Redistricting and Polarization

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Corrected Manuscript Forthcoming in

American Gridlock: The Sources, Character, and Impact of Political Polarization,

2015, James A. Thurber, Antoine Yoshinaka (Eds), Cambridge University Press.

- We review how the ideological polarization of members of the House of Representatives (elite polarization) is affected by:
  - sorting of parties’ incumbents into more ideologically compatible districts,
  - replacement of incumbents by more ideologically extreme successors,

* Authors are listed in alphabetical order. We describe contributions to the chapter using a standard taxonomy (Allen et al. 2014). Micah Altman and Michael McDonald were the lead authors, taking equal responsibility for revisions. Michael McDonald authored the first draft of the manuscript and was primarily responsible for the statistical analysis. Both contributed to the conception of the report (including core ideas and statement of research questions), to the methodology, to the project administration, to the data collection, and to the writing through critical review and commentary.
the drawing of more ideologically extreme districts.

- We show there are fewer competitive congressional districts – having a near balance of Democrats and Republicans – following redistricting.

- We show that more competitive districts can be drawn without sacrificing other values, such as compactness or minority representation.

- We discuss the prospects for redistricting reform.

Increasing ideological polarization of American political elites ("elite polarization") has coincided with a marked increase of policy gridlock within the national government. Concerns with the government’s ability to address major policy issues, even those with broad public support, have led many to search for causes for and solutions to a government so paralyzed that it cannot satisfy the basic democratic value of executing the will of its people.

Among the frequently cited causes for elite polarization is redistricting, the process of periodically drawing district boundaries to ostensibly align them with communities of interest, representational criteria, and neutral administrative goals, such as equalizing populations following a new decennial census. States are responsible for drawing House of Representatives district boundary lines; in most states, politicians are in charge of the process, creating an obvious conflict of interest because redistricting affects their chances of reelection.

Redistricting’s potential contributions to elite polarization emerge from the motives of individual politicians and political parties. District boundary lines may be manipulated to affect election outcomes by shoring up an otherwise competitive
district (a district with a near balance of Democratic and Republican voters) by adding supporters of the party one wishes to advantage or subtracting the opposition. In redistricting, there are opportunities for bipartisanship that elude national policymaking: one incumbent’s trash is another's treasure, whereby incumbents of different parties swap constituents unfavorable to their party, but support the other. If legislators reflect the will of their constituents, elite polarization increases when districts are made more ideologically homogeneous as reelection-seeking incumbents have less reason to moderate their positions to win over independents or the other party’s supporters.

Reformers have amended the redistricting process in a handful of states to impose limitations, including most recently in New York through a 2014 constitutional referendum approved by voters. Among the technical innovations that quietly emerged during the last round of redistricting is public access to web-deployed redistricting software and data, which enabled greater public participation in the drawing of alternative redistricting plans (Altman and McDonald 2014b). The public approaches redistricting in a fundamentally different manner than politicians, particularly with respect to political goals such as partisan fairness and district competition (Altman and McDonald 2013, 2014a, 2014c). These public plans thereby provide a benchmark comparison to plans fabricated by politicians to concretely assess how districts may be made more competitive through reform efforts and to what degree this may ameliorate polarization.
The Causal Relationship between Redistricting and Polarization

Much has been written about the causes and consequences of political polarization, including by the contributing authors to this volume. Our purpose is not to rehash the extensive polarization literature. However, we do wish to provide context for redistricting’s role. In Figure 1 we sketch how redistricting fits within theoretical frameworks explaining elite polarization of the House of Representatives. The linkage between redistricting and elite polarization is mediated through district partisanship, as visualized in Figure 1. The causal chain from redistricting to elite polarization has two necessary conditions. First, the ideological character of districts’ constituencies must be related to the ideological character of their elected representatives. Second, redistricting must be able to affect districts’ ideologies. We begin our discussion of the first order causal connections with causes that directly
affect elite polarization, and then with second order causal connections affecting these first order causal connections.

**First Order Connection: District Partisanship → Elite Polarization**

With respect to the first condition, there are no reliable national survey measures for the ideology of districts' constituencies since sample sizes within districts are typically too small to develop reliable measures. Scholars frequently measure districts’ ideologies using districts’ partisanship, constructed from election results for statewide offices (McDonald 2014). Presidential election results are analyzed for national studies since this is the sole office elected nationally, thus providing a comparable metric across all congressional districts. We follow the scholarly norm equating district ideology with district partisanship.

