The Quality of District Representation in U.S. House Committees

Josh M. Ryan*
Department of Political Science
Utah State University

Abstract

Do members of Congress adhere to the preferences of their districts within standing committees? Legislator roll call behavior on the floor is consistent with district preferences, but member behavior in committees is not easily monitored by constituents. This may give legislators substantial freedom to disregard constituent preferences in their committee roll call voting without suffering electoral consequences. I use a dataset of individual committee votes to create Optimal Classification ideology scores for legislators within committees. Two-way fixed effects estimates and a redistricting natural experiment show that members of the House largely represent district preferences, but the quality of representation declines over time, and is conditioned by committee heterogeneity and electoral security. In committees where jurisdictional complexity is high and party preferences are outlying, legislators' voting records diverge from the preferences of their district, though low incumbent vote share strengthens the relationship between district preferences and committee voting.
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*Working Paper, comments welcome. 0725 Old Main Hill, Logan, UT 84322. josh.ryan@usu.edu. I thank Ryan Bell for helping collect and format the committee votes data, and Gary Jacobson for sharing his House elections data. I also thank Carlos Algara, James Lo, Greg Goelzhauser, Michael Touchton, Jim Curry, and Jon Rogowski for their feedback and suggestions.

That legislators represent their constituents is the most fundamental requirement of republican government, as the incentives generated by elections should ensure a strong connection between constituent preferences and policy outcomes (Downs 1957; Mayhew 1974). In the United States, members of Congress have responsibility for ensuring the collective preferences of the public are translated into national policy, and there is substantial evidence that House members and Senators serve as faithful representatives when it comes to visible legislative activities like roll call voting on the floor.

Much of the recent representation literature explores the limits of this connection as members of Congress may be less responsive when voters are unable to monitor their behavior (Kalt and Zupan 1990). The consequences of greater representational slack may be to encourage representatives to behave as Burkean trustees, especially for issues on which their party has strong, outlying preferences, or for issues on which legislators have policy-based expertise. The result may be more partisan or competent, though potentially less representative, legislative outcomes. Similarly, during periods of congressional polarization in which legislators are electorally punished for insufficient extremity, reduced voter oversight from may encourage compromise. Alternatively, and less normatively appealing, slack may empower individual legislators, interest groups, parties, or other actors to shape policy to their advantage without the knowledge of voters.

I examine the quality of representation provided by House members through their work in standing committees, an ideal institutional setting in which to test low visibility congressional representation. Committees are at the center of legislative creation and bureaucratic oversight, but do not attract the same level of public attention as floor activity. Most member behavior within committees is not easily observed, and quantifiable measures of representation, such as recorded votes, are not readily obtainable. This lack of scrutiny would seem to give members increased autonomy when engaging in the nuts and bolts of crafting legislation. Importantly, if legislative behavior at the committee stage is unrepresentative, subsequent floor action which reflects constituent preferences may have little more than symbolic value.

Specifically, is roll call voting behavior within committees consistent with the ideological preferences of a legislator's district? I also determine whether the quality of representation degrades over time; evidence from floor voting indicates that legislator-district congruence is due to initial preference alignment between legislators and their districts, rather than preference adaptation as a result of changes in district characteristics. If it is the former, then representation quality depends on the extent to which district preferences are static. Finally, I examine whether there are heterogeneous effects

across committees because of information- and party-induced outlying preferences, and whether legislators become more sensitive to district preferences as their electoral prospects become more tenuous.

To determine whether committee behavior reflects constituent preferences, I use an original dataset of all member-level recorded votes within committees to create Optimal Classification scores, which are similar to W-NOMINATE scores, as a measure of legislator ideology. Using two-way fixed effects estimates, I find that legislators in more Democratic districts produce more liberal voting records, and moderate districts produce more moderate representation. However, the data also show that legislators do not change their ideological orientation as their districts change. Further, legislators who represent moderate districts but serve on committees with extreme partisan and information-based preferences have roll call voting records that diverge from their districts' preferences, though this effect is mitigated by electoral pressure.

These findings have important implications for the quality of representation within House standing committees and inform debates about making the legislative process more visible to constituents. For example, the House Modernization Committee, reauthorized through the 117th Congress (2021-2022) has proposed creating an easily accessible online database of all committee roll call votes.[1] Critics suggest that this will only further polarization within the institution because legislators will change their behavior if they know their voting behavior can be monitored (see Harden and Kirkland 2021 for a summary of this debate). The research here suggests that House members, for the most part, already behave as if their votes were being closely monitored. And, in those situations in which they do not, they are influenced by parties and policy complexity. Increased oversight might reduce the effects of these factors as the results here also show that when members are more wary of their voters they adhere closer to their preferences.

Roll Call Voting and District Representation

There is strong evidence for two mechanisms that ensure electoral-based constraints on legislator roll call behavior. First, members of Congress *believe* their actions are closely monitored by their constituents. Fenno (1978) writes that legislators are careful about their voting record because they do not know *ex ante* which votes will be important to constituents, leading them to exercise caution on potentially controversial issues. Similarly, Matthews and Stimson (1975) find that legislators are cognizant

[1] Select Committee on the Modernization of Congress, "Recommendations," at https://modernizecongress.house.gov/recommendations.

of their voting record and the risk that it might be used against them, while surveys of Representatives have shown that on controversial issues they carefully weigh information from a variety of sources to help make a roll call voting decision (Kingdon 1973; Sullivan et al. 1993).

Second, members are electorally punished for behaving in a way that is inconsistent with the preferences of their constituents. Public opinion data show that legislators' district reputations decline as their roll call voting behavior diverges from the preferences of their constituents (Ansolabehere, Snyder and Stewart 2001; Binder, Maltzman and Sigelman 1998; Erikson 1990; Peskowitz 2017; Shor and Rogowski 2018), resulting in a decline in vote share (Canes-Wrone, Brady and Cogan 2002; Carson et al. 2010). Even taking a single "incorrect" vote can result in electoral sanction (Nyhan et al. 2012). Taken together, this evidence suggests that representation conferred by members of Congress, as measured by roll call voting within the chambers, is consistent with the preferences of their district.

Influences on Legislator Roll Call Voting

The extent to which members represent constituents within committees, however, is largely unknown[2] and committees offer a unique opportunity for members to drift from voter preferences while (potentially) avoiding electoral sanction (Hall and Wayman 1990). There are a variety of factors external to the legislator-voter relationship that affect member voting (Kingdon 1989), and because committee activity and roll call votes are not easily accessible to the public, the relative influence legislators give to these other factors may increase.

Aside from voters, parties are perhaps the most important influence on legislator voting decisions as they use inducements and the threat of punishment to encourage members to vote the party's position in an effort to enforce collective action (Cox and McCubbins 1993). Members who are insufficiently loyal or hurt the party's brand may be assigned to low quality committees or removed altogether, producing negative consequences for the member (Grimmer and Powell 2013). Parties exert increased pressure on wavering members are most needed, though these are also the votes for which moderate legislators are most likely to be punished (Snyder and Groseclose 2000). I expect these dynamics to occur at the committee level as well, as parties use the committee system to exert agenda control over the chamber's business and protect members from internally divisive votes on the floor (Cox and McCubbins 2005). Jones (1961), in his study of the Agriculture Committee during the "textbook" post-war congressional

[2]Members use committees as a mechanism to distribute goods to voters (Shepsle 1978; Shepsle and Weingast 1994), but this does not imply that members' voting behavior is ideologically consistent with their voters' preferences.

period, finds that party preferences play an important conditioning role on member roll call voting behavior.

Rather than exclusively voting the interests of parties, committees may serve the chamber median to minimize uncertainty and produce "good" policy (Fenno 1973; Kingdon 1973; Krehbiel 1991). The committee system is designed to allow legislators to acquire expertise and become issue-area specialists Cooper (1970); Curry (2019); Gilligan and Krehbiel (1990). This may lead them to substitute information-based preferences about the creation of good public policy in place of constituent preferences (Howell, Jackman and Rogowski 2013; Olson and Rogowski 2020) as increased information about legislation changes legislators' voting and position-taking behavior (Fong 2020; Zelizer 2018). This is consistent with the Burkean perspective of trustee representation, in which representatives ought to use their own judgment, "and he betrays, instead of serving you, if he sacrifices it to your opinion" (Burke 1986, 391).

There is substantial evidence that while legislators represent districts well when first elected, they are unwilling or unable to change their behavior over time, and the quality of representation degrades as the district changes (Lo 2013; Poole and Rosenthal 2007). This may be due, in part, to members acquiring expertise and substituting their own beliefs or preferences about good policy to guide roll call voting decision-making (Bianco, Spence and Wilkerson 1996; Kau and Rubin 1993; Lindstadt and Vander Wielen 2011).

These three competing pressures—voters, parties, and personal preferences from committee-based policy information—drive legislator roll call voting to differing extents. Because constituents are less able to monitor their voting, members may feel free to cast votes in line with their party's preferences in order to secure benefits from the party. Similarly, they may cast votes that minimize uncertainty and produce optimal policy without worrying about the preferences of their district voters. Voting behavior based on party and legislator preferences is often seen as normatively bad, though the use of private information by legislators to make decisions is also sometimes viewed as normatively good if it produces better policy outcomes, regardless what constituents might want. I do not adjudicate between these perspectives, but instead seek to inform this normative debate by characterizing the conditions required for legislators to stray from their district preferences when voting in committees.

Committee Roll Call Voting Influences and Behavior

To determine whether legislators' voting behavior in committees reflects district preferences, I develop a model in which a legislator seeks to maximize their utility from their roll call record, accounting for the preferences of voters and partisan and informational factors.[3] Similar to Lindstadt and Vander Wielen's (2011) "calculus of position taking" and Levitt's (1996) model of senator voting behavior, I assume votes are cast in a one dimensional policy space where legislator $i's$ overall utility is a linear loss function that depends on their roll call voting record, ω, and its proximity to other relevant actors and influences: their district median voter, their party, and information induced preferences from committee service.[4] Party preferences represent the ideological location that the party median would like their co-partisans' committee roll call voting record to reflect (Cox and McCubbins 2005).[5] This ideal point varies across committees as the legislator's party may have extreme ideological preferences on one committee (e.g., Rules), and weak or moderate ideological preferences on another committee (e.g., Small Business).

Information-induced preferences represent the ideal point a legislator would set their voting record at given the revelation of policy information or expertise they acquire from serving on the committee. Levitt (1996) assumes a legislator's inherent ideological preference is exogenously determined, and this preference should be partially a function of information acquired as a result of committee service. The effect of information varies across committees which have different levels of jurisdictional complexity and reveal different amounts of information to legislators. For example, legislation dealt with by Veterans' Affairs may be less complex for a legislator than those dealt with on Ways and Means.

