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Small changes, big results: Legislative voting behavior in the presence of new voters☆

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ABSTRACT

Changes in district boundaries in small magnitude electoral systems can have substantive consequences for representation. In the U.S., each decennial redistricting cycle infuses House districts with a large number of new voters, changing personal representation for many citizens. What effect does the influx of these new voters exert on member behavior? By assessing the extent of this change in constituencies in conjunction with member voting behavior on roll calls, we can determine if significant changes to a congressional district impact post-redistricting legislative behavior. Using panel data estimators and various measures of legislator behavior, we show evidence that supports this claim. Our findings have notable implications for debates over representation and electoral accountability in legislative assemblies.

> *Let me pull over to the curb and look at the map. I can't tell whether this area is in the district or not. It could be, but I'm not sure. That must have been some redistricting when the congressman who represents the district can't even tell whether he's in it or not. What a mess (quoted in Fenno, 1978, 6).*

In small magnitude electoral systems, district realignment is critical to the balance of winners and losers across parties, and gerrymandering takes a strategic and partisan flavor (e.g., Johnston et al., 1996; 1999; Taagepera and Shugart, 1989). Although many scholars accept the premise that legislators are bound by an "electoral connection" (Mayhew, 1974; Fenno, 1978; Bowler and Farrell, 1995; Canes-Wrone et al., 2002), others believe that legislators "die with their ideological boots on" (e.g., Poole and Rosenthal, 1997, 8) or maintain reputational capital (e.g., Richardson and Munger, 1990). The question of whether constituents exert an independent influence over legislative vote choice has been viewed as separate (cf. Fiorina, 1974; Arnold, 1990; Powell and Vanberg, 2000). We unite these lines of inquiry in this paper using a quasi-experiment provided by the 2000 redistricting cycle in the United States. Specifically, we address the following questions. Does constituency change have an impact on legislative outcomes or on the behavior of individual members, or both? What is the relative size of those impacts?

Using panel data estimators, we compare the impact of new voters (a) on floor voting and (b) on the vote behavior of individual legislators in the Congress following their entry into members' districts. Our results suggest that after the election, incumbent legislators needed to change their

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own voting behavior negligibly, while the aggregate effect in the legislature was of substantial benefit to the Republican Party. This partisan, ideological impact is rarely studied directly in the U.S. literature, but is central to the evaluation of the public policy impact of redistricting. The 2000 redistricting cycle occurred at a time when the partisan composition of state legislators and Congress was tilted in favor of Republicans. Specifically, then, our results show that floor voting moved in a substantially conservative direction, while any given legislator did not move very far in ideological terms.

We begin our exposition by reviewing the relevant literature on constituency effects in Congress and then illustrate how using redistricting helps further our understanding of constituency influence on legislative voting behavior. Our key variable of interest captures the legislator's rebalanced portfolio of constituents in the way we believe legislators think about it—a "new" constituency in addition to or, in some extreme cases, in lieu of an "old" constituency. We then test our expectations using data from the 2000 redistricting cycle in the U.S. House. A discussion section provides a closer substantive look at the 2000 scenario to further understand the impact that redistricting has on legislative voting behavior and suggests an explanation for the patterns we uncover that may yield fruitful future research. We discuss the implications of our findings for both theories of representation and for the study of legislative politics in the conclusion.

1. Using redistricting to assess constituency influence

Congressional redistricting in the U.S. provides a unique opportunity for examining a variety of questions in legislative politics (cf. Cain, 1985; Leveaux-Sharpe and Garand, 2001; Overby and Cosgrove, 1996). Most district boundaries are redrawn every ten years following each census to reflect population changes during the preceding decade. This has notable implications in that a redrawn district will include "old" constituents previously represented by a legislator and "new" constituents who had been represented by a different incumbent. To date, scholars have taken advantage of the quasi-experimental nature of district change to measure the personal vote as well as the incumbency advantage in Congress (see, e.g., Ansolabehere et al., 2000; Desposato and Petrocik, 2003; Friedman and Holden, 2009). We believe that redistricting can also offer valuable leverage on the question of stability in legislative voting even when constituents change if we can separate its influence on the behavior of individual members from its impact on floor voting.

One well-known aspect of partisan redistricting is incumbency protection. Cox and McCubbins (2005) claim that because the party's legislative record has an impact on the reelection prospects of its members, it amounts to a public good that its members have an incentive to collectively maintain. The party organization works to solve collective action problems among members in maintaining that record. Building on this argument, we claim that because incumbency protection implies that new voters introduced by redistricting will not drive individual members too far in ideological terms to protect their electoral prospects, the party as a whole can aggregate these small movements into more substantial policy gains in the legislative session following redistricting. This enhances the party's electoral record, producing further benefits to the members of the party that controls the redistricting decisions.

