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Research Note

Legislative Responsiveness to Gerrymandering: Evidence from the 2003 Texas Redistricting*

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ABSTRACT

Do legislators respond to congressional redistricting? A central tenet of American legislative scholarship over the last 20 years argues that members of Congress maintain consistent ideological positions throughout their tenure, and thus do not generally adapt their voting records to changes in the electoral environment. In contrast, a second literature argues that legislators are predominantly motivated by electoral incentives through an electoral connection, forcing them to adapt to the shifting environment as agents of the electorate. In this research note, I test these competing theories using data from the 2003 Texas redistricting. Despite being treated to a targeted gerrymander subjecting them to extreme electoral pressure, I find little evidence of ideological adaption in the voting records of eight Democrats that were targeted for defeat. My results thus confirm the earlier findings of Poole (2007) and have broader implications for the study of political representation and polarization.

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Do legislators respond to congressional redistricting? A central tenet of American legislative scholarship over the last 20 years argues that members of Congress maintain consistent ideological positions throughout their tenure, and thus do not generally adapt their voting records to changes in the electoral environment (Kalt and Zupan, 1984; Lott and Davis, 1992; Lott and Bronars, 1993; Poole, 2007). In particular, this literature finds that legislators maintain a consistent ideological position even as their district boundaries change (Poole and Romer, 1993), and casts doubt on the claim that gerrymandering is a significant cause of the increasing levels of partisan conflict and polarization in Congress (McCarty *et al.*, 2009). These findings of ideological stability are complemented by Levitt (1996), who shows that senators overwhelmingly rely on their fixed personal ideologies, rather than party pressure or changing constituent preferences, when casting votes.

In stark contrast to the literature emphasizing the ideological stability of legislators, a second literature argues that legislators are predominantly motivated by electoral incentives (Mayhew, 1974). In doing so, legislators seeking reelection are bound to their districts by an electoral connection that compels them to adapt to the shifting electoral environment. These adaptions can be observed from the voting record of incumbent legislators — using similar research designs with various measures of voting behavior (i.e., Conservative Coalition voting, ADA and DW-NOMINATE scores), numerous scholars (i.e., Glazer and Robbins, 1985; Stratmann, 2000; Leveaux-Sharpe, 2001; Carson *et al.*, 2007; Bertelli and Carson, 2011) find evidence that changes to the boundaries of a congressional district can impact post-redistricting legislative behavior in predictable ways. These findings are buttressed by a literature in economics that views legislators as agents of voters and investigates the extent to which legislators shirk from the preferences of those they represent. Members thus appear responsive to changes in their district and do not necessarily maintain consistent ideological positions over their tenure.

However, studies of redistricting are complicated by numerous threats to validity. In virtually all redistricting studies, changes in district boundaries are accompanied by a host of other changes to the legislative environment, including shifts in chamber membership, committee rosters, partisan control of the legislature, and the chamber's policy agenda. It is thus difficult to isolate the effect of changes in the electoral environment on legislative voting behavior. Rather, a more favorable empirical situation would be one where several legislators are simultaneously treated with redistricting that

unambiguously threatens their plans for reelection while holding the legislative environment constant. Such an experiment would have sufficient power to both detect and rule out the possibility of significant change, while simultaneously ruling out changes in the legislative environment as a threat to validity.

In this research note, I exploit a rare natural experiment that contains these characteristics — the Texas redistricting of 2003. After winning control of the state legislature in 2002, Texas Republicans under House Majority Leader Tom DeLay engineered a controversial mid-decade redistricting designed to establish a Republican majority in the House of Representatives. The redistricting effort specifically targeted the defeat of eight Democratic legislators, and contributed to the Republicans winning 21 of Texas' 32 seats in the subsequent 2004 congressional election. Following the logic of the electoral connection, one would expect that legislators threatened by redistricting would moderate their voting behavior to more closely align their voting records with the mean preferences of their constituencies. Instead, I demonstrate that despite facing a greater electoral threat in their new districts, the eight targeted Texas Democrats did not moderate their voting records following passage of the redistricting plan. By taking advantage of this natural experiment, my results support Poole's claim that "based upon the roll call voting record, once elected to Congress, members adopt an ideological position and maintain that position throughout their careers." (Poole, 2007, p. 3).