Given these influences on a legislator's roll call voting record, legislator i's utility is:

$$U_i = -[\alpha|\omega_i - v_i| + \beta|\omega_i - l_j| + (1-\alpha-\beta)|\omega_i - d_j|] \tag{1}$$

where v_i is the ideal point of legislator i's district median voter, l_j is the legislator's preference as a result of information acquisition on committee j, and d_j is the party's ideal point on committee

[3]While there are undoubtedly other exogenously determined factors that influence a legislator's ideology (e.g., previous employment), these vary across legislators not committees, and I am concerned with heterogeneous committee-based effects. The empirical models also control for factors constant at the legislator-level.

[4]While the one dimensional policy space assumption has been shown to hold reasonably well on floor voting (Poole and Rosenthal 1997), it should be especially true for committee voting as committees deal with very specific issue-spaces.

[5]I use the party median as the location of the party's ideal point, but the ideal point of the party as a unitary actor could be the party leader or some other party actor. The claim is only that the legislator's party is a unitary actor which has an ideal point distinct from that of the legislator's district median voter.

j. α and β represent the relative weights of each factor on the legislator's utility. Both party and information-induced preferences are at the committee-level, meaning that they vary by committee, but their influence on ω are constant across legislators on committee j.

A legislator's voting record is the weighted average of all three ideal points:

$$\omega_i = \alpha v_i + \beta l_j + (1 - \alpha - \beta) d_j \tag{2}$$

The baseline expectation is that legislator voting records in committees are consistent with the preferences of their district, as is the case for floor voting. If this is true, each ideal point must be approximately the same and the legislator maximizes their utility by developing a roll call voting record where $\omega \approx v_i \approx l_j \approx d_j$, regardless of the relative weights of each. Alternatively, $\omega = v_i$ if the weights assigned to l_j and d_j equal zero. If either of these conditions are met, legislators in more liberal (conservative) districts will produce more liberal (conservative) roll call voting records.

Hypothesis 1A: As district liberalism (conservatism) increases, a legislator's roll call voting record will be increasingly liberal (conservative).

Not only should the ideological orientation of a district affect a legislator's voting record, but more extreme districts should produce more extreme legislator roll call voting records. Spatial theories of representation suggest electoral competition incentivize legislators' to set their roll call voting ideal point at the ideal point of the voter (Downs 1957). As a result, when the district median shifts left or right relative to the national median, so too should the legislator shift left or right (more extreme) relative to their colleagues.

Hypothesis 1B: As district extremity increases, a legislator's roll call voting record will be increasingly extreme.

Poole (2007) claims that members "die in their ideological boots," being unwilling or unable to adapt to changes in their district's ideological orientation. Thus, ideological and extremity congruence is predicted to be the result of member replacement rather than adaptation. Over time, as districts change, the quality of representation will degrade as ω and v_i diverge.

Hypothesis 1C: As district partisanship changes, a legislator's roll call voting record will diverge from the district's preferences.

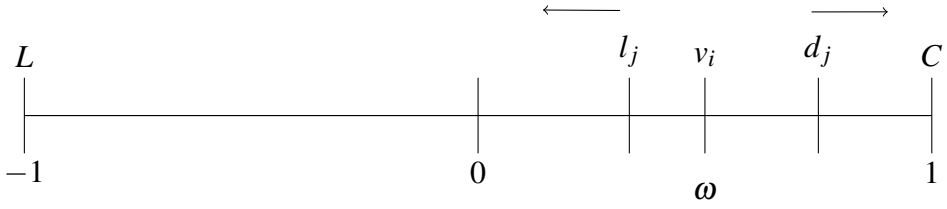
Committee-Based Heterogeneity and Roll Call Voting

I relax the assumption that all ideal points are approximately equal to each other by allowing d_j and l_j to diverge from v_i (in the next section I allow the weights assigned to each to vary). If the ideal points of all these actors are not identical but each ideal point is weighted equally, the legislator maximizes their utility by minimizing the cumulative distance between all these points and ω, which is done by setting ω to the median ideal point.[6]

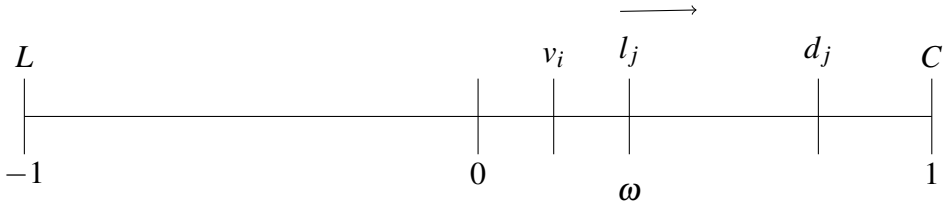
Figure 1 shows a one dimensional policy space scaled from liberal L (equal to -1) to conservative C (equal to 1) with 0 lying at the ideological center, the different ideal points for each of the three factors, and the ideal point at which the legislator sets their roll call voting record ω. In this case, the district has an ideological conservative median voter, though the inferences generalize to a liberal district.

Figure 1: Committee Roll Call Voting Based on Preference Distributions

District Voter Ideal Point is Interior to Other Preferences



District Voter Ideal Point is Exterior to Other Preferences



For either committee-level factor to affect legislator voting behavior, the voter's ideal point must be exterior to both, or $v_i < l_j$ and $v_i < d_j$. As the top panel of Figure 1 shows, if this is not true, even significant divergence of both information-induced preferences and party preferences are irrelevant because the legislator's roll call voting record will reflect the preferences of voters.

In the bottom panel of Figure 1, the ideal point of the party and of the legislator's information-based preference lie to the right of the district median voter. The distance from v_i to l_j is $l_j - v_i$, and

[6]Minimizing the space between these points is the geometric median which equals the median in a one-dimensional space.

the distance from v_i to d_j is $l_d - v_i$. Assuming $l_j > v_i$ and $d_j > v_i$, if $l_j - v_i < l_d - v_i$ then $\omega = l_j$, and as $l_j - v_i$ increases, the distance from the legislator's roll call voting record and the voter's preference, $\omega - v_i$, also increases. If $l_j - v_i > l_d - v_i$ then $\omega = d_j$ and as $l_d - v_i$ increases, so does $\omega - v_i$. That is, the divergence of one ideal point only matters insomuch as the *other* ideal point is closer to the edge of the policy space than the other two ideal points. As one ideal point diverges, it pulls the legislator's voting record away from the ideal point of the voter (until it moves past the other committee-induced ideal point).

For example, in the bottom panel of Figure 1, as l_j moves to the right, ω does so as well, *until* $l_j > d_j$. When that occurs, d_j then becomes the median and where ω will be located; increasing extremity in l_j will have no effect on the legislator's voting record. Roll call voting record divergence from the median voter will occur when both the party- and the information-based ideal points diverge from the voter's preference, and as each diverges, the greater the incongruence between the district's preferences and the legislator's roll call voting record.

To develop hypotheses based on the conditional effects claim, I define conditions in which party and information-based preferences on a committee are likely to be extreme. To capture heterogeneity in party preferences across committees, I use the percentage of committee seats controlled by the majority party. Committee seats are distributed to the parties roughly according to their distribution in the chamber, though the majority party typically "stacks" certain committees to protect the party's preferences (Cox and McCubbins 1993; Jackman 2013; Sinclair 1994). I expect that as the percentage of seats on a committee increases, the more extreme the party's preference is for that legislative jurisdiction.

The relationship between district partisanship and ideology or ideological extremity will be conditioned by the extent to which committee party preferences are outlying; as committee party preferences become more extreme, the relationship between district partisanship and ideology or extremity will weaken due to divergence between the legislator's district voter and the legislator's voting record.

Hypothesis 2a: An increase in percentage of the committee controlled by the majority party will mitigate the relationship between district liberalism and the liberalness of a legislator's roll call voting record when jurisdictional complexity is also high.

Hypothesis 2b: An increase in percentage of the committee controlled by the majority party will mitigate the relationship between district extremity and the extremity of a legislator's roll call voting record when jurisdictional complexity is also high.

Information-induced preferences will also drive legislator roll call voting behavior to diverge from the preferences of their district. Committees on which information induced preferences are likely to be outlying is measured using the number of staff which serve on the committee in a given congress (Olson and Rogowski 2020). An increase in staff indicates the committee deals with greater complexity on issues within its jurisdiction and will produce a divergence between district-based preferences and the legislator's roll call voting record. While information complexity is expected to result in divergence from district preferences, information-induced preferences are not expected to make a legislator more ideologically extreme.

Hypothesis 3: An increase in percentage of the committee controlled by the majority party will mitigate the relationship between district liberalism and the liberalness of a legislator's roll call voting.

Because I do not directly observe party- or information-induced ideal points, I cannot rule out that voter preferences are never exterior to both. This may occur if *both* ideal points are never extreme, or if districts are not sufficiently moderate. For example, information-based preferences may make legislators more moderate, or move their preference in a direction opposite from their party's, which would not produce voting divergence from the median. I consider this unlikely. First party and personal preferences developed from jurisdictional expertise have been shown to be very similar to each other (Krehbiel 1993), making it unlikely a Republican legislator, for example, will develop an information based preference that is liberal. However, if this is the case, then the empirical analyses will not provide evidence for Hypotheses 2a, 2b, and 3.

Varying Ideal Point Weights

I relax the restriction that all three components have equal weights. I am most interested in the conditions under which legislators are responsive to voters so I examine what occurs when the voter's ideal point is weighted more heavily by the legislator. If the weight given to the voter's preference, α=1, then β and $1-\alpha-\beta$ both equal zero. When this is true, $\omega = v_i$ regardless of the location of l_j and d_j. As α decreases, then ω is increasingly affected by the location of l_j and d_j if $v_i > l_j$ and $v_i > d_j$, as shown in the lower panel of Figure 1. If $l_j < d_j$, then ω will move toward l_j, and it will equal l_j if the weights of all three ideal points are the same (as previously discussed).

Thus, an increase in the weight given to the district voter by the legislator will reduce the level of divergence from the voter even as information and partisan preferences move away from the voter. I measure the weight given to a legislator's district median using the incumbent's vote share in the

previous election. As vote share decreases for a legislator, the more they will adhere to the preferences of their constituents. Legislators in districts in which the previous incumbent won a narrow victory indicate that any deviation from the voter's preferences may result in an election loss. Thus, I expect the marginal effect of district partisanship or extremity on roll call voting to be larger when vote share is low.

Hypothesis 4: An increase in incumbent vote share will mitigate the relationship between district liberalism and the liberalness of a legislator's roll call voting.