When congressional districts are redrawn following a decennial census, two distinct types of changes may affect legislative behavior based on the influx of new voters to a district. First, redistricting can change the ideological mix within the district, leading to alterations in legislator behavior. For instance, suppose that a district has previously been represented by a Democrat and the ideological mix of voters consists of 60% Democrats and 40% Republicans. If the congressional district is redrawn so that this mix is divided equally across both groups, then the legislator may feel pressure to moderate her behavior relative to other members of her political party to ensure that she continues to get reelected. Without ombudsman-like service to these new constituents and the positive reputation it engenders, the legislator does not necessarily have the leeway to vote in his or her prior pattern (cf. Fenno, 1978; Cain et al., 1987). Thus, the ideological composition of the district may have a direct effect on how legislators vote from one congress to the next.[1]

In addition to ideological change, new voters also can create uncertainty for an incumbent legislator. Critiquing and extending Wittman (1983), Calvert (1985) maintains that uncertainty about voter positions can have an impact on voting decisions. Specifically, in a two-candidate race when candidates are motivated by both policy and reelection, uncertainty over voter policy preferences can induce candidates to diverge from positioning themselves at the median voter's position on the policy space if candidates do not perceive the uncertainty in the same way. New voters can create this kind of uncertainty, which may increase with their number in a given district, and candidates may perceive new voters' preferences differently than their predecessors (see Grose and Yoshinaka, forthcoming). As Mayhew (1974, 67) asserts, "Probably the best position-taking strategy for most congressmen at most times is to be conservative—to cling to their own positions of the past where possible and to reach for new ones with great caution where necessary." If greater numbers of new voters provide more uncertainty about the policy preferences of the district, then a cautious strategy for legislators is to moderate their position (i.e., liberals more in a more conservative direction and conservatives move in a more liberal direction) until they have sufficient opportunity to develop legislative leeway through a personal vote (Fenno, 1978). If uncertainty can be managed through partisan redistricting, individual members need not modify their behavior in this way. They may lose aspects of their personal vote given the influx of new constituents, but the

[1] The nature of the ideological change can vary based on who is responsible for redrawing district boundaries at the state-level. For an extended discussion of these differential effects in conjunction with congressional redistricting, see Carson and Crespin (2004); Murphy and Yoshinaka (2009).

party label is valuable in securing the endorsement of these new voters.

Various scholars have argued with empirical support that redistricting as a mechanism has tended to protect incumbents from electoral pressure (see, e.g., Ansolabehere et al., 2000; Boatright, 2004; Cain, 1985; Jacobson, 2009; Murphy and Yoshinaka, 2009; Stratmann, 2000). More specifically, partisan redistricting plans tend to protect incumbents of the same party while bipartisan plans tend to protect incumbents irrespective of partisan affiliation. During the 2000 redistricting cycle, a majority of redistricting plans were created by states with Republican dominated majorities (Tarr, 2003). As such, we would expect Republican mapmakers to draw districts as favorable to their partisans in Congress as possible because of the impact these members will have on public policy; namely, it should be moved in a more conservative direction. By measuring new voters in each legislator's district in conjunction with their voting behavior on roll calls in the House, we can address these questions.

Although Poole and Rosenthal (1997) maintain that incumbents do not alter their voting behavior over their legislative careers, even in light of congressional redistricting, others have found evidence of member responsiveness to district change stemming from redistricting.[2] Logically prior to the modification of legislative behavior is the *influence* of constituency change on post-redistricting behavior, our focus in this and in various prior studies. Glazer and Robbins (1985), for instance, examine the 1980–82 redistricting cycle and find that legislators are indeed responsive to district changes. By comparing changes in conservative coalition scores pre- and post-redistricting, they show that politicians adapt their voting behavior in response to changes in their district.[3] In a recent analysis, Boatright (2004) examines the 1992 redistricting cycle and concludes that one of the reasons behind the difficulty in uncovering changes in legislative behavior in the past is members' *anticipation* of congressional redistricting. Thus, he maintains that it is equally important to focus on the pre-redistricting activities of legislators when evaluating representative behavior.

In a related analysis of legislative voting behavior, Stratmann (2000) examines whether representatives alter their behavior in response to a number of changes over the course of their career. Measuring redistricting as a greater than 50 percent change in geographic constituency, he evaluates changes in legislative behavior during the 1982 and 1992 redistricting cycles by examining changes in ADA ratings before and after redistricting of members who served in the pre- and post-redistricting congresses. As expected, he finds that legislators are responsive to constituency changes stemming from redistricting. In particular, he finds that members of the House become more conservative in roll-call voting as the district they represent becomes more conservative. Thus, he concludes that a representative's constituency exerts a considerable amount of influence over a legislator's voting behavior in Congress (in addition to a variety of other factors).