1 Background of the 2003 Texas Redistricting

Similar to most other states, redistricting in Texas has traditionally been conducted every 10 years after the national Census. Following the 2000 census, Republicans controlled both the state senate and the governorship, and the state had been carried by Republicans in every presidential election since 1984. Yet Democrats still controlled the Texas state legislature and held a 17–13 edge in House seats representing Texas. Under this political backdrop, Democratic and Republican lawmakers were unable to agree on a new district map based on the latest census data. With the legislature split between the two parties, no redistricting plan was passed in 2001, and the matter was submitted to a panel of judges following state law. This led the U.S. District Court for the Eastern District of Texas to impose the final map (Plan 1151C)

for the 2002 elections in *Balderas v Texas*, which largely protected both parties' incumbents while adding two new seats through reapportionment that favored the GOP. The minimal changes to the congressional map resulted in a 17–15 edge in House seats for the Democrats after the 2002 elections, while also electing a Republican majority to the state House of Representatives for the first time in 130 years.

With control of both state chambers, Republican lawmakers under Tom DeLay attempted to pass a new congressional map in the spring of 2003 that would give the GOP an electoral advantage, and scheduled a vote on the redistricting legislation for May 12. The legislation was particularly controversial as Texas had never before undertaken a mid-decade redistricting that was not ordered by a court. Armed with the knowledge that they would almost certainly lose, 52 House Democrats fled to Oklahoma the night before the vote, denying the House a quorum and effectively ending the redistricting debate for the remainder of the regular legislative session. Undeterred by their actions, Republican Governor Rick Perry responded by calling three 30-day special legislative sessions to pass a new map, leading 11 Democratic senators to also flee for New Mexico to prevent a senate quorum. Democratic state senator John Whitmire ultimately relented and ended the stalemate by returning to his district, leading the Texas legislature to ultimately pass redistricting Plan 1374C on October 12, 2003. Opponents filed numerous lawsuits to overturn the plan, but the U.S. District Court for the Eastern District of Texas ruled against all objections in January 2004, upholding Plan 1374C for the 2004 elections.

The Republican strategy under Plan 1374C was designed to fragment districts represented by eight Anglo Democrats (McKee and Shaw, 2005).[1] In doing so, they hoped to erode the incumbency advantage of the eight Democrats by placing them in areas they had not represented before, while dividing their former districts amongst heavily Republican districts and

[1] Although there were 10 Anglo Democrats, two were not seriously threatened by redistricting. Bill Hall (TX-4) was a conservative Democrat long rumored as a candidate to switch parties, and he changed his party affiliation to Republican in early 2004. Bickerstaff (2007, p. 99) writes that "Republican redistricting plans in 2003 did not target Hall for defeat by a Republican. In fact, Republicans usually counted him as an add-on to any Republican successes through redistricting." Gene Green (TX-29) retained 80.6% of his majority Hispanic constituency and ran unopposed by Republicans in 2004, and was thus also not under serious electoral threat (McKee and Shaw, 2005).

pitting them against strong Republican incumbents.[2] Subsequent academic accounts also suggest that the implemented redistricting plan showed a pro-Republican bias (McKee *et al.*, 2006) and contributed to Republicans winning 21 of the 32 Texas House seats in the subsequent 2004 election. In the next section of the paper, I discuss the electoral impact of the 2003 redistricting for each of the eight Anglo Democrats, all of whom faced significantly greater electoral threat under the new map.

1.1 Legislators Targeted for Defeat

The 2003 redistricting specifically targeted eight Democrats for defeat. In this section, I discuss the circumstances facing each legislator, how they responded to the new map, and subsequent outcomes in the 2004 election that followed.[3]

1. Max Sandlin (TX-1) resided in a district where Republican vote in 2002 was 57.9%.[4] The redistricting plan left him with only 40% of his prior constituents and he lost to Republican Louis Gohmert in 2004 by a margin of 37.7%–61.5%.

2. Jim Turner (TX-2) resided in a district where Republican vote in 2002 was 56.4%. His place of residence was moved to District 6, which contained only 4.4% of the voters from his old district and paired him against incumbent Republican congressman Joe Barton. The remainder of his district was divided among four other districts. Faced with bleak electoral prospects, Turner did not seek reelection in 2004.

3. Nick Lampson (TX-9) resided in a district where Republican vote in 2002 was 52.2%. His district was split among three neighboring Republican districts, and his home county in Beaumont was transferred into District 9, which included several strongly conservative suburbs near Houston. He ran and lost against Republican Ted Poe in the second District in 2004 by a margin of 42.9%–55.5%.