Measuring Committee Ideology, District Preferences, and Committee Heterogeneity

I estimate a legislator's roll call voting record, ω, using a unique dataset of all standing committee roll call votes from the 104th through 114th Congresses to develop Optimal Classification (OC) scores, at the legislator-committee-congress level. There are some important limitations to the vote data, namely that voice votes and division votes are not recorded, and a few members could not be matched to their voting record because they share the same last name and party as another committee member.[7] These missing values are distributed randomly (as a function of last names) and do not bias the results. A member was not given an OC score if they recorded fewer than ten votes within a committee-congress, and a number of committees do not take sufficient votes within a congress and are missing from the data. Further, while legislator i may cast more than ten votes, an OC score may not be generated if there are not enough other legislators within the committee-congress with which to compare legislator i's voting record. Additional details on the process of collecting committee votes from committee reports for the 104th-114th Congress can be found in (ANONYMIZED, *Legislative Studies Quarterly* 2020). See Table A1 in the Appendix for the number of legislators within each committee-congress who have an OC score.

OC scores are constructed from legislator i's committee-congress roll call voting record. These scores are calculated using the *oc* package in R, an extension of the *wnominate* package (Poole and Rosenthal 2007) and are similar to W-NOMINATE scores but differ in that optimal classification maximizes the correct classification of legislators' choices; it is a "non-parametric procedure that requires no assumptions about the parametric form of the legislators' preference functions, other than assuming

[7] Votes were scraped from committee reports which often only report the legislator's last name, party, and sometimes, state when roll call votes are taken.

that they are symmetric and single-peaked," (Lo 2020, 1, also see Poole 2000). The OC score measures a legislator's ideology based on their roll call voting record within a committee and similar to W-NOMINATE scores, OC scores capture both ideological direction (i.e., liberal or conservative), and ideological extremity (i.e., moderate to extreme). Lower values indicate a more liberal legislator while higher values indicate a more conservative legislator, with the values bounded between -1 and 1.

OC scores are not comparable across congresses or committees because the underlying ideological dimensions are not the same across these settings. To produce a comparable measure, I find the average OC score for each committee-congress, then develop a z-score for each legislator-committee-congress. As the z-score increases, a legislator is more conservative compared to other members on the committee within the same congress. There is evidence that some committees have inherently more partisan agendas than others (Ryan Forthcoming), but standardizing these scores and including committee fixed effects in the empirical models captures these baseline ideological differences. The result is a measure of legislator ideology that can be pooled across committees and congresses.[8] Because most committee votes are partisan, a member casting even a small number of cross-party votes can produce a more moderate OC z-score. See Table A2 for OC z-score summary statistics.

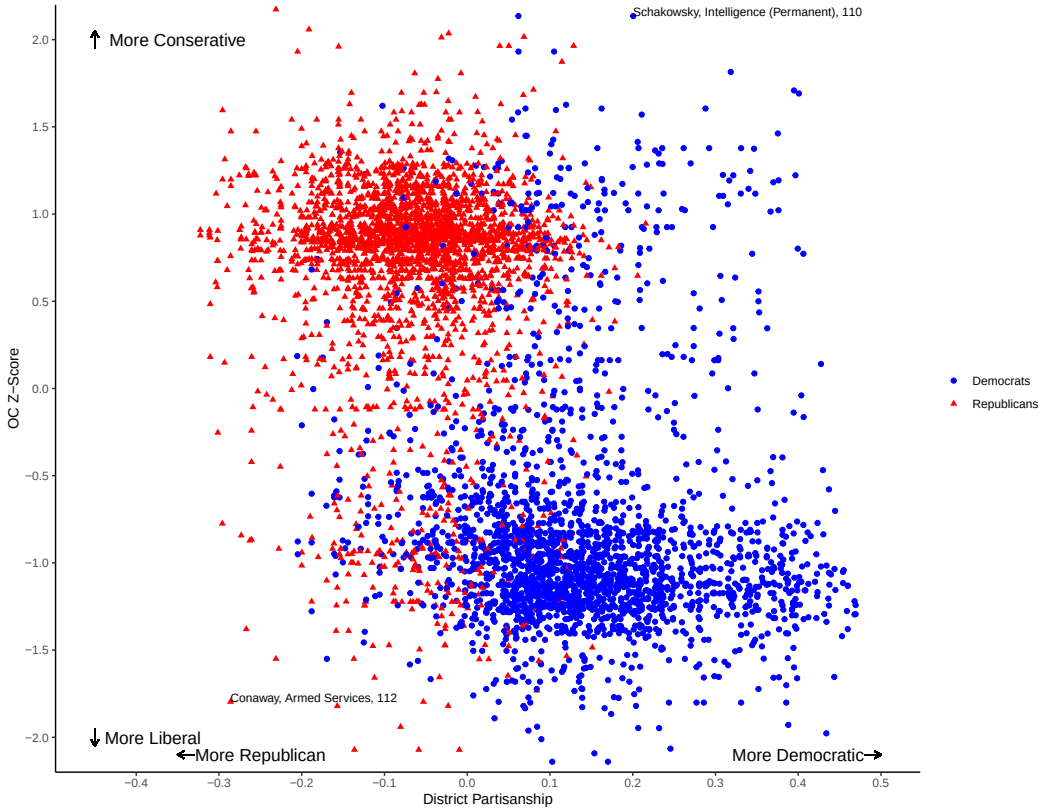
To ensure the results are not an artifact of the OC z-scores I also predict party unity scores. These scores are created for legislator or district i on committee j in congress k using the proportion of times a member votes with their party on roll call votes in which a majority of both parties oppose each other (Carson et al. 2010). Votes which are not party unity votes are not included in the sample. These scores predict partisan extremity, where members from more partisan districts should have a higher party unity score.

The key independent variable in the analysis is a commonly-used measure of a member's district partisanship, the difference in the Democratic candidate's presidential vote share in the previous presidential election from the national average (Carson and Engstrom 2005; Carson, Engstrom and Roberts 2006; Erikson and Wright 1980). Legislators observe this value and gauge the extent to which their district differs from the country as a whole for a given presidential election year cycle. Negative values indicate the district was more Republican than the nation, while positive numbers indicate the district

[8]Fouirnaies and Hall (2018) use a similar research design to compare state legislator behavior across years and states. They do not construct z-scores however, and claim that by fixing effects by state allows for comparability of W-NOMINATE estimates. This is true if the votes taken in each state legislature-year are in the same ideological space and if differences across them are a function of a constant. In my case, the underlying ideological spaces across committees are not identical because the jurisdictions differ, and the assumption that comparisons across committees and congresses are only a function of a constant is likely not met.

was more Democratic. I also take the absolute value of district partisanship as an indicator of district extremity.[9]

Figure 3: Scatter Plot of District Partisanship and OC Z-Score by Legislator Party, 104th-114th Congresses



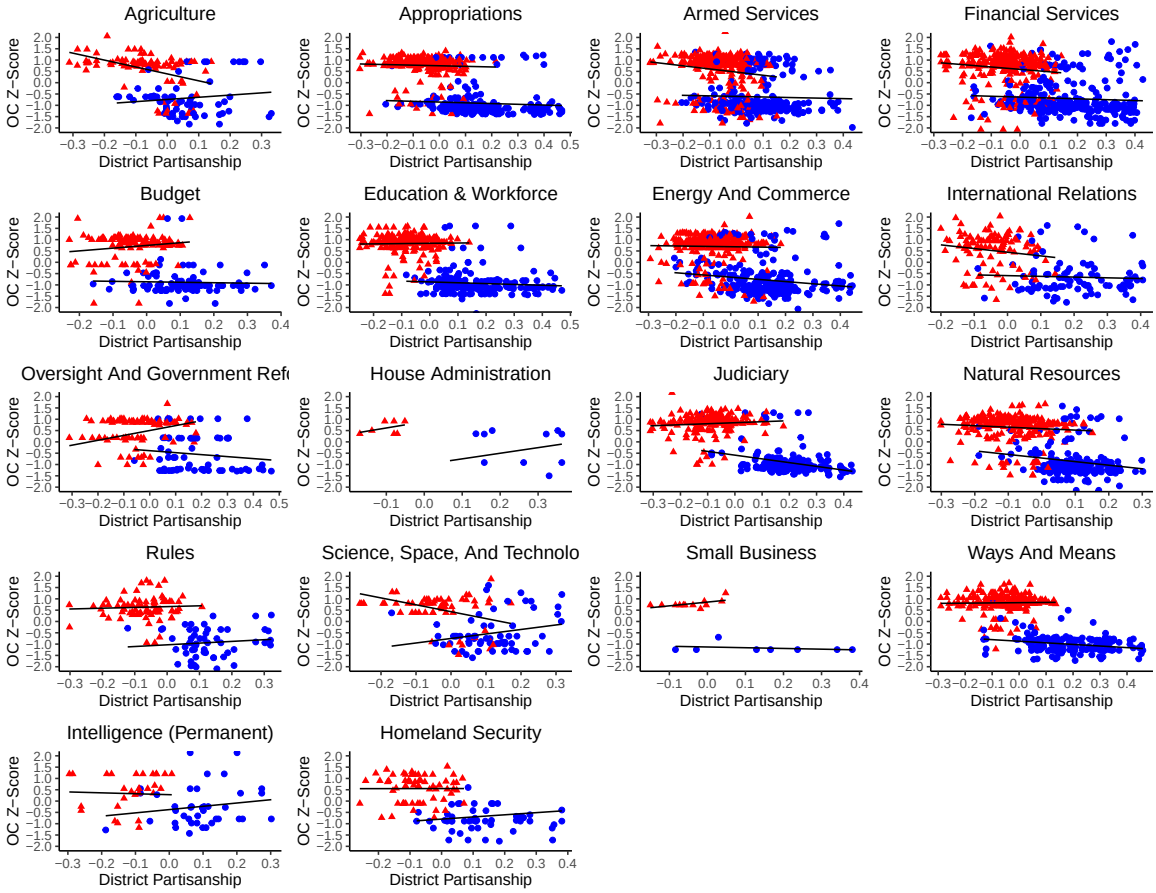
Note: Points are legislator-committee-congress in 104th-114th Congresses. Some outlying district-assignments are omitted if their OC z-score is greater than two or less than -2.

Figure 3 shows a scatter plot of OC z-scores for all legislator-committee-congresses. The x-axis is district partisanship where lower values indicate a more Republican district, and the y-axis shows OC z-scores increasing from most liberal to most conservative. As the plot shows, Democrats and Republicans exhibit markedly different roll call voting behavior, as expected, with Republicans being far more conservative, on average. There is substantial variation within the parties, however, with some Democrats having conservative OC z-scores and some Republicans having liberal OC z-scores. For example, Michael Conaway's (TX-11) OC z-score on Armed Services in the 112th Congress is notable for being among the most liberal, despite having a very conservative district. Conversely, Jan Schakowsky compiled a very conservative voting record on Intelligence in the 110th Congress despite

[9]Kernell (2009) uses a Bayesian estimate of multiple election returns to produce a modified measure of district partisanship. While this measure is useful for capturing the longer-term inherent partisanship of a district, I assume that legislators base their behavior on the most recent observable data they have access to: the previous presidential election result in their district. The results using the Kernell measure are very similar to those shown here.

representing a relatively Democratic district.