While Stratmann's findings are instructive for our case, we have reason to suspect that the crudeness of his redistricting measure may miss an important part of the underlying story. Our approach in this paper builds upon and offers three main improvements on the statistical model utilized by Stratmann (2000). First, we employ a much more nuanced and continuous measure of district change, which gives us the chance to more systematically investigate the effects of marginal geographic changes on post-redistricting behavior. Second, we examine influences in legislative behavior resulting from the most recent round of redistricting (2000–02), which have received only limited attention to date in the literature on congressional politics (but see Crespin, 2010). This is a fairly rigorous test of our behavioral change hypothesis since many of the districts in the most recent redistricting cycle only experienced changes at the margins. Finally, we employ statistical models that take advantage of both cross-sectional and time-series characteristics of our dataset to evaluate the impact of new voters on floor behavior.

2. Data and methods

To measure the directional change in members' voting records pre- and post-redistricting, we follow Stratmann (2000) by using the Americans for Democratic Action legislator rating (ADA score) for the 108th Congress and the 107th Congress as a measure of members' revealed ideology in floor voting. Annual ADA scores range from 0 (conservative) to 100 (liberal), and a positive (negative) change in scores corresponds with a legislator's movement in a more liberal (conservative) direction following the redistricting. Our dependent variable records the average of ADA ratings in 2001–2002 to measure ideology in the 107th Congress and similarly the average of ADA ratings in 2003–2004 for the 108th Congress. This will be the dependent variable in our preferred specification.

Because we are aware of the limitations of ADA scores as a measure of ideology (e.g., Fowler, 1982; Herron, 2001), we employ two alternate measures of ideology for robustness.[4] First, Groseclose et al. (1999, 33) note that the comparability of ADA scores across time poses problems due to issue and membership changes, and produce a set of "adjusted"

[2] While Ansolabehere et al. (2001: 140) agree with Poole and Rosenthal's (1997) assertion regarding stable legislative voting, they do speculate that one exception to this rule may be the ideological adjustments made necessary by an influx of new voters stemming from congressional redistricting.

[3] Leveaux-Sharpe (2001) extends Glazer and Robbins' (1985) data into the 1990s and finds that the higher than average turnover rate among members during this decade was *not* a function of lack of responsiveness to constituents after the decennial redistricting cycle.

[4] As one would anticipate from the fact that all are roll-call based measures, the correlation among these measures is very high. Larger ADA and adjusted ADA scores suggest more liberal legislators while larger DW-NOMINATE scores suggest more conservative legislators. The correlation coefficient between adjusted and raw ADA scores in our sample is .99 in both the 107th and 108th congresses. The correlation coefficient between raw ADA and DW-NOMINATE scores is −.96 in both the 107th and 108th congresses. Adjusted ADA and DW-NOMINATE scores have a correlation coefficient of −.97 in the 107th and −.96 in the 108th congresses.

ADA scores that enhance comparability. While the small time period covered by our sample limits the extent of such concerns,[5] we employ a similar average of these adjusted scores as an alternative dependent variable. Second, Poole and Rosenthal (1997) produce intertemporally comparable ideal point estimates for legislatures using their DW-NOMINATE method. Because this measure employs all non-unanimous roll-call votes in the legislative sessions we study, their use assuages concerns of selection bias due to the limited agenda represented in interest group ratings. In keeping with our measurement strategy, we employ DW-NOMINATE scores for the 107th and 108th congresses as an alternative dependent variable.

Two types of district characteristics form our central explanatory variables. The first provides a continuous measure of the degree of change between the "old" and "new" district represented by the incumbent. Previous scholarship has relied almost exclusively on more blunt measures of redistricting that fail to capture the extent of change to a legislator's constituency (see, e.g., Stratmann, 2000). Unfortunately, such blunt measures do not allow us to address whether legislators are more likely to modify their behavior as their districts undergo more radical changes—especially those resulting from districts redrawn by redistricting commissions or panels of judges (Carson and Crespin, 2004).

Crespin (2005) constructed the continuous measure of district change we employ for the 2000–02 redistricting cycle by using geographic information systems (GIS) mapping technology, congressional district and census tract files, and census population data.[6] Our variable registers the percent of new voters (n) added to the district by the redistricting; thus it takes a value of zero for all members in the 107th Congress and also in the 108th Congress for any MCs whose district did not change (36 of the 488 MCs in our dataset). This variable permits us to analyze the impact of changes in constituency in the empirical models described below. The principal advantage of this variable is that it assesses a permanent change in voters, rather than a temporary shock to the political-economic environment of the district as precipitated, for example, by a major business or military base closure. As the proportion of new constituents in a district increases as a result of redistricting, we claim that while legislators should be more likely to modify their roll-call voting behavior in response to the increased uncertainty associated with changes in the voters they represent, this will be moderated by the incumbency protection aspect of redistricting.

