Partisan Gerrymandering*

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1 Introduction

Legislative bodies drawing maps for themselves in decennial redistricting has long been the norm in the U.S., whereas non-partisan districting mechanisms are the norm in most other countries (Butler and Cain, 1992). Moreover, each state has responsibility for drawing the congressional districts in the state and there is no national redistricting process. However, federal law requirements, especially the Voting Rights Act of 1965 as amended in 2006 and rules about "one person, one vote," affect what legislative and congressional maps are regarded as lawful, and provisions of state law can also be important.

Although there is generally judicial deference to actions seen as falling into the domain of legislative responsibility, courts can and do strike down plans that violate the law. Despite some recent changes in the role of the federal government in monitoring redistricting issues involving race[1], federal courts may strike down plans if protected racial or ethnic groups are found to have their vote diluted or when race is found to be a dominant motive in the map-making.[2] Although partisan consequences are often at the forefront of the considerations shaping U.S. redistricting outcomes, federal court action to constrain partisan gerrymandering has been scarce to nonexistent.[3] Partisan gerrymandering, especially since the 2010 round of redistricting, has been egregious.[4]

Despite the Supreme Court ruling in *Bandemer v. Davis* (1986) that partisan gerrymandering could in principle violate the U.S. Constitution, in the 30+ years since *Bandemer*, no plan was ever held to be an unconstitutional partisan gerrymander. Nonetheless,

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[1] See especially *Shelby County v. Holder*, 570 US 529 (2013).

[2] Several states have recently passed their own state level versions of the VRA, which has created a new role for state courts in monitoring racial gerrymandering claims (Greenwood and Stephanopoulos, forthcoming).

[3] And, importantly, became no longer possible in federal court after the U.S. Supreme Court determined that partisan gerrymandering claims were not judiciable in federal court. *See Rucho v. Common Cause*, 139 S. Ct. 2484 (2019).

[4] See *Sam Wang, The Great Gerrymander of 2012*, New York Times, Feb. 2, 2013, https://www.nytimes. com/2013/02/03/opinion/sunday/the-great-gerrymander-of-2012.html

until 2019, the Supreme Court left open the possibility that a standard for adjudicating partisan gerrymandering claims might be found (see discussion in Grofman and King, 2006), and social scientists and litigants continued to press claims and suggest new tests. In *Rucho*, after two lower courts had found challenged plans to be unconstitutional partisan gerrymanders, the U.S. Supreme Court majority put to rest the idea that federal courts will play any role in policing partisan gerrymandering. The Court majority asserted that social science testimony about metrics for assessing the magnitude of partisan gerrymandering and claims that the identified partisan gerrymandering would have durable effects led to tests that were simply not judicially manageable.

This abdication of responsibility for partisan gerrymandering claims by the federal courts has left two directions to pursue to confront the problems of egregious partisan gerrymandering that can deny the voters of a state a realistic opportunity to change partisan control in their state legislature or in their congressional delegation. One approach to the problems posed by partisan gerrymandering has been to remove redistricting authority from state legislatures and place it in the hands of some form of commission. The other approach has been to turn to state courts.

As of November 2022, 34 state legislatures draw their own lines, and 39 legislatures draw the lines for congressional districts (All About Redistricting). Nine states have independent commissions with primary authority for congressional redistricting[5] and four have advisory commissions that require legislative approval before a plan can go into law.[6] Legislative districting is no longer under complete legislative control in fourteen states (Rakich, 2022). Many of these commissions have been created during the past decade via an initiative process that exists in 24 states. The commissions vary considerably in their structure. In some commissions, members are chosen by political leaders. Commissions sometimes include elected officials while other commission prohibit office-holders from membership. In some commissions there is a tie-breaker appointed either by agreement of the partisan members of the commission or, failing that, by a state court. Of course, when commission members are chosen by politicians (or actually are politicians) they may act like politicians (or even report to politicians in secret).

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[5] Alaska (currently only one district), Arizona, California, Colorado, Idaho, Michigan, Montana, New York, and Washington (All About Redistricting).