Figure 4: Scatter Plot of District Partisanship and OC Z-Score by Legislator Party, 104th-114th Congresses



Note: Points are district-assignments by committee in 104th-114th Congresses. Some extreme district-assignments are omitted if their OC z-score is greater than two or less than -2.

Figure 4 shows the same scatter plots separated by committee, along with bivariate regression lines for each party. Because an increase on the x-axis is an increase in district Democratic presidential vote share and an increase on the y-axis is a more conservative voting record, for both parties the line should show a negative relationship. While this relationship is seen in some committees, the ideological differences between Republicans and Democrats are consistent across committees lending validity to the dependent variable.

Measures of Committee Heterogeneity

The theoretical expectations are that heterogeneity in committees along party- and information-based dimensions will affect the relationship between district preferences and committee voting. Measures of committee heterogeneity must capture party preferences and the committee's jurisdictional

complexity. Because the models predict voting behavior, the measures must also be exogenous and causally prior to committee votes.

I use the percentage of seats on committee j in congress k which are controlled by the majority party as a proxy for party preferences on the committee. Larger majority party sizes pull the committee median toward the party median (Wiseman and Wright 2008) and indicate the majority party wants to move outcomes toward the ideological edge. In short, committees stacked with majority party members are those in which both majority and minority party members are likely to be pressured by their party to enact outlying policy (though the role of minority party members is to limit policy gains by the majority).[10] The variable is a continuous measure of the extent to which unobserved party preferences are extreme. The correlation between the percentage of majority party seats on the committee and the party-committee DW-NOMINATE score is -.35 for Democrats and .1 for Republicans (negative DW-NOMINATE scores indicate liberalness).[11] In the sample, the share of majority party control ranges from .53 on International Relations in the 108th Congress, to .692 on the Rules Committee in the 113th, values which correspond to expectations on which committees are likely to have moderate party preferences (International Relations), and extreme party preferences (Rules).

To measure jurisdictional issue complexity and the capacity of the committee to induce information-based preferences, I use the logged number of committee staff for committee j in congress k.[12] Staff resources vary between committees and across congresses, with a minimum of 28 on the Rules Committee in the 114th Congress, and a maximum of 156 on the Appropriations Committee in the 104th Congress, consistent with expectations about the relative complexity of each committee's jurisdiction. For robustness checks, I also use the raw number of committee staff, and find each committee's percentage of total staff across all committees in congress k, as staff numbers have declined over the years, though these alternative measures do not affect the results.

[10]Conversely, while legislators serving in committees with narrow majorities may be pressured to vote the party line, parties almost certainly avoid placing legislators with moderate constituencies on committees where they will have to be a crucial vote on committee matters.

[11]The correlation for Republicans is somewhat weak, but these are DW-NOMINATE scores which capture overall ideology across all issues within a congressional term and may be of limited applicability for committee preferences. Further, the correlations do not account for heterogeneity across committees or congresses.

[12]The data is taken from CRS reports and lists staff totals every year. I find the average across the two years within a congress.

Estimation Strategy for Predicting Committee Voting

Because I observe members and districts across time, I can measure changes in representation behavior using a two-way fixed effects model. The estimation strategy requires that panel values are unique within time periods (congressional term), which is not the case for legislators because they often serve on more than one committee within a congress (and similarly, districts are represented on more than one committee.). To create appropriate panels, I construct legislator- or district-assignment level data so that while each legislator/district has multiple assignments within a congress, each assignment identifier occurs only once within a congress.[13] For example, if legislator i serves on two committees within a congress, the units are legislator/district i-assignment one and legislator/district i-assignment two. When a legislator leaves a committee to join a new one, the assignment number moves to the new committee. If the legislator leaves one committee and remains on a second committee, the assignment number of the committee they left moves to the subsequent committee while the assignment number of the committee on which they stayed remains the same. Thus, the panel units are district/legislator assignment-committee-congress. Legislator-assignment fixed-effects identify the model based on within-legislator changes, while (separately) district-assignment fixed-effects identify the model based on within-district changes.

In addition to district/legislator-assignment fixed effects, the models also include committee and congress fixed effects to control for baseline committee differences that do not vary (such as committee value (Groseclose and Stewart 1998)), and for time-varying characteristics of Congress such as the increase in partisan polarization. To summarize, I estimate the following panel regression models:

$$\begin{aligned} \hat{y}_{ijt} = \alpha_{ij} + \delta_t + \gamma_j + \\ \beta_1 D_{it} + \varepsilon_{ijt} \end{aligned} \tag{3}$$

where the outcome is legislator/district$_i$ OC z-score or absolute OC z-score on committee j in congress t, α_{ij} is either a legislator- or district-assignment fixed effect, δ_t is congress fixed effects, γ_j are committee fixed effects, D is a continuous variable for absolute district partisanship or district partisan-

[13] No legislator has no more than three assignments per congress. About 58% of assignments are the legislator's only assignment, 35% are a second assignment, and about 7% are a third assignment. Both parties have rules about the number of committees a legislator can serve on, and legislators serving on three committees are likely serving on two low-valued committees, while legislators serving on one committee have one prestige assignment.

ship, and ε_{ijt} standard errors clustered on either legislator or district. I also estimate models with committee-by-congress fixed effects to control for variation at the committee-congress level, and the district-assignment fixed effects models also control for party to estimate the effect of partisan orientation on committee voting.[14] As a robustness check, I also estimate first-differences models where $\hat{y} = y_{ijt} - y_{ijt-1}$ and $D = D_{it} - D_{it-1}$, and α_{ij} is not included.

Leveraging Exogenously Imposed District Changes to Predict Committee Voting

In a second set of analyses, I conduct a natural experiment using the redistricting process to predict changes in OC scores before and after new lines are drawn, as district partisanship post-redistricting is seen as exogenous to a member's previous representation style (Bertelli and Carson 2011; Carson et al. 2007; Glazer and Robbins 1985; Lo 2013). I develop a similar strategy here using changes in OC score from the two redistricting cycles included in the committee votes data (the 2000 cycle, 107th-108th Congresses, and the 2010 cycle, 112th-113th congresses).[15]

As described above, OC scores should not be compared across congresses because the underlying ideological dimensions may differ. However, Poole (2005) and Poole et al. (2007) describe a process that approximates a natural experiment by allowing legislator i to shift positions, while constraining all other legislators to have one ideal point across both congresses. To do this, all legislators which sit on the same committee in the pre- and post-redistricting congresses are selected into the dataset. For each legislator i, an OC score is found in the pre- and post-redistricting congresses, while one ideal point is found for all other legislators using their roll call voting record in both congresses. This allows, according to Lo, to hold "the scale and rotation of the ideological space constant over time [9]."

Though the technique allows for the comparisons of OC scores across congresses, I still cannot compare them across committees, and as a result I use OC z-scores as the dependent variable. The treatment effect of redistricting for each legislator is the change in their OC z-score between the two congresses, pre- and post-redistricting, accounting for party, redistricting cycle, and committee assignment.

[14] Party is not included in the legislator-assignment fixed effects models because it does not change over time.

[15] OC scores are not a statistical estimate and thus do not have uncertainty associated with them, though bootstrapped standard errors can be found to determine how stable they are. Because I am predicting OC scores, I do not estimate uncertainty around them, conceptualizing instability as measurement error.

The Effect of District Partisanship on Committee Roll Call Voting

Table 1 shows six different models predicting ideology (models 1 through 3) and absolute ideology (models 4 through 6), developed from roll call votes. The dependent variable in models 1-3 has both a directional component (liberal or conservative, compared to other members), and captures the degree of ideological extremity, with smaller negative values and larger positive values indicating a more liberal or conservative member, respectively. District Democratic presidential support is measured such that increasing values indicate more liberal districts and should have a negative coefficient. The models are panel linear regression with two-way fixed effects for district-assignment, congress, and committee separately, or committee-by-congress (models 2 and 5). Models 3 and 6 are first differences which also include fixed effects for committee and congress. Finally, models 4-6 also control for party of the representative as asymmetric polarization has made Republicans more extreme than Democrats, on average (Butler 2009). These models identify the effects of district partisanship on roll call voting using changes within districts across time.

Table 1: District-Assignment Estimates for Ideology, 104th-114th Congresses

	DV=Ideology			**DV=Absolute Ideology**		
	(1)	(2)	(3)	(4)	(5)	(6)
District Dem. Presidential Support	-3.41*	-3.45*	-2.37*			
	(0.293)	(0.299)	(0.470)			
Absolute Dem. Pres. Support				0.587*	0.581*	0.383
				(0.124)	(0.122)	(0.213)
Legislator Party (GOP=1)				-0.066*	-0.065*	-0.044*
				(0.023)	(0.024)	(0.010)
District-Assignment Fixed Effects	Yes	Yes		Yes	Yes	
Committee Fixed Effects	Yes		Yes	Yes		Yes
Congress Fixed Effects	Yes		Yes	Yes		Yes
Committee x Congress Fixed Effects		Yes			Yes	
First Differences			Yes			Yes
No. of Unit Fixed Effects	983	983		983	983	
R-Squared	0.316	0.312	0.024	0.044	0.071	0.434
N	5,162	5,162	3,332	5,162	5,162	3,332

Note: *p<.05. Models are panel linear regression where the dependent variable is a district's ideology z-score on committee *j* in Congress *k* (models 1-3), or a district's absolute ideological z-score (models 4-6). Number of unit fixed effects indicate number of observed districts. Standard errors clustered by district (number of clusters equals number of unit fixed effects, in models 3 and 6 number of clusters is 740).

In each of the first three models the estimates for district partisanship are negative and statistically significant, consistent with Hypothesis 1A: as districts become more Democratic, member OC z-scores become liberal. Because the dependent variable is OC z-score within a committee-congress, it does

not have an intuitive substantive interpretation, but in model 1 moving from the minimum to maximum value on district Democratic support produces an ideology that is about 2.73 standard deviations more liberal (95% CI: 2.27 SDs to 3.20 SDs). The estimated coefficients in models 2 and 3 show similar substantive effects.

Models 4 through 6 estimate the effect of absolute district Democratic presidential support on ideological extremity (Hypothesis 1B). More partisan districts, for members of both parties, are a significant predictor of ideological extremity in committee voting; increasing absolute district presidential support from the minimum to the maximum produces a change in OC z-score of about .76 standard deviations (95% CI: 0.45 SDs to 1.08 SDs) in model 4. Model 6, estimated using first differences rather than two-way fixed effects, is not quite statistically significant (p=.07), and the substantive effect is slightly smaller than that estimated by model 4, with a change of .58 standard deviations (90% CI: 0.49 SDs to 1.12 SDs). Party is also a significant predictor of extremity in all models. The negative coefficient in model 4 indicates Republicans are about .18 standard deviations more extreme than Democrats (95% CI: .05 SDs to.31 SDs).