Ideally, our measure of district change would include a distinct partisan component that captures the flow of Democrats and Republicans among districts as a result of boundary modifications. Such data are unfortunately not available. We employ a measure of district change that only reflects the percentage of new voters within the redrawn congressional district. To capture partisanship in congressional districts, we rely on a district-level variable that follows from the more conventional measures that have been used in prior studies of legislative behavioral change (see, e.g., Boatright, 2004; Glazer and Robbins, 1985; Stratmann, 2000). This measure, Democratic presidential vote (v), was drawn from Congressional Quarterly's *Politics in America*, and registers the difference in two-party vote share for the Democratic candidate in 2000 and the recalculated vote share of the same candidate within the redrawn district boundaries in 2002. As others have noted (see, e.g., Jacobson, 2000; Brady et al., 2000), presidential vote share at the district-level can serve as a proxy for constituent preferences, and changes in the presidential vote share from one election to the next (as a result of changes in the composition of the district) can therefore reflect directional shifts in these underlying preferences. Moreover, a legislator who represents a district that has been significantly altered through redistricting may be more likely to exhibit behavioral changes (versus their colleagues who are affected less by redistricting changes) as a function of seeking to represent their new constituency, especially if it reflects a distinct partisan change among the electorate. We also include a measure of the incumbents' electoral security, coded as the percentage of the two-party vote each legislator received in the previous election (p).

We observe the variables described above for all members during the 107th and 108th Congresses to form a panel dataset with two periods and 388 legislators who served in both congresses. We assess our claim by taking advantage of the panel structure of the data to explicitly consider member-specific effects on roll-call voting. Formally, we estimate the following "within-effects" (or fixed-effects) regression:

$$y_{it} = \alpha + n_{it}\beta_1 + v_{it}\beta_2 + p_{it}\beta_3 + u_i + \varepsilon_{it} \quad (1)$$

where i indexes members and $t \in [107, 108]$ indexes congresses pre- and post-redistricting. The regressors described above are measured for each legislator in each of the two congresses in the sample. Member-specific intercepts or "fixed effects" are denoted u_i and ϵ_{it} is a disturbance term. In the same way that a cross-sectional least-squares regression explains variation around the mean of the dependent variable, the fixed effects estimator provides leverage on the redistricting problem only as a member's revealed ideology from roll-call voting (y_{it}) is correlated with values of n_{it}, v_{it} , and p_{it} above the mean value of those variables for legislator i across both the pre- and post-redistricting congresses. As such, it takes account of only that information that varies "within" a legislator (Wooldridge, 2002, 269).

We also estimate the "between-effects" regression:

$$\overline{y}_i = \alpha + \overline{n}_i\delta_1 + \overline{v}_i\delta_2 + \overline{p}_i\delta_3 + u_i + \overline{\varepsilon}_i \quad (2)$$

[5] In our sample, membership change was minimal with approximately 90 percent of the membership of the 107th Congress also serving in the 108th Congress. This yields minimal change between adjusted ADA scores and the nominal ADA scores we employ in our analysis, and this is evidenced by the fact that across all years in our sample (2001–2004), the correlation between adjusted and nominal ADA scores is 0.995.

[6] See Crespin (2005) for a more detailed discussion of how this continuous measure of district change for the 2000–02 redistricting cycle was created. Unfortunately, this measure does not exist prior to the 2000–02 redistricting cycle, which currently makes it impossible to extend our analysis further back in time.

In this model, the dependent variable, time-varying covariates, and disturbance term enter in the form of averages across t for legislator i. The leverage in this model comes from information about differences "between" legislator i and her colleagues. (Wooldridge, 2002, 269).[7] The pooled OLS estimator often used in the literature on congressional elections is a matrix-weighted average of eqs (1) and (2), but this parsed approach allows us to examine the effect of redistricting on the floor (the between effect) as well as on the individual member (the within effect).

Our claim has been that individual legislators might change their voting only slightly, maintaining consistency in their record, but the effect of the new voters introduced into these districts on floor voting is substantially greater. Thus, we hypothesize that the absolute value of the between effect of new voters is larger than the within effect, $|\delta_1| > |\beta_1|$.[8]

Our method views redistricting as a "treatment" and conducts a pre-post test, a common technique for statistical, policy-analytic case studies examining the effect of a policy change (see, for example, Card and Krueger, 1994, examining the effect of a rise in the minimum wage in New Jersey). The between estimator provides evidence of the impact of new voters on the mean floor voting patterns before and after redistricting. As such, it provides information about the impact of average new voters on voting in the post-redistricting Congress as a whole, on differences among its members. Such mean changes imply shifts in the voting distribution—such as agenda effects brought on by new leadership—and are clearly related to incentive-based explanations for partisan redistricting. If partisan mapmakers can favorably change the mean voting pattern in Congress by shifting constituents among legislators via redistricting, the incentive to engage in redistricting is quite high.

The within estimator focuses on voting changes for MCs from the 107th to 108th Congress; it permits an examination of how much individual voting records—not the congressional mean—change given the redistricting. A large within effect means that as a result of redistricting, individual legislators change their voting records substantially in relation to their pre-redistricting performance. This would fly in the face of the incumbency protection and uncertainty coping notions described above. Again, we anticipate a larger absolute between effect. A within effect of zero implies excellent incumbency protection as a result of the redistricting plan.