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[2] The electoral benefit of incumbency can be quite significant. Ansolabehere *et al.* (2000) estimate that the incumbency advantage averaged about 8–9% in the most recent decades, with 4% of that comprised of benefits from the personal vote.

[3] Most of the information from this section is drawn from Bickerstaff (2007), who provides a detailed account of the controversy surrounding the 2003 Texas redistricting and its aftermath.

[4] In this section, Republican vote refers to the weighted average of all statewide elections in 2002, including those for governor, lieutenant governor, and comptroller.

4. Lloyd Doggett (TX-10) resided in a district where Republican vote in 2002 was 40%. The district is home to Austin (Travis County), which traditionally votes much more liberal than the rest of Texas. The 2003 redistricting split Travis country into three congressional districts, two of which were heavily Republican. The third district (District 25) created a Hispanic-majority district in which Doggett was thought to be vulnerable to a Hispanic challenger. Doggett ultimately won reelection in 2004.

5. Chet Edwards (TX-11) resided in a district where Republican vote in 2002 was 62.8%. His residence was transferred to a new district (District 17) with only 35.2% of his previous constituents. Despite expectations that he would lose to Republican state lawmaker Arlene Wohlgemuth, he narrowly won reelection in his new district in 2004 by a margin of 51.2%–47.41%.

6. Charles Stenholm (TX-17) resided in a district where Republican vote in 2002 was 67.2%. His home county was moved to the heavily Republican District 19, which included only 30.9% of his previous constituents. Paired against Republican incumbent Randy Neugebauer in the new district, he lost his bid for reelection in a district where Neugebauer retained 58% of his old constituents, by a margin of 40.0%–58.4%.

7. Martin Frost (TX-24) resided in a district where Republican vote in 2002 was 42%. The county was mostly split across four heavily Republican districts, all with Republican incumbents. Frost subsequently decided to run in the 32nd district and lost to Republican incumbent Pete Sessions, in a district where Sessions retained 52% of his old constituents while Frost retained only 20%. He lost by a margin of 44.0%–54.3%.

8. Chris Bell (TX-25) resided in a district where Republican vote in 2002 was 48.5%. His home county was moved into heavily Republican District 7, home of Republican incumbent John Culberson. The remainder of his district was mostly shifted into District 9, which retained 46.5% of his previous constituents. He was subsequently defeated in the Democratic primary in 2004.

In summary, all evidence suggests that the eight legislators described here were subject to significantly greater electoral threat under the new map, and their voting records are thus ideal for testing competing hypotheses about legislative responsiveness to redistricting. Furthermore, all but one legislator (Turner) sought reelection, thus ruling out the possibility that any detectable shifts are attributable to shirking (Rothenberg and Sanders, 2000). If legislators are responsive to district boundaries as Glazer and Robbins (1985),

Stratmann (2000), and Bertelli and Carson (2011) have argued, one would expect significant moderation in the voting records of these eight legislators following redistricting. If instead, ''members of Congress die in their ideological boots'' as Poole (2007) has argued, responsiveness should be minimal and voting moderation would be unlikely to occur.

2 Redistricting as a Natural Experiment

2.1 Why Examine Texas?

My primary strategy for testing legislative responsiveness to redistricting is to treat the 2003 gerrymander as a natural experiment on the 31 Texas legislators whose district boundaries were changed.[5] Using voting records from the 108th Congress, which spans 2003–2004, I estimate the ideological locations of the legislators using Poole and Rosenthal's W-NOMINATE procedure (Poole and Rosenthal, 1985; Poole *et al.*, 2011). Comparing the voting records of the eight targeted Democrats before and after redistricting helps determine the extent to which legislators respond to shifts in district boundaries. To do so, I employ a roll call discontinuity design similar to those described in Poole (2005), Kousser *et al.* (2007), and Ho and Quinn (2010).

For the purpose of examining the effect of redistricting on legislative voting, the Texas redistricting is an excellent natural experiment for three reasons. First, because the redistricting occurred in the middle of the 108th Congress, comparisons of legislative voting records before and after redistricting hold the legislative context of the two periods constant. Since the Texas redistricting occurred independent of any legislative contests, it has unique features that allow the effect of its signal to be isolated. In particular, while some (i.e., Glazer and Robbins, 1985) have explicitly claimed that the decennial redistricting is a natural experiment, such studies typically compare legislators across two or more different Congresses.[6] In doing so, they compare treatment and control groups that are not directly comparable because the institutional context facing the two groups

[5] Although he was not threatened by the redistricting, Bill Hall switched his party affiliation from Democrat to Republican around the same time period that redistricting took place. I thus exclude him from this analysis.