The median voter theorem provides a theoretical basis to expect that district partisanship is a factor in representatives’ ideologies. Downs (1957) formally shows how in plurality-win two-candidate elections, candidates who wish to win office will, in equilibrium, position their ideology such that it is the same as the district’s median voter’s ideology, in an electorate where all voters are distributed along a one-dimensional left-right ideological continuum. (This is, of course, a caricature of Downs’s nuanced theory; we discuss complications and other motives subsequently.)
The logic is simple and, in the abstract, plausible. Consider a candidate whose primary motivation is to get elected. A candidate wins office by receiving 50 percent plus one of the votes. If voters prefer the candidate with the closest ideology, then without knowing what the other candidate will do, the first candidate is always best off positioning his or her ideology at the median voter. There are two cases to consider. Case one: if the second candidate positions at any point other than the median, the first candidate on the median is supported by all voters to the left or right (those with an ideology in the opposite direction from the median as the second candidate’s position), as well as half of the voters between the median and the ideology of the second candidate. The first candidate wins and the second loses. Case two: if the second candidate also positions at the median voter, then voters are indifferent between the two candidates and they randomly choose between the two candidates. A first candidate who chooses a position other than the median is gambling that the other candidate will position his- or herself even further from the median. Why take this risk when there is a clear pathway to victory by positioning at the median?

The redistricting application is straightforward. The ideology of the median voter of a district is related to the proportion of voters on the left and right (i.e., Democrats and Republicans) who are assigned to a district. If more voters on the left or right are added to a district, the ideology of the median voter of the district will be a voter further to the left or right, respectively. Those in charge of redistricting thus have the ability to affect not only which party is favored to win a
district, but, by manipulating the proportion of voters in a district on the left or right, the ideological character of the winning candidate as well.

To empirically demonstrate the relationship between district partisanship and elite polarization, which we will refer to again when we describe other causal pathways, we plot a measure of district partisanship against a measure of members’ ideology in Figure 2. Our measure of district partisanship is the McCain share of the Obama and McCain 2008 presidential vote, or what is commonly called the two-party vote. A higher percentage thus describes a more Republican district. We might reasonably infer that district partisanship proxies constituents’ ideology, with a more Republican district signaling a more conservative constituency. Our measure of members’ ideology is Poole and Rosenthal’s (2000) first DW-NOMINATE dimension, which places members’ roll call votes on a left–right continuum, with higher values related to a more conservative roll call vote history. NOMINATE scores are endogenous to Congress, meaning that they are based on observable roll call votes that are the end product of the legislative process, and may not be true measures of members’ ideology. If one cares about elite polarization within Congress, they serve as a static snapshot of the current Congress. We further identify Democrats with a D and Republicans with an R, and draw a simple linear regression line for each partisan type.

There are three important features of Figure 2: (1) the correlation between district partisanship and members’ ideologies, (2) party divergence of members from different parties representing districts with similar partisanship, and (3)
candidate divergence among members of the same party representing districts with similar partisanship. We first discuss the first feature and return to the two others.

**Figure 2** District Partisanship and Representatives’ Ideology

Central to the argument that redistricting can affect polarization, and consistent with the median voter theorem (Downs 1957), there is a strong linear relationship between districts’ partisanship and members’ ideological voting patterns, with members from more Republican districts voting in a more
conservative manner. Figure 1 is not controversial. This pattern of candidate convergence to the district ideology is presented in textbooks (Abramson et al. 2014) and confirmed by an analysis of all candidates’ ideologies – incumbents, challengers, and open seat candidates – derived from members’ ideological voting scores (Ryan and Lyons 2014) and candidate surveys (Erikson and Wright 1980; Ansolabehere, Snyder, and Stewart 2001; Stonecash et al. 2003;). This convergence is evident in other legislative activities, such as bill sponsorship and roll call voting within specific issue domains that may be sensitive to constituency demographics (Hayes, Hibbing, and Sulkin 2010). Ansolabehere, Snyder, and Stewart (2001) find candidates more closely hew to district partisanship in the most competitive districts near 50 percent (this heteroskedastic dynamic is most apparent among Republican incumbents in Figure 1), although they also find that challengers to incumbents less closely converge to district partisanship than incumbents.

First Order Connection: Party Divergence → Elite Polarization

A second feature that is illustrated by Figure 2 is a sizable ideological gap between the two political parties. An increasing ideological gap between the political parties is well documented and has grown so much that there is currently no overlap between the most conservative Democrat and most liberal Republican (McCarty,
Poole, and Rosenthal 2009; see also Chapter 16, this volume). Contributing to this elite polarization is a decline in the number of incumbents who represent districts with a voter composition – measured in presidential vote – favoring the opposing party, a phenomenon that continues following the 2014 election. This decrease is a consequence of the sorting brought about through the sectional realignment of the South and Northeast. Before the recent rise in elite polarization, conservative Southern Democrats and liberal Northern Republicans filled the ideological center between the more extreme elements of their respective party caucuses. In recent decades, Southern Democrats either formally affiliated themselves with the Republican Party or a Republican claimed their seat following a retirement or electoral defeat (setting aside Southern Democrats representing minority communities). While regional realignment was most pronounced in the South, a mirrored dynamic occurred among liberal Republicans in the North. Redistricting may also affect sorting, when incumbents mismatched with an unfriendly constituency are drawn in a new, ideologically compatible district (Jacobson 2003; McCarty et al. 2009); we discuss this in greater detail later in the chapter. Parties have thus become more ideologically consistent (Fiorina and Pope 2010; Layman et al. 2010), which results in a further feedback mechanism whereby members of more ideologically homogeneous party caucuses provide their leaders additional powers to enforce party discipline, what is known as the conditional party government model (Rohde 1991).