3. Results

We report summary statistics for the key variables in Table 1. Results for the 'between' and 'within' estimator effects for our preferred specification are reported in Table 2. Based on these estimates, it is clear from both models that geographic boundary change and the corresponding uncertainty that arises from representing 'new' voters affects congressional voting decisions. Elasticities are reported in columns 3 and 5 of Table 2. The between-effects model suggests that the sample average 11.71 percent change in voters due to redistricting is associated with a decrease in the congressional mean ADA score of 2.73 percent; recall that a decrease in this case means that ideology moves in a conservative direction in a redistricting cycle largely dominated by Republicans. The within-effects estimates indicate that the sample average change in voters is associated with slightly less than a one percent increase—movement in a liberal direction—in congressional mean ADA scores. In the alternative models using adjusted ADA and DW-NOMINATE scores presented in Table 3, the within-effects estimate for the impact of new voters on member behavior is statistically zero, suggesting the strongest degree of incumbency protection.

These effects provide strong support for our story. They imply that permanent changes in constituencies implemented via redistricting made average congressional vote patterns more conservative. On the other hand, individual legislators who survived the first election in their new districts changed their voting patterns only slightly, while in our preferred specification they moved, on average, in a liberal direction. Given the political landscape in the redistricting cycle we study, this seems consistent with a moderating effect of conservative MCs to deal with uncertainty in advance of garnering the personal vote (Calvert, 1985).

The results in Table 2 also suggest that changes in the overall partisanship of the district (as reflected by presidential vote for the Democratic candidate) exert a significant effect on the ADA scores in the between-effects model, but not in the fixed effects specification. More specifically, we find in both models that as the share of the reconfigured vote for the Democratic presidential candidate increases in

Table 1
Summary statistics.

Variable	N	Mean	Std. Dev.	Min	Max
Average ADA score	768	47.105	41.060	0	100.000
Percent new voters	768	10.917	16.492	0	84.720
Incumbent vote	768	71.271	12.838	32.300	100.000
Democratic presidential vote	768	51.558	14.851	19.687	93.939
Average adjusted ADA score	771	41.082	35.095	−2.367	86.869
Average DW-NOMINATE score	773	0.086	0.477	−0.704	1.096

[7] To examine the impact of time-invariant covariates (such as the presence of a quality challenger, freshman status, and so forth) we estimated a random effects regression that makes use of both within and between information. Effects were substantively similar, but a Hausman specification test failed to reject the null hypothesis that the district-level random effects are uncorrelated with the regressors (Wooldridge, 2002, 264). For this reason, we do not report this model here. Nonetheless, our fixed effects specification captures all unobserved attributes that do not vary "within" a legislator. Regressing these fixed effects on important time-invariant covariates suggests results consistent with the expectations of the literature (see Carson, 2005; Jacobson, 2009).

[8] A note about consistency is worthwhile given the inclusion of member-specific effects in eqs (1) and (2). The within-effects estimator assumes that the u_i are correlated with the regressors by construction and is consistent. However, consistency is not established for the between-effects estimator if the u_i are correlated with any regressors. We employ this approach because our intent is to examine a single redistricting, wherein we have information on all legislators involved. Our examination of the estimates of u_i from the within-effects regression in Section 4 is likewise focused on the 2000–02 redistricting cycle.

Table 2
The Impact of new geographic constituency on congressional voting decisions, between-(BE) and within-effects (WE) regressions, ADA scores, 107th–108th congresses.

DV: average annual ADA score$_{it}$	BE	BE elasticities	WE	WE elasticities
Percent New Voters	−0.460*** (0.116)	−0.233 [−0.359, −0.109]	0.084*** (0.013)	0.020 [0.014, 0.026]
Incumbent Vote	−0.396*** (0.095)	−0.726 [−1.208, −0.244]	0.100*** (0.032)	0.151 [0.056, 0.245]
Democratic Presidential Vote	2.159*** (5.966)	3.936 [3.695, 4.176]	−0.046 (0.106)	−0.051 [−0.278, 0.177]
Constant	−30.977*** (7.617)		41.466*** 5.723	
N	768		768	
Number of MCs	388		388	
R^2	0.51		0.51	
F			20.180	
χ^2	171.862			

Significance ***$p < .01$. Bootstrap standard errors adjusted for clustering on MC based on 1000 replications reported for between-effects regression (Cameron and Trivedi, 2005, ch. 21). Heteroscedasticity-robust standard errors adjusted for clustering on MC reported for within-effects regression (White, 1980). Elasticities are $\partial \ln y / \partial \ln x$ for each regressor with 95% confidence intervals constructed from reported standard errors in brackets.

the redrawn district (compared with members with a smaller change), legislators are individually unaffected across the redistricting cycle. Yet we find that legislators with more Democratic partisans in their district are unsurprisingly more liberal in their voting behavior than members with fewer such constituents. In the between regression, this effect is especially pronounced when we compare it with the variable measuring geographic change in the constituency (percent new constituency), which is smaller relative to district partisanship.