[6] Iowa, Maine, Utah, and Vermont (All About Redistricting).

Also, because of the appointment rules, some ostensibly bi-partisan commissions are really effectively under the control of the majority party in the state. Moreover, some commissions have rules that are highly likely to lead to failure to reach an agreement on a map due to partisan deadlock. Other commissions are purely advisory and final discretion rest with the state legislature.

The impotence of federal courts as checks on partisan gerrymandering has made state courts the only feasible locus for judicial intervention (Elmendorf, 2018; Cervas and Grofman 2019). One way for this to happen is to add language to the state constitution that will give state courts the potential to directly address partisan gerrymandering claims. Beginning with Florida (in 2010), states have added language to ban mapmaking such as prohibiting a map that "unduly favors or disfavors any political party." Such language is now found, for example, in the state constitutions of California, Colorado, Delaware, Hawaii, Iowa, Michigan, Minnesota, Montana, Nebraska, New York, Ohio, Oregon, Utah, Virginia, and Washington. But in Ohio, the state court is forbidden from drawing a remedial map of its own, which led in the 2020 redistricting round to a deadlock involving rejections by the state court of every proposed plan, ultimately forcing federal court intervention to choose a plan for use in 2022.

Another possibility is to bring partisan gerrymandering challenges in state court with the hope that the highest judicial authority in the state will find existing language in the state constitution that allows then to regulate partisan gerrymandering., e.g., reinterpreting language about the need for elections to be "free and equal" or "free and open." This language, or something very similar, is found in seventeen state constitutions (National Conference of State Legislatures) and has now been used by more than half a dozen state courts as a justification for regulating gerrymandering under state law, beginning with a decision by the Pennsylvania Supreme Court in 2019. *League of Women Voters of Pa. v. Commonwealth*, 178 A.3d 737 (Pa. 2018).

2 Approaches to conceptualizing partisan gerrymandering

State courts that have chosen to rein in gerrymandering have not agreed as to how partisan gerrymandering is to be defined and measured. We can think of possible approaches in terms of choosing which one or more of the following four questions must be addressed.

(1) “Does the map, as a whole, substantially violate traditional “good government” districting criteria such as preserving county and city boundaries or creating compact districts?”

Sometimes this is done simply by comparing the enacted map to proposed alternatives. But also, in recent litigation, the degree to which a map is an outlier has been examined in the context of simulations in which a large set of maps (often referred to as an “ensemble”) is computer drawn based on the actual geography of the state. The computer is given instructions to combine precincts to create contiguous districts of equal population, and goals such as minimizing county splits and taking measures of compactness into account. In terms of the least compact maps in the ensemble, or the maps with the greatest number of county splits, actual or proposed maps that exhibit values that are at the extreme tail of the ensemble distribution (say in the bottom 2.5%) are taken to violate the constitution.[7]

(2) “Is there evidence that particular district lines violate good government standards?

Here, rather than looking at the jurisdiction as a whole, the focus shifts to the district level, examining how particular districts were drawn or redrawn as compared to an old map that had previously been accepted as a constitutional one, e.g., the strange shapes of some districts, their unnecessary fragmentation of municipalities, and the absence of justifications for the shapes in terms of communities of interest.

While these first two indicia of a possible violation of state law focus on the geographic features of the map as a whole or of districts in it, the alternative is to rely on explicitly political measures. This approach gives rise to another two key questions, one in terms of intent and one in terms of effects.

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[7] Another way to think about county and city splits is in terms of what we have referred to as the *N-1 rule*. It can be shown that. except for knife-edge results, it is always possible to create a map with no more than N-1 county splits (or N-1 city splits) where N is the number of legislative districts, though sometimes fewer splits are possible (Cervas and Grofman, 2020; Nagle, 2022).

(3) "Is there evidence of that particular district lines were intentionally manipulated for partisan purposes in a way that lack compelling justification in terms of politically neutral standards?"