A caricature of Downs (1957) portrays the median voter theorem as predicting candidates’ full convergence to the median, framing divergence as a
“failure” of the model (Ansolabehere, Snyder, and Stewart 2001: 153). Downs did not predict full convergence, as he could observe the obvious fact – even in 1957 – that in America’s two-party system the parties’ candidates were not ideological clones. Downs posited that parties would not adopt the median position within a district in order to distinguish themselves from one another and thereby present voters with tangible choices. But there are other compelling reasons for divergence. As evident from the distribution of districts across the X-axis in Figure 2, districts do not have the same partisanship, so candidates within party coalitions would be hard pressed to simultaneously adopt individual ideologies consistent with an overarching national party ideology (see contributions in Grofman, Blais, and Bowler 2009). There may be other reasons for this dynamic as well, such as candidates having intrinsic policy preferences of their own, being reputationally bound to their previous policy positions, being responsive to both more ideologically extreme primary and more centrist general election electorates within the same district (Brady, Han, and Pope 2007), or that entry costs deter politically moderate citizens who may wish to run for office (Grosser and Palfrey 2014).

**First Order Connection: Candidate Divergence → Elite Polarization**

A third feature illustrated by Figure 2 is that within parties there is sizable variation of ideology even among members in districts with comparable district partisanship. This is more evident in the Senate, where senators who are of the same party and
who represent the same state have different ideologies (Poole and Rosenthal 2000). It is also evident in how members from the same party replacing a retiring incumbent do not adopt the same ideology (Poole and Romer 1993; Stonecash, Brewer, and Mariani 2003; Theriault 2006). Indeed, these replacements have tended to adopt a more extreme position than their predecessor, thereby contributing to polarization with moderates being replaced by extremists (Bafumi and Herron 2010). Incumbents may also adapt to changing political environments by modifying their ideological voting over the course of their careers (Theriault 2006), with members moving toward their district partisanship (Stratmann 2000). It is for this latter reason that we draw a causal arrow from candidate divergence to elite polarization, although Figure 2 snapshot suggests there is much ideological variation among members representing districts with similar partisan composition, which is not necessarily contributing to ideological divergence of parties.

**Second Order Connection: Redistricting → District Partisanship**

The second condition necessary for redistricting to affect elite polarization is that redistricting affects district partisanship. It may seem self-evident from observing the intense politics that surround redistricting, and the related problem of gerrymandering, that a causal connection between these two exists. Indeed, many scholars find redistricting affects partisan division of power among legislative seats (e.g., Tufte 1973; Cain 1985; Gelman and King 1994; Hirsch 2003), while others
have proposed evaluation metrics on how much partisan gerrymandering may be constitutionally permissible (Grofman and King 2007). However, this second order effect is challenged by competing explanations for changing district partisanship, particularly the number of competitive districts that, through the connection of district partisanship and members’ ideologies, drive elite polarization.

Abramowitz, Alexander, and Gunning (2006) and McDonald (2006a) differ in their conclusions about whether redistricting results in fewer competitive districts. The measurement of competitive congressional districts using presidential elections lies at the heart of their divergent findings. Analyzing normalized two-party presidential vote, Abramowitz et al. (2006) find an increase in competitive districts during the post-1990 census between the 1988 Bush vs. Dukakis contest and the 1992 three-way Bush vs. Clinton vs. Perot contest (excluding Perot’s votes since he was not a major party candidate). However, in analyzing the Bush and Dukakis vote in the pre- and post-redistricted districts, McDonald (2006a) finds a decrease in the number of competitive districts.

We update McDonald’s (2006a) analysis of the total number of competitive districts before and after redistricting for the most recent round of redistricting in Figure 3. The table reports the number of districts within two competitive ranges,

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1 “Normalized two-party vote” is the vote share for a major party candidate expressed as a share of the two major parties’ candidates, excluding minor party candidates. This vote share is then normalized, or simulating a hypothetical 50/50 election, by subtracting the difference between the overall national two-party vote share and 50 percent from the two-party vote within a specific district.

2 For similar findings in the decline in competition following a redistricting, see Swain, Borrelli, and Reed (1998) and McCarty et al. (2009: 673).
45–55 percent and 48–52 percent (the latter are included in the former). The vote between the two major party candidates (commonly referred to by scholars as the “two-party vote”) is drawn from various issues of the *Almanac of American Politics*. The presidential vote shares are normalized by subtracting the difference between the leading candidate’s vote share and 50 percent to simulate a hypothetical 50/50 election. To control for potential confounding campaign effects, statistics are calculated for the same presidential election, the one most recently occurred prior to a given redistricting.

