that the average share of Republican cosponsors for both parties in Figure 1.

8. In the analysis sections that follow, I deal with these concerns by controlling for majority status, the number of co-partisans, and the average *partisanship* rate of the other party in a given Congress.

9. Seventy-five percent is the standard threshold in the literature to measure a competitive *primary* election.

10. For example, I match the 2006 primary election results to the 109th Congress.

11. To account for serial correlation and spatial autocorrelation, I clustered standard errors at the level of incumbent in every model in this paper.

12. The idea was to use a cut point that would identify challengers who are considerably more ideologically extreme than the average congressperson. For Republicans, 1.25 is about 1.56 standard deviations above the mean of all Republicans who served during this period, and for Democrats -1.25 is about 1.84 standard deviations below the mean. Only 27 Democratic members and 13 Republican members have CFscores that are this extreme. Regarding Democratic members, this ranged from Jared Huffman to Bernie Sanders, and for Republicans this ranges from Mike Pompeo to Ron Paul. See Supplemental Appendix 1 for more details. Of course, the exact threshold of 1.25 is arbitrary. Lowering (1.0) and increasing (1.5 and 2.0) this threshold does not significantly alter the results.

13. As a robustness check on the results found with the Bonica scores, I replicate the process described in this section using ideal points constructed by Andrew Hall and James Snyder. The Hall-Snyder ideal points are similarly estimated using campaign contribution data, only these scores only include donations given during the primary. These may be superior estimates of candidate ideology, since donations made during the primary are more likely to reflect the true preferences of donors. See Hall and Thompsen (2018) for discussion of these data. My process for identifying *relative* extremists using the Hall-Snyder data is identical to that using the Bonica data. For *absolute* extremists, I use 0.3 as the threshold, because the Hall-Snyder ideal points are clustered more tightly around zero. See Supplemental Appendix 3 for results with these data.

14. Just to be clear, primary elections featuring an incumbent are included in both the first and second stage models, including those in which the vote share of ideological challengers is zero.

15. See Supplemental Appendix 2 for the results from the first stage.

16. I also ran the same two-stage models with measures of vote share, for both relative and absolute extremists, using the

Hall-Snyder ideal point estimates in lieu of the Bonica scores (see footnote 19). The statistical and substantive significance of the effects of predicted *ideoshare* on *partisanship* are very similar using the Hall-Snyder data. See Supplemental Appendix 3 for the results of the second stage of these models.

17. The magnitude of the effects of absolute primary challengers is even greater.

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Author biography

Richard Barton is a PhD Candidate in Government at Cornell University.