In Table 2, OC z-score is predicted using changes within legislators across time, showing the extent to which members change their roll call voting behavior to match changing district preferences. The models use the same two-way fixed effects and first differences specifications as in the district-assignment estimates. Neither district Democratic presidential support nor absolute Democratic support are statistically significant, indicating that changes in district partisanship at the legislator level do not result in corresponding changes in roll call voting. It is unsurprising that party does not have a significant result as members rarely change their party identification. The results for party unity in Appendix B are nearly identical, with an increase in party unity driven by an increase in absolute district partisanship when identified using member fixed effects, but not when identified using district fixed effects.

The combined results from the district-level and legislator-level models suggest that while district characteristics affect roll call voting behavior, this relationship is due to changes in district representation, not changes by legislators to better represent their districts. That is, across districts, the voting behavior of the representative matches the district's preferences. But, within districts, individual legislators do not change their voting behavior to match the district, even as the preferences of their district evolve, consistent with Hypothesis 1C and with previous research on congressional floor voting. Districts are well represented by their legislators, but because they elect members who represent them, not

Table 2: Legislator-Assignment Estimates for Ideology, 104th-114th Congresses

	DV=Ideology			DV=Absolute Ideology		
	(1)	(2)	(3)	(4)	(5)	(6)
District Dem. Presidential Support	-0.128	-0.147	0.177			
	(0.351)	(0.355)	(0.458)			
Absolute Dem. Pres. Support				0.174	0.213	0.042
				(0.155)	(0.155)	(0.243)
Legislator Party (GOP=1)				0.635	0.736	
				(0.542)	(0.591)	
District-Assignment Fixed Effects	Yes	Yes		Yes	Yes	
Committee Fixed Effects	Yes		Yes	Yes		Yes
Congress Fixed Effects	Yes		Yes	Yes		Yes
Committee x Congress Fixed Effects		Yes			Yes	
First Differences			Yes			Yes
No. of Unit Fixed Effects	1,742	1,742		1,742	1,742	
R-Squared	0.004	0.032	0.028	0.823	0.140	0.425
N	5,162	5,162	3,002	5,162	5,162	3,002

Note: *p<.05. Models are panel linear regression where the dependent variable is a legislator's ideology z-score on committee *j* in Congress *k* (models 1-3), or a legislator's absolute ideological z-score (models 4-6). Number of unit fixed effects indicate number of observed districts. Standard errors clustered by legislator (number of clusters equals number of unit fixed effects, in models 3 and 6 number of clusters is 740). In model 6 legislator party cannot be estimated because it does not change within legislator across time.

because members adapt their behavior over time.

Redistricting Effects on Committee Roll Call Voting

I use redistricting as a natural experiment to conduct a second analysis of whether district changes from redistricting produce commensurate changes in roll call voting within committees by creating OC z-scores for legislator *i* pre- and post-redistricting while other members are pooled across congresses.

The first four models in Table 3 use district Democratic presidential support (models 1-2) and absolute district Democratic presidential support (models 3-4) to predict OC z-scores for members in the 108th and 113th Congresses, after each redistricting cycle when exogenous changes to district partisanship occur. District Democratic presidential support is negative and significant, indicating that post-redistricting, legislators from more Democratic districts have more liberal voting records. Likewise, an increase in absolute district Democratic presidential support results in a more ideologically extreme roll call voting record. The substantive effects for district Democratic support are very similar to those previously estimated from the two-way fixed effects models, while the point estimates for absolute district support are slightly smaller, an increase in a member's z-score of about .46 of a standard deviation (95% CI: to .07 SDs to .85 SDs) in model 3.

Table 3: Predicting OC Z-Scores Using Redistricting

	Post-Redistricting				Redistricting Change			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
District Dem. Presidential Support	-3.39*	-3.39*			-0.01	-0.01		
	(0.208)	(0.209)			(0.006)	(0.006)		
Absolute Dem. Pres. Support			0.359*	0.347*			-0.228	-0.311
			(0.157)	(0.155)			(0.551)	(0.480)
Legislator Party (GOP=1)			-0.209*	-0.208*			-0.133*	-0.130*
			(0.029)	(0.030)			(0.042)	(0.041)
Committee Fixed Effects	Yes		Yes		Yes		Yes	
Redistricting Cycle Fixed Effects	Yes		Yes		Yes		Yes	
Redistricting x Committee Fixed Effects		Yes		Yes		Yes		Yes
R-Squared	0.274	0.274	0.162	0.177	0.004	0.004	0.201	0.278
N	776	776	674	674	737	737	737	737

Note: *p<.05. Models are linear regression where the dependent variable is a member's OC z-score on committee *j* in Congress *k* (models 1-2), absolute z-score (models 3-4), change in OC z-score (models 5-6), or change in absolute member ideological z-score (models 7-8). Standard errors clustered by member (595 clusters in models 1 and 2, 595 clusters in models 3 and 4, 564 clusters in models 5-8).

Models 5 though 8 estimate changes in OC z-scores from the pre-redistricting to the post-redistricting congresses. If legislators change their behavior based on district changes, both district partisanship and absolute presidential support would be statistically significant, which is not the case. In models 7 and 8, the coefficients are negative, the opposite direction from expectations, and not significant. Legislator party is significant in these models however, providing additional evidence that Republican members are more extreme in their committee voting behavior than Democrats.

The results of these analyses support the claim that most districts are well represented in committee roll call voting. More liberal districts have members who produce more liberal voting patterns, for example, and more partisan districts have members who develop extreme voting records, consistent with Hypotheses 1A and 1B. High quality representation is a function of legislators who are well aligned with their district when elected, rather than flexible in their behavior. Even after redistricting, most districts do not change substantially, and as a result, inflexible members still represent their district well. But, for those districts which do change over time, legislators become increasingly out-of-step with their voters, consistent with Hypothesis 1C.

Committee Heterogeneity and Committee Roll Call Voting

The theory also suggests that differences across committees based on majority party preferences and information-induced preferences will condition the relationship between district partisanship and roll call voting. As these ideal points diverge from the preferences of the district median voter, the effect

of district partisanship on a legislator's roll call voting record will decline. Further, outlying partisan committee preferences will only matter when information-induced preferences are also outlying (and vice versa). I interact the percentage of the committee seats controlled by the majority party and the number of committee staff (logged) with district or absolute district partisanship. The marginal effect of district partisanship should weaken as each variable increases, holding the other at its maximum.

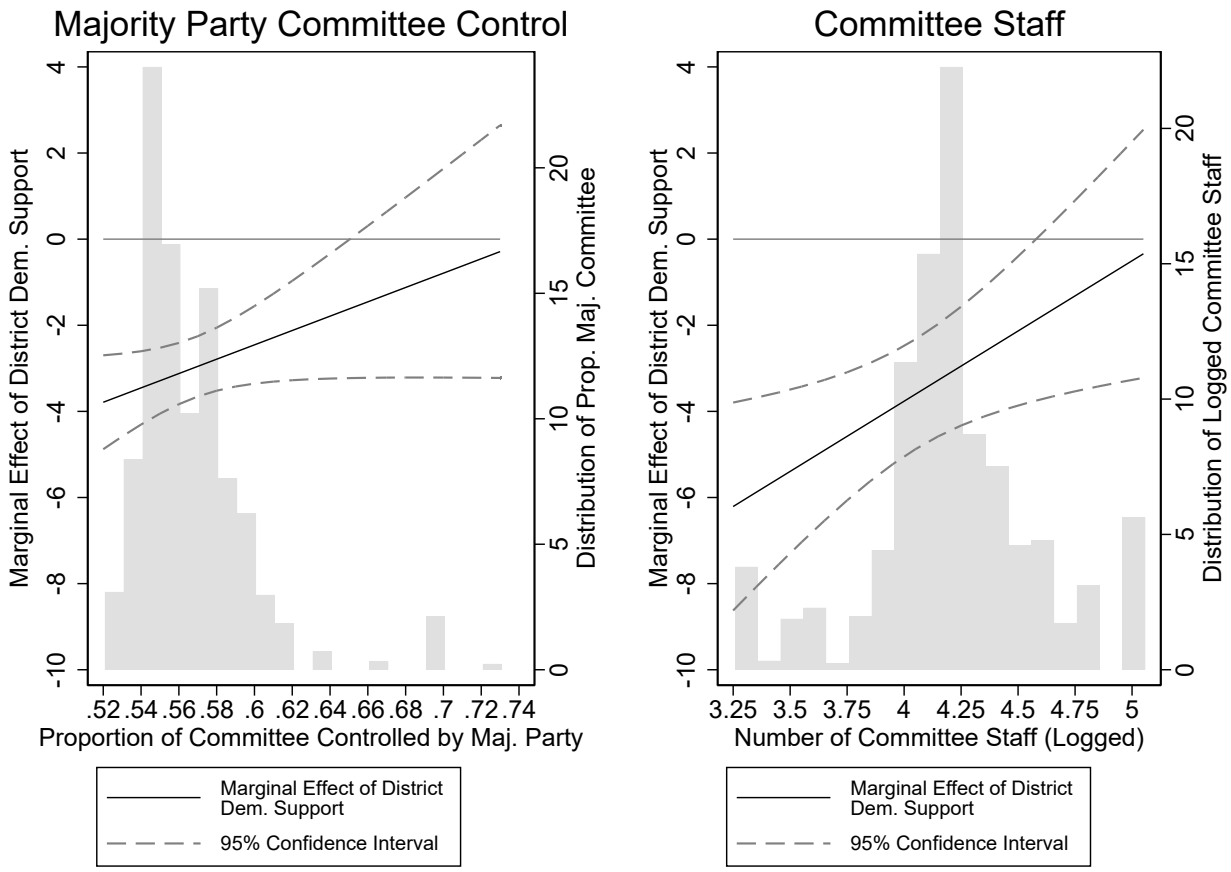
The models are again two-way fixed effects estimating OC z-scores and absolute z-scores, with fixed effects for committees and congress, and (separately) committee-by-congress, with clustered standard errors by district. Because the committee variables are constant within committees, but vary across congresses, I cannot use the committee-by-congress level fixed effects, so results are shown only for models with committee and congress fixed effects estimated separately.

To substantively interpret the effects of the three-way interaction term predicting OC z-scores, Figure 5 shows the marginal effects of district Democratic presidential support (coefficients table shown in Appendix C1). In the left panel, the effect of district partisanship on committee ideology is negative and statistically significant when the committee has a low number of majority party members. Consistent with theoretical expectations, when the party division on a committee is narrow, legislators in more Democratic (Republican) districts develop roll call voting records that are increasingly liberal (conservative), evidence that their representation is responsive to district preferences. But, as party strength on the committee grows and preferences become more outlying, the marginal effect increases and is not significantly different from zero, "breaking" the relationship between district characteristics and representation. As the committee's majority party preferences become more extreme, legislators from both parties are not responsive to their constituents' preferences, as predicted by Hypothesis 2A.