*Figure 3* Competitive Districts Before (Red) and After (Blue) Redistricting, 1980–2012
Take, for example, the 2008 presidential election, whose results are reported for the 2010 and 2012 statistics. The statistics in Figure 3 show that for the most recent redistricting, there was a slight decrease of four districts within the wider competitiveness range and a decrease of twelve districts in the narrower
competitiveness range. Despite the traditional reliance on a 45–55 percent to define competition elections (Mayhew 1974), McDonald (2006a) finds from a statistical analysis correlating presidential vote and candidate vote shares that the narrower range is more appropriate to measure competitive districts. Both numbers are near the lower bound evident in the last two redistricting cycles. In the larger picture, except for the 1980 cycle, there was a decrease in the number of competitive districts in the narrower range in the 1990, 2000, and 2010 redistricting cycles, and for the wider range there was also an increase in 1990, 2000, and 2010 but an increase in 1980. Using Abramowitz et al.’s (2006) preferred measure, the 2012 normalized two-party vote, compared to the 2008 presidential vote, only strengthens these findings. The preponderance of the evidence shows redistricting results in fewer competitive districts in the past three decades.

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3 An issue for the post-redistricting statistics is that some precincts are split by new districts, and the votes within these districts must be apportioned to the new districts (McDonald 2014). Using the 2012 presidential vote shares for the 2012 statistics, the number of districts is 84 within a 45–55 percent range and 29 within a 48–52 percent range. This alternative measurement provides stronger evidence for redistricting to result in a decrease in the number of competitive districts. Whereas the statistics reported in Figure 3 show a modest decrease of four in the number of competitive districts in the wider range between 2010 and 2012, the alternative measure shows a 30-district decrease. Similarly, whereas the statistics reported in Figure 3 show the narrower range has a twelve-district decrease in competitive districts, the alternative measure has a thirteen-district decrease.
Second Order Connection: Geographic Sorting → District Partisanship

Redistricting can manipulate directly only district partisanship, but to what extent is manipulation possible? In states with a small number of districts – or just one – manipulation of district partisanship is neigh impossible. Even within larger states, scholars contest whether redistricting can affect district partisanship. The argument for minimal redistricting effects arises from research that argues Americans have residentially segregated themselves (Bishop and Cushing 2009). Such geographical sorting produces, so the argument goes, an increasing political homogenization of congressional districts (Abramowitz et al. 2006) that virtually locks in Republican majorities absent Democratic gerrymandering (Chen and Rodden 2014). The correlation between districts’ partisanship and members’ ideology evident in Figure 2 thus emerges organically from states’ geographies, not through conscious redistricting manipulation.

Evidence for this “big sort” thesis is derived from county-level presidential election results from 1976 to 2004, which show that the number of landslide counties with a victory margin of 20 percentage points or more increased from 27 percent to 48 percent during this period (Bishop and Cushing 2009). Scholars have challenged these findings. Klinkner and Hapanowicz (2005), taking a longer view, show substantial up-and-down variation in the number of landslide counties between 1976 and 2004, with the rise between these two elections falling within the historical range from 1840 to 2004. Abrams and Fiorina (2012) object to the
reliance on presidential election results, noting that presidential candidates are not all the same and, thus, polarization measured by presidential election results may be an artifact of the choices voters are presented with; even if voters remained the same, two moderate candidates may produce different geographical distribution of votes than two extreme candidates. Utilizing an alternate measure freer from transitory campaign effects – party registration – there was a decrease in landslide counties from 1976 and 2004 (McGee and Krimm 2009).

The statistics presented in Figure 3 also do not conform to the big sort thesis, although we do not wish to take too much from statistics drawn from different presidential elections. There was a slight increase in the number of competitive districts between 2002 and 2010, in both the wider and narrower ranges. If ongoing geographical sorting of partisans is primarily responsible for a decline in competitive districts (Abramowitz et al. 2006), there should have been a decrease in the number of competitive districts over the last decade.

**Second Order Connection: Regional Realignment → District Partisanship**

In Figure 1 we draw an arrow from regional realignment to party divergence, but the party divergence theory implicitly involves district partisanship. As Jacobson notes (2013: 548) “over the last several decades, changes in the preferences, behavior, and distribution of congressional voters have given the congressional

\[ \text{district partisanship} \]

Furthermore, Abrams and Pope (2012) argue that Americans are not polarized geographically; however, this critique is outside the scope of our analysis.
parties more internally homogenous, divergent and polarized electoral bases ... The main source of this electoral transformation was the partisan realignment of the South.” The representational anchor for Southern Democrats were their conservative constituents. If members had represented liberal constituencies, as Democratic members did elsewhere, they probably would not have been so conservative, likewise so with their Republican replacements (if regional realignment would have even occurred). Yet, party divergence is not typically presented laying bare these assumptions as Jacobson does, so we draw only dotted arrows from regional realignment to district partisanship to party divergence.