[6] For example, the main analysis in Glazer and Robbins (1985) examines the conservative coalition scores of congressmen elected before 1980 and still in office after the 1982 redistricting. Yet the 1982 House was substantially changed from the 1980 House, with Democrats picking up 27 seats in the 1982 midterm election.

of legislators — chamber membership, committee rosters, and the chamber's policy agenda, among others — may differ substantially.

The need to hold the legislative context of the two periods constant is especially important in light of the debate surrounding Rothenberg and Sanders (2000), who argue that members of the U.S. House of Representatives shirk (i.e. change their roll call voting patterns) when they anticipate retirement in the near future. Rothenberg and Sanders also employ a quasi-experimental research design, comparing W-NOMINATE scores estimated across different Congresses for legislators seeking reelection to those departing the House during the 102–104th Congresses. Their findings have been challenged by Carson *et al.* (2004), who argue that the results are not robust to the inclusion of Congress-specific fixed effects, and by Herron (2004), who argues that legislator ideal points that are estimated separately cannot necessarily be compared to one another. At the heart of both critiques lies the argument that legislative context affects estimates in ways that require some additional correction, such as the inclusion of fixed effect terms. An important feature of my research design is that by considering a redistricting that occurs mid-Congress, I can draw inference about changes in legislative voting without the need for such corrections.

Secondly, the Texas redistricting is also a useful case because it contains sufficient data to power the study. The 108th Congress contains a total of $N = 1218$ votes, including 460 votes before redistricting and 758 votes after redistricting. Across these periods, the treatment group consists of 31 Texas legislators whose districts were simultaneously exposed to the redistricting treatment, including eight Democratic legislators specifically targeted for defeat. Collectively, the size of this data facilitates estimation of the Texas redistricting effect with moderate levels of precision.

Finally, the Texas redistricting is an ideal case because its treatment is both specifically targeted and highly concentrated. One difficulty in linking redistricting to legislative behavior lies in the measurement of the extent of district change. In particular, it is possible that redistricting is only likely to affect voting if the change in district boundaries is major, though what constitutes major redistricting is not altogether clear. Stratmann (2000) and Carson *et al.* (2007), for example, have both defined *significant change* as a redistricting that causes greater than 50% change in geographic constituency — an approach criticized by Bertelli and Carson (2011) for being too blunt. In contrast, the Texas redistricting was widely known to target the reelection campaigns of eight specific Democratic legislators, and trans-

formed district boundaries for those legislators in unambiguously important ways.[7]

2.2 Estimation and Results

Conducting a test of legislative responsiveness to redistricting using roll call data requires estimates of the voting records of the eight threatened legislators both before and after redistricting in a common ideological space. Note that one cannot simply apply W-NOMINATE separately to all votes before and after the gerrymander; this is because the underlying ideological dimensions recovered by W-NOMINATE for two separate sets of roll call votes are not directly comparable. Instead, I assume that legislators outside Texas, whose district boundaries were unaltered by the the gerrymander, are unaffected and do not change their voting behavior throughout the entire 108th Congress. I then treat each Texas legislator's voting record in each of the two separate periods as a separate legislator, allowing them to vary freely between the two periods. In doing so, I estimate a single W-NOMINATE model in one dimension in which all legislators from Texas are allowed to shift positions, along with legislators elsewhere in the U.S. that are constrained to have the same ideal point across the entire 108th Congress.[8] These constrained legislators facilitate meaningful comparisons of the ideal points of the threatened members across both periods by holding the scale and rotation of the ideological space constant over time.[9]

Figure 1 shows a plot of the estimated W-NOMINATE scores for all Texas legislators. Circles represent point estimates before redistricting and squares represent estimates after redistricting, with the eight targeted Democrats

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[7] To illustrate this point more forcefully, Bertelli and Carson's (2011) study of redistricting used a data set in which their measure of redistricting magnitude, percent new voters, had a mean of 10.9% with a standard deviation of 16.5%. This pales in comparison to the magnitude of changes in Texas described earlier — Turner, for example, only retained 4.4% of his former constituents in his new district.

[8] Results from this model are strongly one-dimensional, with an Aggregate Proportional Reduction in Error (APRE) of 0.776%, 92.1% of votes correctly classified, and an overall Geometric Mean Probability (GMP) of 0.818.