A similar effect for committee staff is seen the right panel of Figure 5. As committee staff increases, the relationship between district partisanship and ideology moves toward zero, and in committees with the greatest number of staff, there is no relationship between the two. In both panels, the maximum and minimum marginal effects are statistically distinct from each other at the .07 level for proportion of the committee controlled by the majority party and the .02 level for committee staff. These results confirm Hypotheses 2a and 2b; legislators represent their districts well in committee voting, but the quality of representation declines if the committee induces preferences that are not well-aligned with district voters.

The results for absolute district partisanship show a significant marginal effect for percentage of the majority party controlled by the majority party (Hypothesis 3), but not for committee staff. As shown

Figure 5: Marginal Effect of District Partisanship Conditional on Percentage of Committee Seats Controlled by Majority Party and Committee Staff



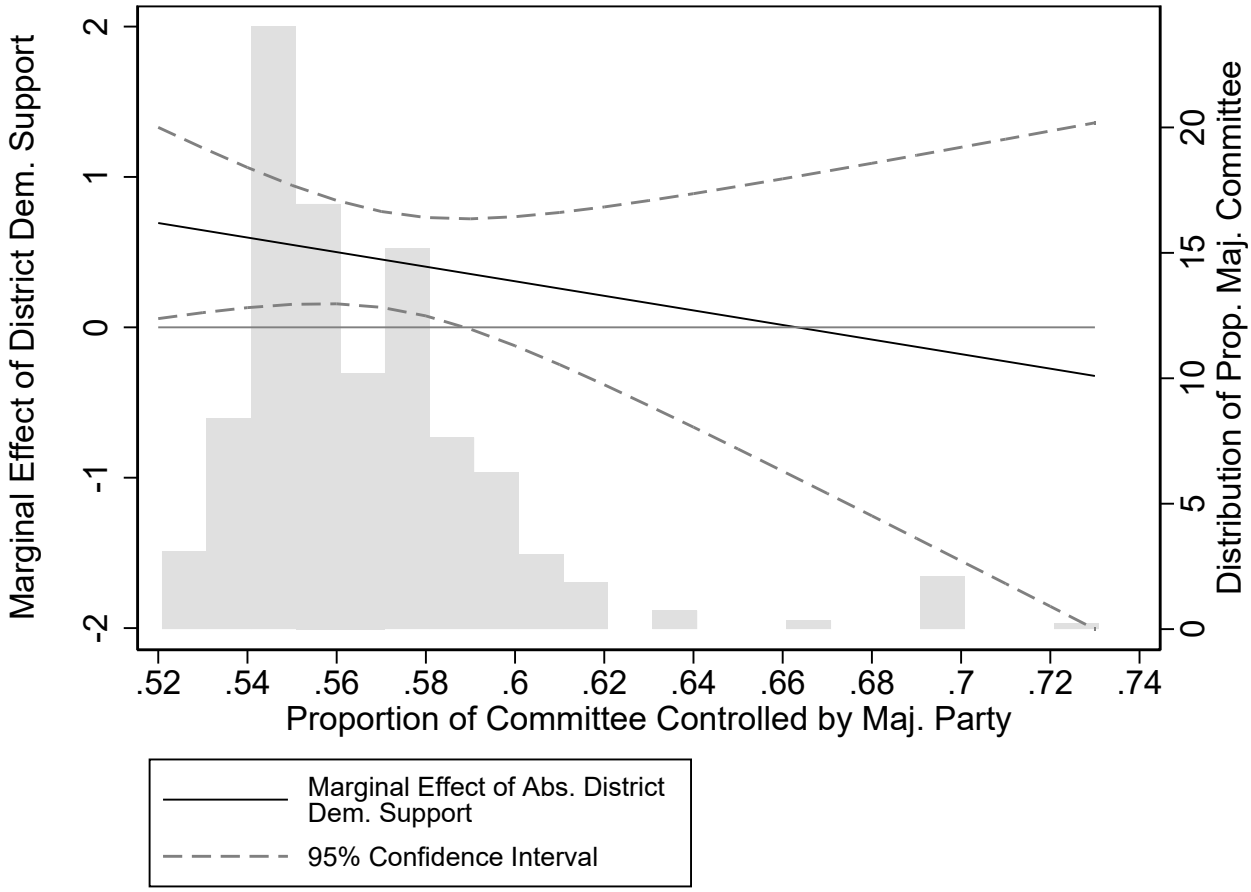
Note: Predicted probabilities from model 1 in Table C1. The left y-axis is the marginal effect of district partisanship, and the x-axis is the value of percentage of committee controlled by majority party (left panel) or the number of logged committee staff (right panel). The right y-axis in both graphs is the density of percentage of the committee controlled by the majority party (left panel) or logged committee staff (right panel). Wald chi-square test indicates maximum and minimum marginal effects are statistically different from each other, χ^2=3.46, p=0.07 in the left model and χ^2=6.16, p=0.02 in the right model.

in Figure 6, when the proportion of the committee controlled by the majority is low, the effect of absolute district partisanship on extremity is .69, indicating that a one unit increase in absolute district partisanship of about 1.91 standard deviations (95% CI: .16 SDs to 3.67 SDs). As the percentage of the majority party on the committee increases to its maximum, however, the effect of absolute district partisanship on ideological extremity becomes negative and statistically indistinguishable from zero, reflecting no relationship between the two.

As expected, there are no significant results for absolute district partisanship on committee extremity, conditional on committee staff. Overall, the results demonstrate that district partisanship affects members' roll call voting record in standing committees, but that relationship is conditioned by outlying partisan and information preferences produced by the committees. As committee characteristics

exert pressure on legislators to diverge from their district preferences, they may not provide substantive representation, especially if the committee has outlying preferences on *both* dimensions. This is also true for ideological extremity, though only committees with outlying partisan-based preferences produce a statistically significant effect on extremity.

Figure 6: Marginal Effect of Absolute District Partisanship Conditional on Percentage of Committee Seats Controlled by Majority Party



Note: Predicted probabilities from model 2 in Table C1. The left y-axis is the marginal effect of district partisanship, and the x-axis is the value of percentage of committee controlled by majority party. The right y-axis is the density of percentage of the committee controlled by the majority party.

The Conditional Effect of Incumbent Vote Share

In the final set of analyses, I use incumbent vote share in the previous district election to measure the extent to which a legislator weights the preferences of their district voters. The theory predicts that as vote share declines, the legislator will more closely adhere to their district voter's preferences, and the negative effect of district Democratic presidential support on conservative ideology will be strengthened. The models are again two-way fixed effects predicting ideology and absolute ideology,

with additional controls for proportion of the committee controlled by the majority party and committee staff (logged).

The results are shown in Appendix Table C2 and marginal effects for district and absolute district Democratic presidential support are shown in Figure 7. As the left panel shows, when incumbent vote share is small, the relationship between district Democratic presidential support and roll call voting ideology is very strong, with a marginal effect of -4.29 (95% CI: -3.54 to -5.04). This is a large substantive change of 3.44 standard deviations in ideology. When incumbent vote share is at the maximum of 100 (incumbents who ran unopposed), the effect of district Democratic presidential support is still negative and statistically significant, but much smaller at -2.69 (95% CI: -2.02 to -3.36). These coefficients are statistically different from each other (p=.0001) indicating that the relationship between district Democratic presidential support and ideology is substantially weaker when the incumbent receives a large vote share, though notably, their roll call voting behavior is still consistent with the district's preferences

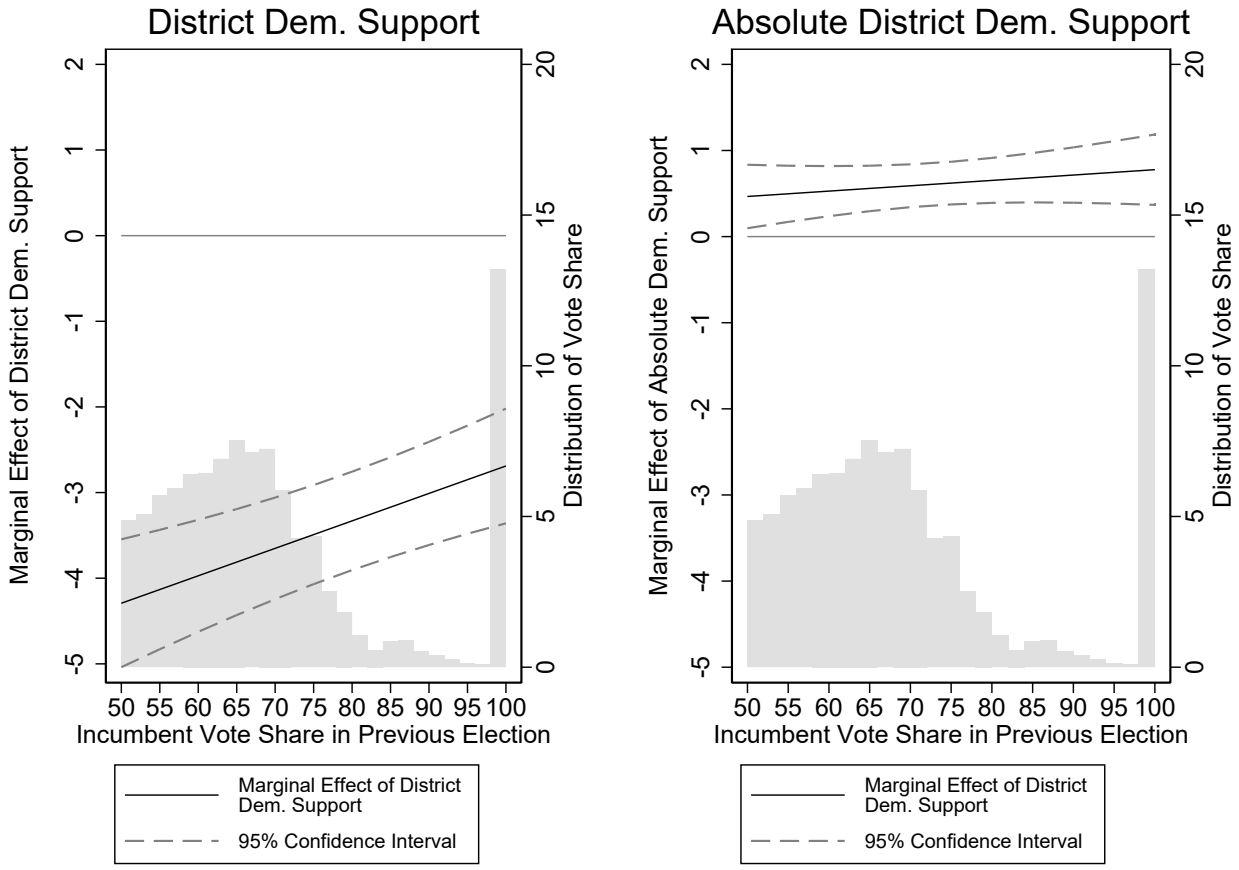
The right panel shows the relationship between absolute Democratic support and absolute ideology, varying vote share. The relationship between these two variables is expected to be positive, and as vote share increases, the relationship between the two should approach zero. As the graph shows, there is no change in the relationship between district partisanship and legislator extremity as vote share increases. The relationship is always positive and the marginal effects at the minimum value of vote share and the maximum value are not statistically different from each other.