The regional realignment story, when framed as affecting district partisanship, has a potential interaction with redistricting. Southern Democrats attempting to stave off extinction were thwarted by the George Bush, Sr. Department of Justice following the 1990 redistricting. The Department of Justice ordered Southern Democratic-controlled state governments to maximize the number of African-American majority districts, a tactic that the U.S. Supreme Court would later find unconstitutional in the Shaw v. Reno cases. But the damage was done. Grofman and Handley (1998) find that without enough African-American constituents to buoy their electoral fortunes, some Democratic incumbents succumbed to mounting pressures of regional realignment.

5 Today, with Democratic-controlled Southern state governments replaced with Republican-controlled state governments, the Voting Rights Act in some instances forced Republicans to draw Democratic districts where they may otherwise not wish to do so (Schotts 2002).
**Full Causal Path: Redistricting → District Partisanship → Elite Polarization**

As the preceding discussion should make plain, redistricting cannot be responsible for all elite polarization. Scholars find redistricting makes a contribution. Stonecash, Brewer, and Mariani (2003) examine changing district composition and conclude these changes produce more homogeneous districts that contribute to polarization. However, these scholars do not decompose the factors driving changing district demographics. Stronger direct evidence that redistricting affects polarization comes from studies that examine districts changed by redistricting. Carson et al. (2007: 878) find that "redistricting is one among many factors that produce party polarization." Their method examines the ideology of members elected from congressional districts that changed substantially following a redistricting. They find that these districts tend to be more extreme than others in their partisanship, and that members elected from these districts also tend to be more ideologically extreme. Using a similar approach to examine congressional districts that were changed by redistricting, Hayes, Hibbing, and Sulkin (2010) also find members’ behavior is responsive to districts’ change in terms of how they co-sponsor bills when their district becomes more competitive and how they vote in specific issue domains that may be of importance to certain constituents, such as rural constituents and farm policies. Members may modify their behavior in anticipation of constituency change wrought by redistricting (Boatright 2004), although it may
take several election cycles for members to fully adjust to their new constituencies (Stratmann 2000).

Yet, there are limits to redistricting effects. Carson et al. (2007: 889) find that only 60 percent (or 261 of 435) of district boundaries substantially changed from the beginning to the end of the entire time span from 1962 to 2002. Others are more sanguine on the contribution of redistricting to polarization. McCarty, Poole, and Rosenthal (2009) argue that Carson et al. (2007) overstate redistricting effects since districts undergoing change are those found in the most polarized states.

McCarty et al. (2009: 667) examine two causes of polarization: the average distance between the ideologies of the two political parties (i.e., party divergence) and the congruence of ideology and district partisanship. They call the latter “sorting” in how members may be arrayed along the continuum of district partisanship; in this context, sorting invokes the concept that members of the two political parties may be increasingly elected from districts more congruent with their party affiliation. The authors conclude from examination of detrended sorting effects across a redistricting that redistricting “can account for, at most, 10–15% of

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6 It is also true that larger states are where more districts change vis-à-vis apportionment, and where voters can be most segregated in ways that would contribute to polarization.
polarization since the 1970s. These authors assert more forcibly in the popular press that “gerrymandering has nothing to do with political polarization.”

McCarty, Poole, and Rosenthal (2009: 672) set a high bar for redistricting to affect members’ ideologies, in that members’ behavior must have a “sharp increase” immediately following a redistricting, even though members may adjust their behavior prior to a redistricting (Boatright 2004) or gradually adjust their behavior over several election cycles after a redistricting (Stratmann 2000). Furthermore, McCarty et al.’s model is static. Redistricting may be used to shore up an incumbent mismatched with his or her district (Jacobson 2003), such that district constituencies are made to better match members’ ideologies, particularly members of a party who represent districts that lean toward the other party as these are generally the most moderate of all incumbents (see Figure 1). Carson et al. (2007) directly explore this effect, while McCarty et al. (2009) infer it between changes in their estimated effects from one Congress to the next. A static model also cannot

7 Elsewhere, McCarty, Poole, and Rosenthal (2009: 673) say that redistricting accounts for “less than 25% of the increase in polarization since 1973.” Using their figures presented in Table 2 (p. 673), we calculate the effect from their OLS model to be 25.1 percent and 19.4 percent from their matching method. The 10–15 percent figure appears to be a detrended estimate that assumes a uniform increase in polarization in Congresses seated between 1973 and 2003. Their unspecified detrending method may wash out a curious feature of their estimates, that polarization due to sorting declines prior to a redistricting (consistent with Boatright 2004) and then increases sharply in all but one of six of their estimates.

measure other potential changes. If the conditional party government model (Rohde 1991) holds for how realignment contributed to elite polarization, vis-à-vis an increasingly homogeneous party caucus willing to give more powerful tools for leaders to enforce party discipline, then it stands to reason the reverse is true, too: making districts more competitive would lead to a more heterogeneous party caucus and a weakening of leaders’ powers.