[9] Comparisons of ideal points across time all require some assumption that bridges the ideological space between periods to facilitate inter-temporal comparisons — no ideal point estimators permit all legislators to shift positions simultaneously over time without addressing the issue that such estimates are only relatively identified to one another. The decision to hold the ideal points of non-threatened Congressmen fixed represents the most natural way to fix the ideological space across the two periods because this is in fact the implicit assumption that is made when running W-NOMINATE on all legislators across a full Congress.

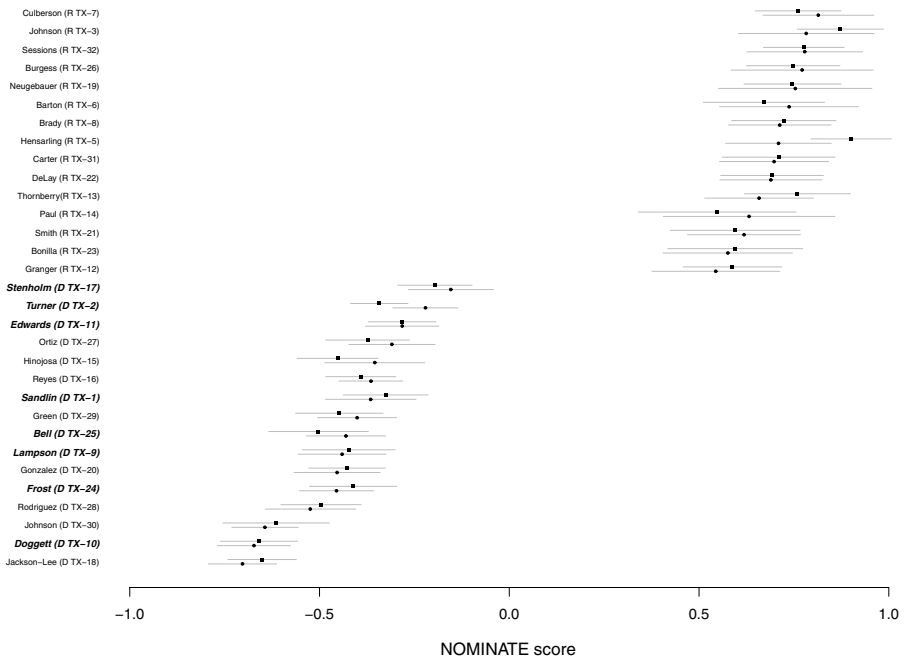

Figure 1. Estimated ideal points of texas legislators, 108th House: circles represent point estimates before redistricting, while squares represent estimates after redistricting. Bars represent 95% confidence intervals. Highlighted legislators are the eight Democratic legislators targeted in the 2003 redistricting.

highlighted in bold text. Using the parametric bootstrap (Poole and Lewis, 2004), I also estimate 95% confidence intervals for each legislator that are represented by the lines. W-NOMINATE estimates for the eight Democrats span much of the ideological range of the Democratic caucus, including liberals such as Doggett (−0.673) and conservative Democrats such as Stenholm (−0.154).[10] Individually, none of the estimated shifts in W-NOMINATE across the two periods for the eight targeted legislators are statistically significant. This is not surprising not only because the point estimates of the shifts are relatively small, but also because there is significant uncertainty associated with the estimated positions of individual legislators.[11]

[10] W-NOMINATE scores range from [−1, 1].

[11] For all Texas legislators, the largest and only statistically significant positional shift is Hensarling (R TX-5), who shifts 0.191 to the right ($t = 2.14$). However, with 31 possible comparisons,

Averaged across the eight targeted legislators, the estimated mean effect of the 2003 redistricting is -0.015.[12] Note that the estimated mean effect is wrong-signed, in the sense that one would expect the threatened Democrats to moderate rather than move further to the left. Moreover, the shifts for the targeted Democrats are not atypical of those estimated for other Texas legislators that were not threatened by the redistricting. Estimates from the same model suggest that Texas Democrats not targeted by redistricting shifted by -0.013 ($N = 8$), while Texas Republicans shifted by $+0.014$ ($N = 15$) — estimates that are similar in magnitude to those of the targeted Democrats.[13] Visual inspection of the individual ideal point estimates suggest that none of these estimates are sensitive to outliers.