Table 3
The Impact of new geographic constituency on congressional voting decisions, between- (BE) and within-Effects (WE) regressions, alternative measures, 107th–108th congresses.

	Adjusted ADA		DW-NOMINATE	
	BE	WE	BE	WE
Percent New Voters	−0.393*** (0.136)	−0.001 (0.009)	0.006*** (0.002)	0.00002 (0.00004)
Incumbent Vote	−0.315*** (0.111)	0.001 (0.023)	0.002 (0.001)	−0.00004 (0.00008)
Democratic Presidential Vote	184.431*** (6.579)	−8.691 (7.609)	−2.504*** (0.009)	−0.025 (0.031)
Constant	−27.340*** (8.968)	45.677*** 4.206	1.170*** (0.120)	0.102*** (0.016)
N	771	771	773	773
Number of MCs	387	387	388	388
R^2	0.53	0.54	0.54	0.55
F		0.44		0.53
χ^2	171.862***		789.76***	

Significance ***$p < .01$. Bootstrap standard errors adjusted for clustering on MC based on 1000 replications reported for between-effects regression (Cameron and Trivedi, 2005, ch. 21). Heteroscedasticity-robust standard errors adjusted for clustering on MC reported for within-effects regression (White, 1980).

In both models, we observe that legislators with larger vote margins appear to have more leeway in voting behavior. The negative sign on this variable in the between-effects model suggests that as the incumbent's share of the two-party vote increases, incumbents are more likely to vote in a more conservative direction as reflected by changes in ADA scores, and the confidence interval suggests that revealed ideology may be elastic in vote share. This finding is consistent with past research that suggests electoral safety affords legislators greater discretion in their voting patterns since they do not feel as constrained by the pull of their constituency. Nonetheless, the positive impact of this variable within legislators across the redistricting is consistent with our claims about uncertainty. The sample average incumbent—representatives such as John Larson (D-CT) or Frank Wolf (R-VA)—had solid support in his own constituency, and would become slightly more liberal in roll-call voting as his security in terms of vote share rose.

Table 3 shows the results of models using congress-averaged adjusted ADA and congress-level DW-NOMINATE scores as the dependent variable. Our results are robust when using either of these measures. Note that the sign reversal for the new voter effect in the DW-NOMINATE between-effects regression is expected because higher values of DW-NOMINATE scores indicate more conservative legislator voting behavior, while the opposite is true for ADA and adjusted ADA ratings. As noted, the results for the between effect of new voters are statistically zero in these models, supporting our hypothesis as the between effect is larger than the within effect. Indeed, the fixed (within) effects models show that incumbent and Democratic presidential vote shares are not significant when partialed out of the unobserved legislator characteristics represented by the fixed effects. In sum, we find strong support for our claim.

The fixed effects from our preferred specification can be used to illustrate some facets of the redistricting cycle we study. We now turn to a fuller discussion of the 2000 redistricting case to further our understanding of the partisan nature of the impacts we have shown and suggest a mechanism that may be accounting for the patterns we observe. We then conclude the paper with some implications of our analysis for future research.

4. Discussion

Following the celebrated off-census redistricting in his home state a year earlier, twelve-term incumbent representative Ralph Hall of Texas' 4th district switched his affiliation from the Democratic to the Republican Party in 2004. Hall's new party affiliation appears directly linked to the partisan makeup of his newly redrawn district, but not necessarily indicative of any significant change in his own political ideology; *The Economist* (October 14, 2004) labeled him a "conservative Democrat" in an article discussing the Texas redistricting. Martin Frost, a thirteen-term incumbent Democrat in the Texas 32nd district found his district abolished and competed unsuccessfully against Pete Sessions for the votes of the new constituency, an affluent population that is largely Republican. During the election

campaign, Frost sought support from traditionally Republican demographics while Sessions received seemingly unsolicited support from the community. Both Hall and Frost faced an uncertain future due to an infusion of new voters into their constituencies (*CQ Weekly* June 19, 2004).

In the classic work on the electoral connection in the U.S., Mayhew (1974, 99) writes, "What is important to each congressman, and vitally so, is that he be free to take positions that serve his advantage. There is no member of either house who would not be politically injured—or at least would not think he would be injured—by being made to toe a party line on all policies (unless of course he could determine the line)." The member-specific effects (u_i) in the within regression provide some information for speculating about the impact of the 2000–02 redistricting on position taking through roll-call voting. Figs. 1 and 2 graphically present these individual member effects in relation to the magnitude of new voters brought into members' constituencies as a result of redistricting. Recall that these effects are an intercept shift; positive values imply that given the constituency characteristics included as regressors in our model, a legislator was more liberal than the constituency would suggest and negative values are correspondingly associated with "excess" conservatism on the floor. This interpretation is similar to that employed in production economics. For example, Atkinson and Cornwell (1994) use predicted unit effects from shadow cost functions to measure allocative efficiency among firms. Yet unlike those authors, we do not make claims to consistency of these estimates on the basis of large sample properties. Our claims about these effects are restricted to member behavior across the 2000–02 redistricting cycle only, for which our data achieve full population coverage.