Intent can be inferred from an analysis of the process which led to the map's adoption (including the degree of partisan divisions in the map's adoption, and the openness of the process), or based on actual statements of the mapmakers as to their goals. Intent can also be inferred indirectly by examining the partisan features of the map and its effects. Ensembles are particularly useful to demonstrating *intent* because a computer programmer can deny the algorithm information about partisanship (or race), and then an enacted or proposed plan can be compared to the distribution of resulting plans in the ensemble. While ensembles cannot alone prove intention, they can provide powerful circumstantial evidence.

(4) "Has one political party and its voters and candidates been unconstitutionally discriminated against in terms of its ability to translate votes into seats?"

Even though most of the public focus on redistricting is simply in terms of projected partisan outcomes ("elections as horseraces"), virtually all social scientists, going as far back as Dahl (1956; but see especially Tufte, 1973; Grofman, 1983; Gelman and King, 1987; Grofman and King, 2006) view partisan gerrymandering in terms of expectations about the degree of *symmetry* in the translation of each party's votes into seats. In light of this approach, legal challenges to maps have looked at partisan gerrymandering not simply in terms of which party can be expected to win a majority of the seats in a legislature or congressional delegation, and by what seat margin, but also by looking at metrics intended to measure if both parties are able to receive the same seat shares were they, hypothetically, to have received that same vote share.

At the statewide level, there are several metrics based on considerations of symmetry that have been used to assess whether the map should be regarded as a partisan gerrymander and to evaluate the level of partisan vote dilution. Here we focus on the three most commonly reported: (a) *partisan bias*, (b) the *mean minus median gap*, and (c) the *efficiency gap*.[8] Also, importantly,

[8] A fourth metric, *Declination*, is a recently proposed measure of gerrymandering offered in Warrington (2018).

(d) analyses of partisan gerrymandering effects have been done using *computer generated ensembles*, i.e., sets of potential maps satisfying various criteria.

(a) Partisan Bias is a metric used to assess asymmetry in the translation of each party's votes into seats. We may think of partisan bias as having two driving forces in terms of asymmetry: (a) the degree to which one party has had it votes "packed" into "too few" districts relative to its electoral support overall and (b) the degree to which districts that are reasonably competitive have been drawn in a fashion that favors that party, i.e., the degree to which the party not in control of the redistricting has had its voting strength "cracked."

To estimate partisan bias we can generate what is called a *seats-vote curve*. In its simplest deterministic version (Tufte, 1973), hypothetical elections are constructed from a set of actual (or projected) election outcomes by incrementally adding (or subtracting) one percentage point (on average) at a time (the assumption of *uniform swing*) to find aggregate seat outcomes under differing mean vote shares. This curve is, essentially, always non-linear in form (cf. Grofman, 1982). Gelman and King (1994) developed the stochastic form of estimation of seats-votes curves that is now standard. They introduce a random error term with mean zero and simulate multiple elections -- with the error variance of a magnitude comparable what has historically been observed. Their approach also allows for covariates (such as incumbency) to be introduced into a regression equation that might be used for predictive purposes. This approach is implemented in a computer program, *JudgeIt*.

Partisan bias in terms of votes (a.k.a. *votes bias*) is measured at the (hypothetical) point where each party's share of the two-party vote is exactly 50%. At that point, both parties should, by symmetry, receive identical seats shares. Thus, the difference between a party's projected seat-share with 50% of the vote and a seat share of exactly 50% can be taken as a measure of asymmetry in the translation of votes into seats. (see Grofman, 1983 for discussion of variants of this approach)[9]

[9] Alternatively, we can look at *seats bias*, which is the difference between the vote share obtained when the seat share is 50% and a 50% vote share. The two are mathematically related.

(b) The *Mean-Median Gap* is the difference between the average vote percentage for a party and its vote share in the median district when districts are sorted according to two-party vote share (McDonald and Best, 2015).

This metric is easily understood and does not require computer-based simulations or counterfactuals, and it is clearly relevant to any situation where control of the median seat translates to control of the legislative agenda. It can be thought of an approximation to the more familiar *skewness* measure from statistics. When the mean is substantially higher or lower than the median, this fact is taken to be indicative of partisan bias, with the mean higher than the median taken to be evidence that the map is biased against the party for which this true. The basic idea is that the median district should reflect the state's overall partisan environment. Moreover, if the mean and the median are the same, then we might expect that electoral tides would shift the median district to reflect those tides.