Two resampling tests are available to help determine the statistical significance of this estimated shift. First, I simulate a sampling distribution of the expected shifts for the control units under no treatment condition. Since legislators other than the eight targeted Democrats are not threatened by the redistricting, they constitute a placebo population. To simulate the expected shifts among the control units under no treatment condition, I generate 1000 roll call data sets where 31 random placebo legislators are selected. These placebo legislators are permitted to shift their ideal points in an identical manner to the original treatment units, varying before and after the 2003 Texas redistricting. In each of the 1000 roll call data sets, I then randomly select 8 of the 31 placebo legislators to represent the eight threatened legislators, and estimate the mean effect of the 2003 redistricting for each sample under the null. This produces the sampling distribution plotted on the top panel of Figure 2. The estimated shift lies well within 95% of the sampling distribution, and is therefore not statistically significant. The simulated sampling distribution also implies that the standard error of the estimate is $\hat{\sigma} = 0.021$.

I validate these results further by simulating the shifts that one would estimate among the treatment units under no treatment condition. Rather than randomizing the selection of placebo legislators, I instead fully randomize the order of all votes in time across 1000 pseudo-data samples, and pro-

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at the $\alpha = 0.05$ level of significance it is expected that at least one of the estimated shifts will be statistically significant by chance.

[12] If one assumes that the voting records of Texas legislators who were redistricted, but not threatened, were unchanged after redistricting, an alternative estimation procedure would be to only allow the eight targeted Democrats to shift. This model estimates a mean W-NOMINATE shift of -0.014, which is almost identical to what is estimated by the main model.

[13] These shifts also appear to be statistically insignificant, a point demonstrated later in Table 1.

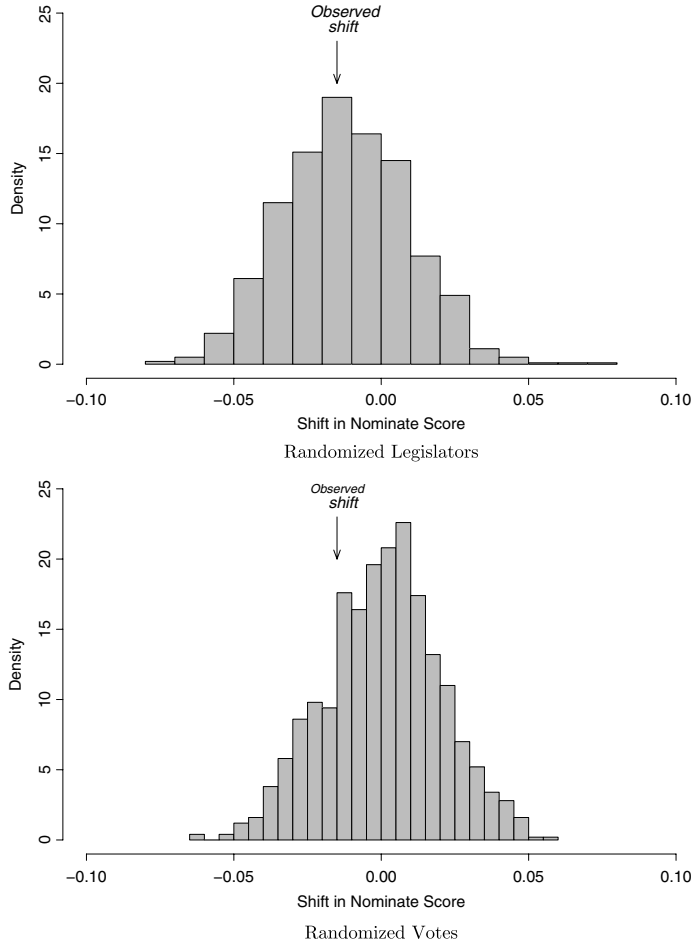

Figure 2. Sampling distribution under the null.

ceed by estimating pre/post ideal points for all Texas legislators as before. Each pseudo-treatment period in this simulation contains the same number of roll call votes as in the original data set; however, each period will now instead contain roughly equal proportions of votes from before and after the redistricting treatment. Since this procedure effectively randomizes the roll call votes in the control and treatment periods across the pseudo-control and pseudo-treatment groups in each data set, the simulated mean shifts for the eight targeted legislators across the 1000 simulations will also produce a null sampling distribution. The result from this test, plotted on the bottom

panel of Figure 2, confirms the statistical insignificance of the estimate and implies a standard error of the estimate of $\hat{\sigma} = 0.020$ — essentially identical to what was estimated previously using the placebo legislator resampling procedure.