While legislators are more sensitive to the ideological preferences of their district when they are electorally weak, their ideological extremity adheres to district preferences and is not affected by their previous vote share. In short, voting extremity is driven by constituent preferences and by party preferences, but electorally tenuous and safe members are equally as responsive to their district when it comes to their roll call voting extremity.

Discussion

The extent to which legislators represent their constituents' preferences is a fundamental question in republican government. The research on whether Representatives reflect the wishes of their constituents on floor votes shows that by and large, they do. Floor votes are highly visible to voters, the media, and interest groups, and even a single bad vote can doom a legislator's reelection chances. The

Figure 7: Marginal Effect of District Partisanship Conditional on Incumbent Vote Share



Note: Predicted probabilities from models 1 and 2 in Table C2. The left y-axis is the marginal effect of district Democratic support or absolute support, and the x-axis is the vote share received by the incumbent in the district in the previous election. The right y-axis in both graphs is the density of vote share. Wald chi-square test indicates maximum and minimum marginal effects are statistically different from each other in the left panel, χ^2=14.46, p=0.0001. The minimum and maximum marginal effects are not different from each other in the right panel, χ^2=1.03, p=0.309.

ability of these audiences to monitor committee behavior is much weaker, and importantly, committees are the institutional venue where much of the work of developing legislation is done. This may give lawmakers the opportunity to shirk voter preferences and avoid electoral sanction.

The theory and results support the claim that most Representatives, most of the time, represent their districts well on committees. The effects of district partisanship on roll call voting are substantively meaningful and consistent across estimation strategies and specifications. The findings emphasize that most legislators walk a fine line when representing their districts on committees; even voting differently from extremists on a handful of votes produces a much more centrist voting record.

This research also engages with the recent debate on transparency in congressional activity. While committee votes are "publicly" available, they are not easy to access for congressional observers or the public. While Congress has indicated it wants to make these data more publicly available, including

the creation of the Select Modernization Committee, no concrete steps have been taken. The suggestion by the Modernization committee that Congress create, "One-click access to see how Members of Congress vote in committees." has been met with some skepticism. Some observers believe this will only increase political polarization as legislators become more beholden to their constituents if their voting behavior is public. While the results here do not speak directly to the effects more transparent committee voting might have on polarization, they do suggest that for the most part, legislators already represent their constituents well in their committee voting.

With respect to polarization, deviation from district preferences on ideological extremity is largely driven by extreme partisan preferences on certain committees. If the member serves on a committee which has extreme party preferences, they are increasingly likely to develop an ideological voting record which does not correspond to the preferences of their district. While I do not observe the House prior to the polarized period, the results suggest that for moderate districts, representation quality is becoming worse, regardless of the level of transparency of legislators' voting behavior.

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Appendix

Appendix A: Descriptive Statistics

Table A1: Number of Legislators With an OC Score by Committee and Congress, 104th-114th Congresses

	Congress											
	104	105	106	107	108	109	110	111	112	113	114	Total
Agriculture	42	0	0	0	0	0	0	32	42	42	0	158
Appropriations	53	58	59	63	64	0	0	57	48	53	48	503
Armed Services	50	44	51	50	52	0	59	59	58	60	60	543
Budget	40	20	41	40	42	6	0	0	30	0	0	219
Education and the Workforce	40	41	46	48	45	45	42	43	38	38	33	459
Energy and Commerce	45	42	47	52	50	51	52	55	53	51	53	551
Financial Services	44	51	54	63	57	59	65	64	48	57	55	617
Homeland Security	0	0	0	8	0	28	0	24	28	0	28	116
House Administration	0	0	0	0	0	6	8	4	0	0	0	18
Intelligence (Permanent)	0	0	0	0	17	16	16	21	0	0	0	70
International Relations	38	0	0	35	42	42	0	0	37	0	0	194
Judiciary	32	33	34	35	37	39	39	38	37	35	31	390
Natural Resources	44	36	41	46	23	17	43	43	41	39	37	410
Oversight and Government Reform	46	0	0	0	35	0	0	0	36	0	34	151
Rules	13	12	12	13	12	11	11	13	12	12	13	134
Science, Space, and Technology	48	0	18	0	24	0	0	0	0	0	32	122
Small Business	0	0	0	0	0	0	0	0	20	0	0	20
Transportation and Infrastructure	55	0	0	0	0	0	0	0	0	46	0	101
Ways and Means	34	20	35	36	38	37	38	38	36	35	39	386

Note: Members do not receive an OC score if they voted fewer than ten times on committee j in congress k. Some committees excluded if they have no observations across all congresses (e.g., Veterans' Affairs).

Table A2: Summary Statistics of OC Z-Scores and by Congress and Committee

	Minimum	1st Quartile	Median	3rd Quartile	Maximum
Overall					
	-5.66	-1.01	0.28	0.88	4.05
By Committee					
Agriculture	-1.41	-1.07	0.58	0.91	1.40
Appropriations	-1.41	-1.07	0.58	0.91	1.40
Armed Services	-1.98	-0.97	0.25	0.91	2.25
Budget	-1.82	-1.03	-0.12	0.87	1.97
Education and the Workforce	-2.26	-1.07	0.46	0.88	1.61
Energy and Commerce	-2.07	-1.03	0.30	0.86	2.0
Financial Services	-2.07	-0.96	0.23	0.90	2.01
Homeland Security	-1.77	-0.85	-0.11	0.85	3.45
House Administration	-2.47	-0.60	0.36	0.50	0.91
Intelligence (Permanent)	-3.46	-0.79	-0.24	0.55	2.14
International Relations	-2.42	-0.97	-0.08	0.94	2.04
Judiciary	-1.55	-1.09	0.47	0.87	2.17
Natural Resources	-2.14	-1.00	0.42	0.87	1.67
Oversight and Government Reform	-5.66	-0.73	0.17	0.85	1.68
Rules	-2.09	-0.76	0.30	0.68	2.57
Science, Space, and Technology	-1.60	-0.92	0.31	0.79	4.05
Small Business	-1.24	-1.24	0.72	0.72	1.26
Transportation and Infrastructure	-1.94	-1.19	0.40	0.65	1.47
Ways and Means	-2.35	-0.94	0.51	0.89	1.70
By Congress					
104	-1.98	-1.03	0.45	0.85	1.96
105	-2.26	-1.03	0.37	0.87	2.02
106	-1.95	-1.06	0.29	0.89	1.67
107	-2.42	-1.04	0.34	0.90	2.25
108	-2.42	-1.02	0.29	0.88	4.05
109	-3.46	-1.10	0.50	0.85	1.78
110	-2.47	-0.92	-0.53	1.09	2.14
111	-1.96	-0.88	-0.56	1.16	2.06
112	-1.83	-1.13	0.60	0.84	1.93
113	-1.94	-1.12	0.46	0.80	2.57
114	-5.66	-1.09	0.18	0.84	3.45

Note: OC z-scores shown for the entire sample, by committee, and by congress. Because these are z-scores, mean is approximately zero for all rows.

Figure A1: Density of Democratic Presidential Support for Districts Used in Analysis

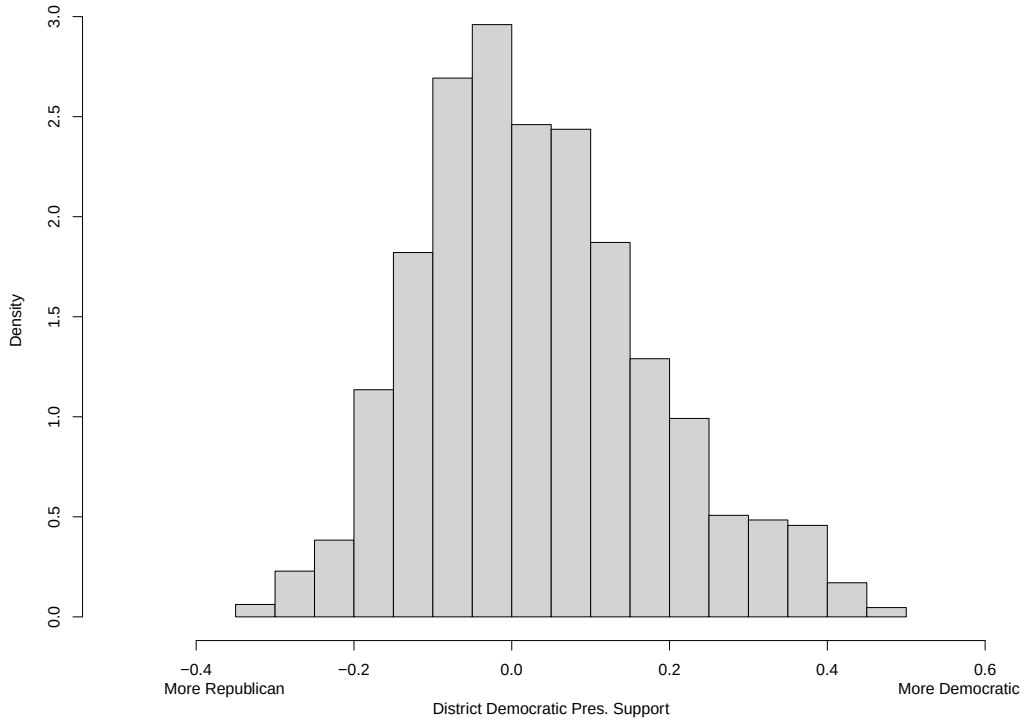


Figure A2: Density of Proportion of Committee Controlled by Majority Party Used in Analysis