While these studies find redistricting affects elite polarization to varying degrees, some authors suggest that creating more competitive districts could, to the contrary, increase polarization. In the presence of competition, candidates must rely more heavily on party support, and thus may be more responsive to party leaders who demand party divergence. Cox and Katz (2002) note that incumbency advantage increased following the reapportionment revolution in the 1960s, when districts initially became less competitive. Engstrom (2013) notes that elite polarization has historically been higher when districts were more competitive. However, McDonald (1999) notes that the causal arrow may be reversed, that when voters polarize, an optimal gerrymandering strategy to take advantage of a less volatile electorate is to draw districts that only appear more competitive.

Can Redistricting Be Reformed to Reduce Polarization?

The preceding discussion primarily involves observational studies of the factors that drive elite polarization. If redistricting can affect district partisanship, then to what
degree can redistricting reform lead to a greater number of competitive districts
and a reduction in ideological polarization? This question can be answered through
two methods. First, observational studies of states that adopt alternative
redistricting institutions – particularly commissions, which are the preferred reform
model (McDonald 2007) – reveal redistricting intervention effects. Second,
alternative mapping by computer simulation or by humans reveals how alternative
maps range across quantifiable measures such as compactness and district
competitiveness.

Observational studies tend to find no measurable effect of redistricting
institutions on polarization. Abramowitz et al. (2006) find redistricting commission
states do not have a greater number of competitive districts. Ryan and Lyons (2014)
similarly find commission states do not have a greater number of competitive
districts – what they call “bipartisan districts” – or reduced elite polarization.
the Citizens Redistricting Commission nor the top-two primary has halted the
continuing partisan polarization of California’s elected lawmakers or their drift
away from the average voter in each district. If anything, polarization has increased
and the quality of representation has declined.”

A general problem with these analyses is that they do not deeply consider the
causal mechanisms linking redistricting commissions’ rules and membership to
more competitive districts or moderation of elite polarization. Only two states,
Arizona and Washington, explicitly have a redistricting criterion to draw
competitive districts (McDonald 2007). California’s commission is not required to
draw competitive districts, so the theory is underdeveloped as to why the state’s newly enacted citizen commission would reduce polarization. Likewise, Abramowitz et al. (2006) and Ryan and Lyons (2014) paint all commissions with a broad brush. We are not surprised that commissions are indistinguishable from legislatures if classification of commissions includes predominantly partisan or bipartisan commissions that may be politically motivated to draw partisan or bipartisan gerrymanders, both that theoretically should result in no uncompetitive districts (Owen and Grofman 1988).

Simulations help developing counterfactuals as to what outcomes are feasible within a state. The range of outcomes is profoundly affected by states’ geographies. Idaho’s bipartisan commission simply cannot draw one of the state’s two congressional districts to be Democratic leaning or competitive, whereas Arizona’s commission has more opportunities to draw both, by virtue of its larger size and more balanced partisanship, but is uniquely constrained by Latino voting rights concerns and other state constitutional redistricting criteria (McDonald 2006b). Observational studies by design treat states as equal cases, and scholars can offer only crude covariates at best to control for states’ differing characteristics.

An alternative assessment methodology is to simulate what may happen within a state through alternative mapping. This approach has been used with human mappers to examine motives of the 1990s North Carolina redistricting (Gronke and Wilson 1999), to forecast the effects of California’s 2000s redistricting reform (Johnson et al. 2005), to examine changing the rank-ordering of Arizona’s criteria (McDonald 2006b), and to explore the use of alternative criteria in five
Midwestern states (McDonald 2009), Virginia (Altman and McDonald 2013), Florida (Altman and McDonald 2014a), and Ohio (Altman and McDonald 2014c). Scholars have also used automated methods to explore the range of potential redistricting plans. Automation was first proposed by Vickery (1961) and has been used to explore alternatives in four states in the 1960s (Nagel 1965), to probe racial gerrymandering intent in South Carolina (Cirincione, Darling, and O’Rourke 2000), to probe nationally the limits of creating competitive districts in the 2000s (McCarty, Poole, and Rosenthal 2009), and to probe through a case study of Florida’s geographical constraints on partisan gerrymandering (Chen and Rodden 2014).

We created the first open-source automated redistricting algorithm, called BARD (Altman and McDonald 2011). Through our experience with automation, we came to a similar conclusion as Nagel (1965: 899): that automated algorithms are “useful for testing some policy proposals” by revealing alternatives for consideration. However, automated algorithms are deeply challenged by the well-established theoretical limits of integer optimization – what redistricting is in the abstract – and are susceptible to subtle implementation biases (Altman and McDonald 2010). In a nutshell, redistricting optimization algorithms are not guaranteed in a modest-sized state to find the global optimum of a scoring function (i.e., criteria) in a finite time. Because there are practically an infinite number of local optima, these algorithms tend to become trapped in local optima and are thus
biased in unknown ways. Alternative redistricting plans drawn by computers or humans can illuminate trade-offs among redistricting criteria, but the absence of a redistricting plan with a given scoring profile does not mean that a plan, or a host of similar plans, does not exist.