The estimated mean shift is not only statistically insignificant, but also substantively insignificant as well. To place into perspective how small a -0.015 shift is, note that the standard deviation of W-NOMINATE for the entire 108th Democratic caucus is 0.183 — more than 12 times the magnitude of the estimated shift.[14] The estimate of this shift is relatively precise, with a 95% confidence interval of $[-0.054, 0.023]$, so even the extreme boundaries of the estimated shift are trivially small. Moreover, the effect is negligible relative to estimates found elsewhere in the literature. Bertelli and Carson (2011), for example, estimate that the effect of 1% new voters in a district is a 0.006 shift in DW-NOMINATE, which is a similar (though not directly comparable) measure to what is used here. For Chet Edwards, the Bertelli and Carson model predicts a 0.389 shift in DW-NOMINATE following redistricting — an estimate many times larger than anything implied by my results. Yet Edwards was successful in his reelection bid in 2004 despite showing no evidence of a voting shift of this magnitude.

As an additional robustness check, I estimate three additional models similar to the main model described here. Boatright (2004) has argued that legislative anticipation of congressional redistricting significantly complicates attempts to detect changes in legislative behavior. I consider this possibility by estimating a second model that uses the date that the 2003 redistricting legislation was introduced in the Texas state legislature, rather than the date the legislation was passed, as the date of treatment. This model produces an estimated mean treatment effect of -0.045. Following a similar logic, I also consider the possibility that uncertainty surrounding the legal challenges posed to the redistricting effort may systematically bias my estimates. To that end, I estimate a second model, using the date the U.S. District Court for the Eastern District of Texas ruled against all objections in January 2004 as the date of treatment. This model produces an estimated mean treatment effect of 0.013. These results, along with standard errors generated separately using the vote randomization procedure described earlier,

[14] The standard deviation of the full 108th House is 0.595, which only further demonstrates the relatively negligible size of the shift.

Table 1. Estimates mean W-NOMINATE shifts for eight targeted Democrats.

Main result (Treatment begins after legislation passed)	−0.015
	(0.020)
Treatment begins after legislation introduced	−0.045
	(0.029)
Treatment begins after legislation survives legal challenges	0.013
	(0.019)
Non-threatened Texas Democrats ($N = 8$)	−0.013
	(0.021)
Non-threatened Texas Republicans ($N = 15$)	0.014
	(0.018)

Note: Standard errors in parentheses are estimated using the vote resampling procedure described earlier. In all cases, the estimated voting shifts are substantively small and statistically insignificant.

are summarized in Table 1.[15] In short, none of my estimates are consistent with the expectation that the targeted Democrats moderated their voting to any significant extent following the 2003 redistricting.

Finally, I also consider the possibility that a shift in the voting records of the targeted Democrats may have occurred *after* the 2004 election. This analysis is necessarily limited because only two legislators (Doggett and Edwards) survived their reelection campaigns for the 109th Congress, thus reducing the sample size considerably. Furthermore, this analysis also cannot hold the legislative context of the pre/post periods constant, a key feature of the main research design. Nevertheless, to examine this possibility I pool roll call votes from the 108th and 109th Congresses together, estimating one ideal point for each member serving in both to fix the ideological space across the two Congresses. In the same model, I also estimate ideal points for Doggett and Edwards that are permitted to shift between Congresses. This

[15] Note that the standard errors in the different models can change because the distribution of votes in the pre/post redistricting periods are also changing. For example, the main model in which treatment is assumed to begin after redistricting legislation is passed includes 460 of 1218 votes in the pre-treatment period. In contrast, the model in which treatment is assumed to begin after redistricting is introduced includes only 181 of the same 1218 votes in the pre-treatment period.

model produced an estimated mean shift of 0.032 for the two legislators — a very small level of moderation that is consistent with the substantively null results estimated earlier.[16] Using the same placebo resampling test as before with an N of two, the estimated standard error of this estimate is $\hat{\sigma} = 0.050$. Thus, the voting records for Doggett and Edwards do not appear to moderate in either statistically or substantively important ways following their successful reelection campaigns.

3 Conclusion and Discussion

Scholars have long debated the extent to which legislators vote in ways that are responsive to their constituents. Previous studies on this issue have yielded mixed results, in part because changes to district boundaries are usually accompanied by a series of institutional shifts that make isolation of the signal difficult. In this research note, I address this issue by exploiting a rare natural experiment — the 2003 Texas redistricting. The new boundaries introduced by the plan placed extreme electoral pressure on eight incumbent Democratic legislators, and thus constitute an ideal test of these competing hypotheses. Despite the extreme nature of the treatment, my results confirm the findings of Poole (2007) that legislators largely vote in ideologically consistent ways once elected to Congress.