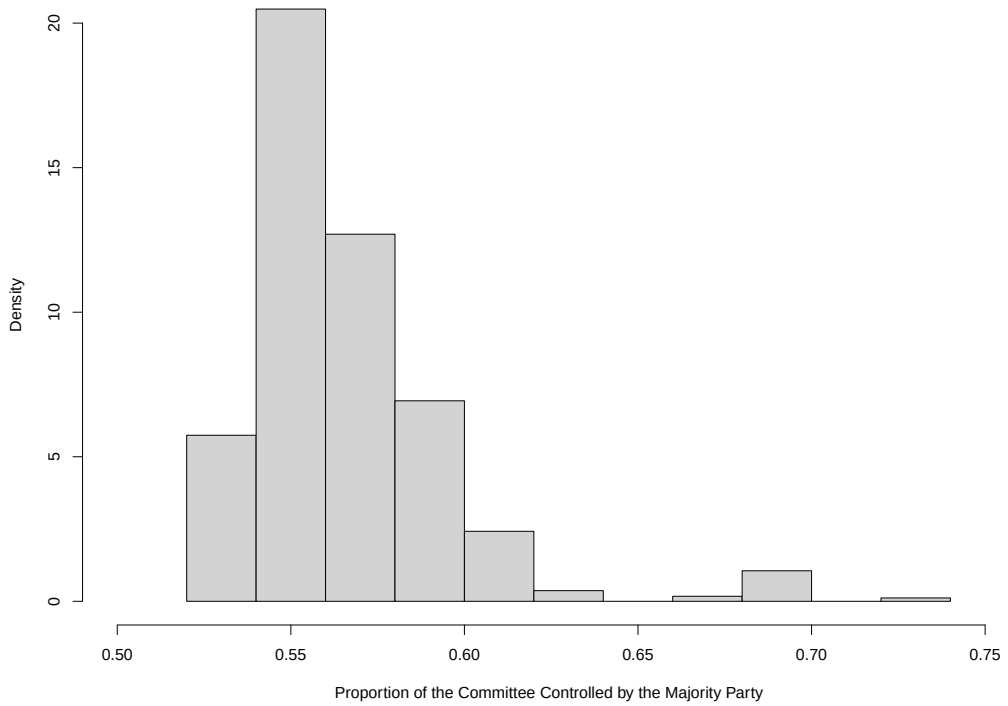
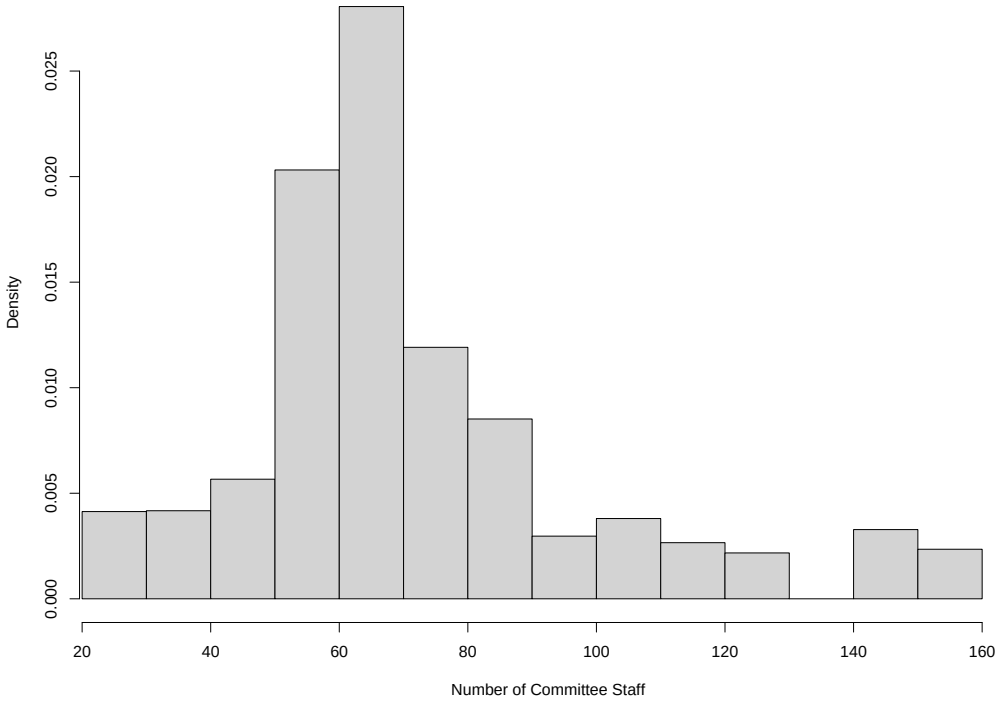


Figure A3: Density of Committee Staff Used in Analysis



Appendix B: Party Unity Results

The first three models in Table B1 leverage within district changes over time to predict party unity, and also include committee and congress fixed effects (model 1) and committee-by-congress fixed effects (model 2). Model 3 estimates first-difference changes within district. The independent variables are the absolute district partisanship as measured by the district's difference from the Democratic presidential vote share in the previous presidential election, where higher values indicate a more partisan district, and legislator party.

Table B1: Two-Way Fixed Effects Estimates for Party Unity, 104th-114th Congresses

	District F. E.			**Member F. E.**		
	(1)	(2)	(3)	(4)	(5)	(6)
Absolute District Partisanship	7.11*	7.62*	8.03*	1.46	1.46	9.20*
	(2.20)	(2.32)	(3.48)	(2.43)	(2.63)	(4.26)
Legislator Party (GOP=1)	1.98*	2.05*	1.91*	89.40*	90.88*	
	(0.627)	(0.632)	(0.966)	(0.444)	(1.50)	
Unit Fixed Effects	Yes	Yes		Yes	Yes	
Committee Fixed Effects	Yes		Yes	Yes		
Congress Fixed Effects	Yes		Yes	Yes		
Committee-by-Congress Fixed Effects		Yes			Yes	
First Differences			Yes			Yes
No. of Unit Fixed Effects	983	983		1,001	1,001	
R-Squared	0.017	0.025	0.005	0.001	0.001	0.032
N	5,162	5,162	3,332	5,162	5,162	3,002

Note: *p<.05. Models are panel linear regression where the dependent variable is a district's (models 1-3) or legislator's (models 4-6) party unity score on committee *j* in Congress *k*. Cases indicate number of district or legislator fixed effects. Standard errors clustered by unit (number of clusters equals number of unit fixed effects, in model 3 number of clusters is 790 and in model 6 number of clusters is 794). In model 6 legislator party cannot be estimated because it does not change within legislator across time.

In each of the first three models, as a district becomes more partisan, the party unity score of the member from that district increases by about by .071% for each additional percentage more partisan the district is compared to the country. An increase from the minimum level of district partisanship to the mean produces an increase in party unity voting of about 3.33% (95% CI: 1.31% to 5.36%) (model 1). While not a huge substantive increase in party unity voting, it is equal to about .45 of a standard deviation. Party unity voting on committees is extremely high especially in recent congresses, and only 45 district-assignments out of 463 in the 114th Congress, had a party unity score 3.33 percentage points less than 100. The substantive effects are very similar in models 2 and 3, and combined, these

result demonstrate that more partisan districts produce greater party unity within committee voting.

Legislator party is also positive and statistically significant. Consistent with research on asymmetric polarization (Thomsen 2009), even when accounting for district partisanship, Republicans have a higher party unity score than Democrats. Republican party unity scores are about 1.98% higher than Democrats, or slightly less than half of the effect size as absolute district partisanship.

The results in models 4 and 5 of Table B1 show two-way fixed effects estimates leveraging variation within members rather than within districts. There are no significant results for either district partisanship or party, indicating that party unity voting in committees is responsive to district characteristics, but due to replacement of members rather than changes in behavior. The estimate for the differenced value is significant at the .05 level, and in the expected direction. This is the only significant estimate from the legislator-assignment identified models, however. These results are consistent with those for OC z-scores.

Appendix C: Coefficients for Committee Heterogeneity Interaction Models

Table C1 shows the coefficients for the substantive results plotted in Figure 5. The marginal effects in the left panel use the results from model 1, and are calculated by varying percentage of the committee controlled by the majority party, holding committee staff (logged) at its maximum. The marginal effects of district Democratic support in the right panel also use model 1 and are calculated by varying committee staff, holding percentage of the committee controlled by the majority party at its maximum. Figure 6 plots the substantive effects of absolute district partisanship from model 2 by varying percentage of the committee controlled by the majority party, holding committee staff (logged) at its maximum.

Table C2 shows the coefficients for the substantive results plotted in Figure 7. The left panel shows the marginal effect of district Democratic presidential support varying incumbent vote share in the previous election while holding all other variables at their mean. The right panel does the same, but shows absolute district Democratic presidential vote.

Table C1: District-Assignment Two-Way Fixed Effects Estimates of the Conditional Effect of Partisan- and Information-Induced Preferences on Ideology, 104th-114th Congresses

	DV=Ideology	**DV=Absolute Ideology**
	(1)	(2)
District Dem. Presidential Support	34.07	
	(18.18)	
Absolute District Presidential Support		1.09
		(10.76)
Legislator Party (GOP=1)		-0.065*
		(0.024)
Percent of Committee Controlled by Majority	3.45	0.576
	(4.86)	(3.45)
Committee Staff (Logged)	0.395	0.245
	(0.741)	(0.471)
District Dem. Support x Percent of Comm. x Staff	17.16*	-0.946
	(7.94)	(4.58)
District Dem. Support x Percent of Comm.	-69.98*	0.453
	(32.10)	(18.73)
District Dem. Support x Staff	-9.21*	0.355
	(4.50)	(2.63)
Percent of Comm. x Staff	-0.885	-0.341
	(1.24)	(0.816)
District-Assignment Fixed Effects	Yes	Yes
Committee Fixed Effects	Yes	Yes
Congress Fixed Effects	Yes	Yes
No. of Unit Fixed Effects	980	980
R-Squared	0.315	0.046
N	5,154	5,154

Note: *p<.05. Models are panel linear regression where the dependent variable is a district's ideology z-score on committee *j* in Congress *k* (model 1), or a district's absolute ideological z-score (model 2). Standard errors clustered by district (number of clusters equals number of unit fixed effects).

Table 4: District-Assignment Two-Way Fixed Effects Estimates of the Conditional Effect of Partisan- and Information-Induced Preferences on Ideology, 104th-114th Congresses

	DV=Ideology	**DV=Absolute Ideology**
	(1)	(2)
District Dem. Presidential Support	34.07	
	(18.18)	
Absolute District Presidential Support		1.09
		(10.76)
Legislator Party (GOP=1)		-0.065*
		(0.024)
Percent of Committee Controlled by Majority	3.45	0.576
	(4.86)	(3.45)
Committee Staff (Logged)	0.395	0.245
	(0.741)	(0.471)
District Dem. Support x Percent of Comm. x Staff	17.16*	-0.946
	(7.94)	(4.58)
District Dem. Support x Percent of Comm.	-69.98*	0.453
	(32.10)	(18.73)
District Dem. Support x Staff	-9.21*	0.355
	(4.50)	(2.63)
Percent of Comm. x Staff	-0.885	-0.341
	(1.24)	(0.816)
District-Assignment Fixed Effects	Yes	Yes
Committee Fixed Effects	Yes	Yes
Congress Fixed Effects	Yes	Yes
No. of Unit Fixed Effects	980	980
R-Squared	0.315	0.046
N	5,154	5,154

Note: *p<.05. Models are panel linear regression where the dependent variable is a district's ideology z-score on committee *j* in Congress *k* (model 1), or a district's absolute ideological z-score (model 2). Number of unit fixed effects indicate number of observed districts. Standard errors clustered by district (number of clusters equals number of unit fixed effects).