Some implementation issues arise out of simplifications that researchers make to their data. For example, McCarty, Poole, and Rosenthal (2009) employ a simulation approach to explore how geography constrains the number of competitive districts. These scholars draw districts out of counties. However, the largest counties in the United States can entirely contain several congressional districts. To address this issue, these scholars subdivide large counties into 1,000 person blocks, and “assume that each of these county blocks is identical” in terms of their political composition to the county (McCarty et al. 2009: 674). Thus, 9,546 identical blocks are created for Los Angeles County, where Obama won 70.6 percent of the two-party vote in 2008. McCarty et al. (2009: 674) assert without proof that this “homogeneity assumption biases towards finding a gerrymandering effect” because the simulation algorithm is unlikely to “produce either very conservative or very liberal districts” (2009: 675). This seems odd to us: the algorithm will produce roughly 13 Los Angeles County congressional districts; all will have exactly the same 70.6 percent Obama vote share. Similar patterns will be observed in other large counties that have two or more congressional districts. McCarty et al.’s (2009) data

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9 This is true when implementing algorithms to meet all U.S. legal redistricting criteria. An automated algorithm does exist to create equal population, contiguous, and compact (with a specific compactness scoring mechanism) (Olson 2010).
assumption is further at odds with the big sort thesis that Democrats gerrymander themselves by predominantly living in large counties (Bishop and Cushing 2009; Chen and Rodden 2014). To the contrary, McCarty et al.’s (2009) county homogeneity assumption biases against finding a gerrymandering effect.

Since redistricting algorithms may have subtle biases that affect conclusions, we wish to explore whether humans can draw plans that explore a broader range of outcomes across criteria of substantive interest, such as the number of competitive districts and compactness. Whereas humans may draw maps with biases, our intuition is that humans will begin their mapping from various starting points and employ complex heuristics that help them avoid trapping themselves in local optima, whereas the simple heuristics employed thus far research cannot. An observation of Mexico’s experience with automated redistricting demonstrates humans are capable of beating a simulated annealing optimization algorithm (Altman et al. 2014). Working with our software development partner Azavea, we developed open-source web-accessible redistricting software called DistrictBuilder, which we deployed in several states to support advocates’ efforts (Altman and McDonald 2014b). Florida’s legislature developed a similar online tool to enable greater public participation. We present the results from three studies to date on Florida (Altman and McDonald 2014a), Ohio (Altman and McDonald 2014c), and Virginia (Altman and McDonald 2013).

In Figure 4 we plot all legal redistricting plans that were publicly available in Florida, Ohio, and Virginia. We define legal plans as those where all geography is assigned to the correct number of congressional districts, that these districts have a
population deviation of plus or minus 1.0 percent from the ideal equi-populous district (many plans have districts that deviate by one person), and there is a minimum number of minority-majority districts.\footnote{10} Publicly available redistricting plans are those either made available by the state legislature or developed through advocates’ redistricting competitions that we supported. We plot the average compactness of districting plans along the horizontal axis, such that more compact districts have higher values,\footnote{11} and the number of competitive districts in the tighter plus or minus four percentage point range, using the 2008 two-party presidential vote, normalized to the candidates’ national vote shares. We disaggregate precinct level presidential vote to the census block level to construct our statistics. This approach replaces McCarty, Poole, and Rosenthal’s (2009) county-level homogeneity assumption with a precinct level homogeneity assumption (a much smaller unit of aggregation), as is consultants’ typical practice when constructing redistricting databases (McDonald 2014). We identify the adopted plan with a red triangle; all other plans are identified by blue diamonds.

\textbf{Figure 4} reveals that it is possible to create more competitive districts without sacrificing compactness in Florida, Ohio, and Virginia; indeed, the plan with the most competitive districts – and many other plans with a greater number of

\footnote{10} We analyze plans with at least three majority-minority districts in Florida and one in both Ohio and Virginia.

\footnote{11} We use the Schwartzburg compactness measure. We normalize the values since the varying geography of these states does not make comparisons of scores across states meaningful.
competitive districts – is more compact than the adopted plan.\textsuperscript{12} In Florida, the adopted plan has one competitive congressional district out of 27, while a plan exists with eight competitive districts. In Ohio, the adopted plan has zero competitive districts out of 16, while the plan exists with eight competitive districts. In Virginia, the adopted plan has two competitive districts out of eleven while a plan exists with three competitive districts. In all, the adopted plans have a total of three competitive districts out of 55, while plans with the maximum number of competitive districts have a combined 21 competitive districts. We do not know if it is possible to draw more competitive districts since those drawing plans may not have been trying to maximize district competitiveness; indeed, in Ohio and Virginia, many non-legislative map drawers participated in competitions where competitive districts were one criterion among others.