Fig. 1 shows the mean member-specific effects by decile of the distribution of new voters induced by the 2000–02 redistricting with the numbers along the left border indicating the maximum value in the decile. The pattern strikingly shows a threshold effect; as the number of new voters exceeds 60 percent of the constituency, excessive ideological voting in both directions ensues. Among those members whose constituency changed more than 70 and

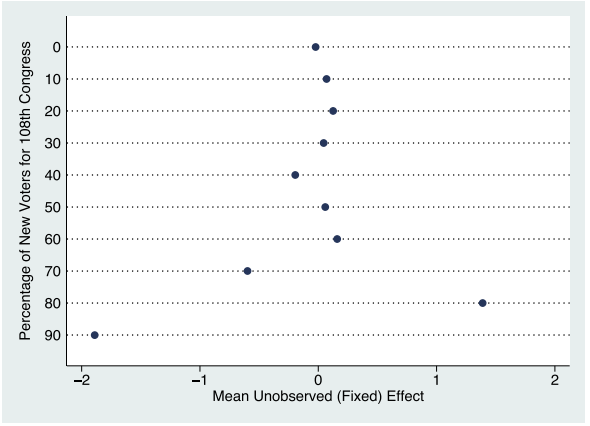

Fig. 1. Member-specific fixed effects by decile of new district voters, 107th–108th congresses.

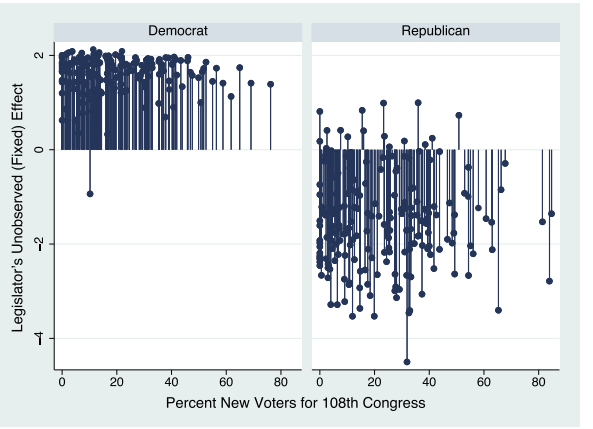

Fig. 2. Member-specific fixed effects by new voters and party, 107th–108th congresses.

less than or equal to 80 percent, we find Mark Kennedy (D-MN) who was a conservative freshman in the 108th Congress, and conservatives Pete Sessions (R-TX)—whose unsolicited support from new conservative voters helped to motivate the above discussion—and J.D. Hayworth (R-AZ) who had prior vote margins in the 60th percentile suggesting marginality. These members were substantially more liberal than their constituency characteristics would suggest. With those having new voters in the 80th percentile, we find Loretta Sanchez (D-CA), the moderate Democrat who unseated Bob Dornan in Orange County, Leonard Boswell (D-IA) with a prior vote share of 54.3 percent, and John Carter (R-TX), a freshman in the 108th Congress. All were considered marginal legislators, and all more liberal than constituency characteristics would imply. This picture suggests that overcompensation in voting records is associated with less legislative leeway even in the context of redistricting.

Fig. 2 looks at member-specific effects by party, highlighting those members whose personal intercepts conflict with those of the bulk of their partisan colleagues. The sole conflict among Democrats is Ralph Hall of Texas, the party-switcher with whose story we began. Hall's previous positions were expressed as a member of the Republican caucus. Among Republicans, five outliers are noticeable. James Leach of Iowa lost a bid for reelection to the 110th Congress after 15 terms of service. This is most likely a function of the dramatic shift in voters within his district following the 2000–02 redistricting—nearly 36 percent of his revised district constituted "new" voters. The outliers also include three incumbent legislators from Connecticut—Christopher Shays, Robert Simmons, and Nancy Johnson—who were considered electorally marginal before the redistricting and faced increased uncertainty from a substantial number of "new" voters.[9] Shays' and

[9] Shays won a close election to the 110th Congress after a more comfortable victory in 2002, while Simmons' share of the 2002 vote was 51.5 percent. Johnson narrowly survived in 2002 with 54.3 percent of the vote, but lost her bid for reelection in 2006. Shays was eventually defeated in 2008 when he sought reelection to the 111th Congress.