My work also speaks to the literature examining the impact of gerrymandering on polarization. If gerrymandering causes polarization by making members of the House safe from interparty challenges and allowing them to play closer attention to their primary constituency (Balz, 2005; Nagourney, 2005), then it follows that gerrymanders designed to instead make members more vulnerable to interparty challenges should instead cause them to moderate. Yet my results here are largely inconsistent with these expectations. My results thus also reaffirm the findings of McCarty *et al.* (2009), who find that gerrymandering cannot explain the political polarization that characterizes recent Congresses to any significant extent.

Nevertheless, interpretation of the results presented here requires caution. While my results suggest a lack of responsiveness after getting elected, correspondence between legislators and districts can occur through other means,

[16] Doggett's ideal point shift from −0.587 to −0.547, while Edwards shifted from −0.190 to −0.166.

including elections. To be sure, districts can support a wide ideological range (Poole and Romer, 1993). Chet Edwards, for example, was able to win in a heavily Republican-favored district despite possessing the voting record of a moderate Democrat.[17] Furthermore, there is evidence that legislators may be *conditionally* responsive to constituents — Gerber and Lewis (2004), for example, find that legislators from more heterogeneous districts are more likely to deviate, in a polarized fashion, from the average preference of their constituents. With only eight legislators significantly treated by redistricting, this natural experiment lacks the data to investigate these possibilities further. Nevertheless, my work points to the need to theoretically clarify the sense in which legislators can be viewed as the agents of the electorate. How is this relationship enforced, and under what conditions do legislators deviate from the interests of their constituents?

My results also admit a possible complementary conclusion — that not changing voting positions after redistricting is a losing strategy. Of the eight targeted Democrats, one chose to retire (Turner), and only two (Doggett and Edwards) survived the next election. Although this interpretation of the Texas redistricting is possible, it is unlikely that even a significant voting shift would have saved the five Democrats who lost their bids for reelection. The five Democrats included one legislator (Bell) who was defeated in a primary, two (Sandlin and Stenholm) who were defeated by sizable margins in 2004, and two (Frost and Lampson) who were defeated by narrower margins (10 and 13 points, respectively). It is thus worth considering the counterfactual of what would have happened to Frost and Lampson if they had significantly changed their voting records after redistricting.

In a recent article on the electoral costs of party loyalty in Congress, Carson *et al.* (2010) find that a 50-point decrease in a member's party unity score increases incumbent vote share by nearly 5% in the subsequent election. Such a dramatic shift would have put both Frost and Lampson within striking distance of reelection, though it is likely that even this estimate represents an upper bound of the effect. First, a 50-point decrease is quite a dramatic and unlikely shift, effectively turning a perfectly loyal Democrat into one that is equally likely to side with either party on a party line vote. Furthermore, neither Frost nor Lampson were particularly loyal to their party even before redistricting — in the 107th Congress, their party loyalty

[17] The Cook Partisan Voting Index rates Edwards' new TX-17 district as R+20, making it the most heavily Republican district in the nation represented by a Democrat.

scores were 85.4% and 85.2%, respectively. A 50-point shift from that baseline would mean that they would be voting with Democrats on party-line votes only about 35% of the time. Finally, neither Frost or Lampson were true incumbents (in the sense that they retained only a fraction of their former constituents in their new districts), and they had less than a year to establish a relationship with their new constituents.[18] Thus, their ability to communicate their post-redistricting voting record to their new constituents would likely have been significantly hampered. In short, it is unlikely that even a significant shift in voting patterns for Frost and Lampson alone would have saved their bids for reelection.

Finally, my research highlights the methodological difficulties that many researchers have encountered in their attempts to better understand the nature of the electoral connection. In most cases, the data used to test various hypotheses involve comparisons of ideal point estimates for legislators that vary across time and institutions. While this body of work has contributed greatly to our collective understanding of legislative politics, it is significantly complicated by the fact that comparisons of legislators across Congresses are generally accompanied by a set of other institutional changes that make it difficult to isolate the effect of the phenomenon of interest. In this context, natural experiments that occur within a legislative period such as the 2003 Texas redistricting emerge as invaluable tools that complement other studies by targeting specific threats to validity that would otherwise be difficult or even impossible to control for.

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[18] Moreover, Frost's new district included a Republican incumbent, Pete Sessions, who retained a sizable fraction of his former constituents.

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