Figure 4 Competitive Districts and Compactness; All Florida, Ohio, and Virginia Publicly Available Legal Redistricting Plans

\textsuperscript{12} This is true for other criteria such as respect for political boundaries and partisan fairness; for space considerations, we do not present scatter plots of these other criteria (Altman and McDonald 2013; 2014a; 2014b).
Number of Competitive Districts

Compactness
Discussion: Can Redistricting Reform Solve Polarization?

Our analysis of alternative legal redistricting plans that include minority voting rights districts reveals that, compared to the adopted plans that have one competitive district out of 55, at least 21 competitive districts can be drawn in Florida, Ohio, and Virginia. McCarty, Poole, and Rosenthal (2009: 678), employing simulations with contiguity and compactness constraints, find that 80 competitive districts are possible nationwide (although the authors do not define their measurement of a competitive district). We cannot fully reconcile these two analyses since McCarty, Poole, and Rosenthal examine the entire country and our scope covers only three of the most closely contested battleground states. Furthermore, we do not believe that one should simply extrapolate our findings to all states; for example, there are clearly small uncompetitive states with one or two districts where redistricting can have little or no effect. Still, we believe that the opportunities for competitive districts, and a reduction in elite polarization, may be greater than the McCarty et al. analysis indicates.

Where we agree with McCarty, Poole, and Rosenthal (2009) is that not all congressional districts, and likely not even a majority, can be made competitive, and that redistricting is but one piece of a greater polarization puzzle. Further, even where districts could be made competitive, whether redistricting reform efforts
leads to competitive districts depends on the manner in which the reform is implemented. Contrast the implementation of redistricting reform in California with the implementation of reform in Arizona.

As Kousser, Phillips, and Shor (2014) discuss, California’s reform effort is likely to create competitive districts and to affect polarization only by happenstance. California has no explicit requirement for competitive districts, and the commission adopted only three congressional districts with a 2008 Obama two-party vote share between 48 percent and 52 percent. In contrast, in Arizona, the commission is explicitly tasked by the state constitution to draw competitive districts. Arizona’s commission produced three congressional districts out of nine, which is a seemingly difficult task when also drawing two heavily Democratic Latino districts in this Republican leaning state (McDonald 2006b). Lumping Arizona and California under the same rubric of redistricting commissions is, perhaps, why scholars find these different institutions have no effect on district competition (Abramowitz, Alexander, and Gunning 2006; Ryan and Lyons 2014). (Similarly, Ohio advocates’ redistricting competition balanced district competition against other criteria to a positive effect on district competition. See Figure 4 and Altman and McDonald 2014c). If reformers wish to affect a political outcome, we recommend explicitly incorporating the intended outcome into the redistricting criteria.

Our analysis differs from some others such as McCarty, Poole, and Rosenthal (2009) in finding that redistricting reform can have a substantive effect on polarization. Redistricting is among the few inputs to elite polarization that are both measurable and readily subject to policy intervention. We believe redistricting
institutions can be developed to proactively increase the number of competitive districts and thus reduce elite polarization.

It is possible that redistricting reform to increase competitive districts may have second-order effects beyond the direct effects of electing more moderate members. These secondary effects could act in the opposite direction; we note that increased district competition is historically correlated with greater ideological polarization (Engstrom 2013). However, we judge (following Engstrom) that historical correlation is a result of strong and polarized parties using biased districts with thin margins in attempt to maximize partisan advantage – and not a result of competitive districts causing polarization (McDonald 1999). Moreover, there are theoretical reasons to believe that the secondary effects will further decrease polarization. For example, if the conditional party model of government is correct (Rohde 1991), injecting the House of Representatives with more moderates will empower them to constrain the power of party leaders to enforce party discipline, which is among the primary drivers of elite polarization through party divergence. Based on the current evidence, we conjecture that the secondary effects will be neutral or positive – but note that these effects have yet to be systematically measured in the literature.

We recognize that there are many other reasons to embrace redistricting reform and competitive districts. With specific regards to competitive districts, they provide general election voters with the opportunity to hold members accountable as their districts are not so electorally safe, and it likewise allows voters to hold parties accountable as their majorities may be at risk. Members who represent
competitive districts may not draw strong challengers if they represent their districts well (by being ideologically moderate); however, it is possible that a greater number of competitive districts can lead to a greater number of competitive elections, and higher associated campaign costs. Likewise, competitive elections may result in a greater number of voters being unhappy about the winner (Brunell 2008). We are reminded that any electoral reform is inherently a balance of competing values (Arrow 1951). Properly designed redistricting institutions may ameliorate elite polarization, although the effect may not be as large as advocates hope. As with all reforms, there may be unanticipated consequences. Still, if one is concerned about elite polarization, redistricting should be a reform option on the table.

References