Simmons' districts encountered less than 50 percent new voters (15.5 and 23.3 respectively). Johnson's district, by contrast, changed by more than 50 percent following the 2000–02 redistricting. Note that Fig. 1 shows that for this redistricting cycle, the average member-specific effect for these levels of new voters was approximately zero. Moderate Michael Castle of Delaware,—with a mean ADA score of 45 for the 108th Congress—was unaffected by redistricting.

Can a more general theory account for the pattern of small, individual behavior changes on average leading to larger floor voting changes that benefit the "winning" party in a partisan gerrymander? We believe that the mechanism that unifies these lines of inquiry is rooted in uncertainty about constituency pressure through the electoral connection. Partisan redistricting strategies manipulate the personal vote (the proportion of votes the incumbent receives due to personal characteristics) by using the uncertainty that new voters introduce to impose costs on redistricted minority-party incumbents while raising the electoral chances of their majority-party colleagues. Put simply, new voters create risk for the incumbent regarding the gains she can realize from her personal vote; new voters may not value the inputs to the personal vote in the same way as "old" voters have done. Partisan gerrymanders create a risk-sharing mechanism—an implicit agreement between party and candidate—that achieves partisan legislative goals without requiring any single member to change their voting behavior so substantially as to harm their reelection chances. As a result, partisan gerrymanders shift public policy while protecting incumbents who can maintain their reputational capital and work to strengthen their personal vote among the new constituents.

Our results are consistent with a scenario in which legislators protect ideological reputations while floor voting—and through it, public policy—can substantially benefit the majority-party's legislative record. The success of the party's record, in turn, helps the electoral fortunes of its members (Cox and McCubbins, 2005). Such risk-sharing helps to ensconce an incumbency advantage into low-magnitude electoral systems. Given that most districts only change moderately, we should not expect to find dramatic shifts in legislative behavior post-redistricting. Nevertheless, we do believe that even moderate changes in district boundaries, and the resulting influx of new voters, can lead to party policy gains that are quite pronounced as a result of the tradeoffs associated with risk-sharing. We believe that a fruitful line of inquiry can be built from these foundations.

5. Conclusion

District boundary changes have important impacts on party politics, public policy, and representation in small magnitude electoral systems. In the context of legislative voting behavior, students of congressional politics have long debated the extent to which constituents influence the roll-call voting choices of their elected representatives. While legislators themselves often behave as though the constituency is largely driving their behavior in their endless reelection quest (Mayhew, 1974), there is much less systematic evidence which supports this view. Indeed, a number of past scholars have identified little, if any, systematic evidence of constituency influence on legislative voting behavior, often concluding that representatives are typically more responsive to partisan cues or their personal preferences.

In this paper, we take advantage of the changes in congressional districts in the decennial redistricting process to systematically examine whether geographic and partisan constituency alterations impact legislators' behavior ex post. By evaluating the extent of any change in each legislator's district in connection with their behavior on roll-call votes, we can systematically investigate whether legislators who undergo greater changes in their constituency alter their voting behavior in response to the increased uncertainty associated with new voters. This is precisely what we find in analyzing voting behavior in the 108th Congress following the 2000–02 redistricting cycle. The variation in the geographic boundaries of congressional districts influences member voting on roll calls as reflected by changes in ADA scores pre- and post-redistricting. In a redistricting that advantaged Republicans more than Democrats on average, we observe that the average legislative voting record for legislators became more conservative as new voters were added to districts. We also find evidence that legislators modify their voting behavior to reflect the underlying ideological changes in the constituency, but that this movement was slight and in a liberal direction.

Our results have numerous implications for future research. For instance, if one could derive a similar measure of district change, it would be useful to extend our analysis backward in time to determine if analogous patterns of behavioral change among legislators are observed in connection with other redistricting cycles. The effects for constituency change that we find suggest that analyses of earlier periods may benefit from a more nuanced measure of district change in conjunction with the partisan nature of that change. As noted, Stratmann (2000) treats a congressional district as different if more than 50 percent of the geographic area in the district differs from previous boundaries. Our results suggest that this measure may be too blunt to analyze constituency impact on roll-call voting in the contemporary era given how little many districts change during the redistricting process. But the picture of member-specific effects in Fig. 1 suggests that at least for the 2000–2 redistricting, 50 percent was not an unreasonable cut point. As analyses become more historical in nature, it would be advantageous to examine the extent to which nuance in measuring changes in constituents matters at other snapshots in time.

It also might be beneficial to seek evidence of behavioral *change* on different subsets of roll-call votes (i.e., roll calls that are more salient to constituents versus ones that are more important to the party leadership). If certain roll calls such as final passage votes are more visible to constituents, then we might expect legislators to be more responsive to their constituents on these types of votes versus those that simply deal with procedural matters in the chamber (on this point, see Crespin, 2010). Our findings likewise have important implications for analyses that seek to understand the differential impact of party pressure versus

constituency influence on roll-call choices. Further examination of these issues should serve to enrich our understanding of the various factors that influence a legislator's voting behavior on a regular basis.

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