However, because the *mean minus median* gap is calculated at a single point, and as statisticians emphasize, no single statistic fully captures an overall distribution, this metric may be misleading, especially when the number of districts is small. What happens to seat share when there are electoral tides depends on the overall degree of political competition and the overall degree of political bias in the map in the potentially competitive seats.

(c) The *Efficiency Gap (EG)*, proposed by McGhee (2014*; see also* Stephanopoulos and McGhee, 2014), is a function of the degree to which each party's votes are *wasted*, where all of a party's votes are counted as wasted if the party loses the district, and all the winner's votes over 50% are counted as wasted. The difference between each party's wasted votes is then divided by the total votes, with a value of zero for this ratio denoting what is regarded as the ideal.

However, while the EG is defined in terms of one definition of what constitutes a *wasted vote*, as noted in Best et al. (2018, p. 13), treating an EG value of zero as ideal is equivalent to taking an aggregate responsiveness (*swing ratio*) of two as ideal. But there is no compelling jurisprudential reason to make a responsiveness level of two as ideal. Indeed, the responsive value for a perfect proportional system is 1, so that a purely proportional system would show up as somewhat biased according to the *efficiency gap* metric. And because seats-votes curves are empirically non-linear, vote shares far from 50% may deviate substantially from a responsiveness of 2.

Perhaps the key problem with the EG metric is that it is exceedingly sensitive to narrow wins or losses. Consider a district where, say, the average Democratic candidate will receive 49,000 votes to the Republicans' 51,000 votes. That district will typically produce 49,000 wasted Democratic votes to the Republicans' 2,000 wasted votes and will contribute to a large Democratic *efficiency gap*. Suppose, however, that the Democrats produce an unusually strong candidate, or that a given year is an unusually good Democratic year, and the Democrat is able to persuade 2,000 voters previously supporting the Republican candidate. Now the district will produce 2,000 wasted Democratic votes to the Republicans' 49,000 wasted votes, which can shift the EG considerably, especially if the legislature or congressional delegation is not that large. Another way, however, to think about the *efficiency gap* is that it is not actually a measure of bias, but rather it measures the degree of responsiveness of changes in seats to changes in votes. It can thus best be regarded as a preliminary way to assess whether whatever partisan gerrymandering might be present should be seen as *de minimis* from the standpoint of assessing a constitutional violation.[10]

(d), A computer-generated ensemble can be used to create plans which are said to be drawn from the universe of all potential plans. Then the expected partisan outcomes in the challenged map, or metrics such as those above, can be directly compared to those in the ensemble. We can also sort the districts in each plan with respect to partisanship to obtain distributions of the expected results in the k^{th} most Democratic district in the ensembles set of plans, and then compare those results with the corresponding districts in some proposed map to see if there is evidence for either cracking or packing.

There is, however, a major problem if the ensemble approach is used blindly. In most states the electoral geography of the state creates a bias against the Democrats because their votes tend to be disproportionately concentrated in urban areas, and thus tend to get disproportionately wasted when district boundaries are drawn respecting cities (see e.g., Chen and Rodden 2013; Rodden, 2019; Eubanks and Rodden, 2020). For example, if districts are drawn wholly within, say, Philadelphia or the Manhattan portion of New York City, it is virtually

[10] Moreover, as its creator noted, the efficiency gap is a measure, not a test (McGhee, 2017).

impossible not to draw districts with 80% or more Democratic vote share. Because of geographic constraints built into ensemble programs, the central tendency of an ensemble might be one that substantially favors one party or one that dilutes minority votes. Thus, there is a potential serious conflict between the ensemble approach and the approach using metrics of the sort discussed immediately above.

3 Further Complexities

We have previously identified two complexities that need to be considered: (a) the applicability of metrics of symmetry to situations where the approach requires us to estimate hypothetical outcomes that are electorally infeasible, and (b) conflict between notions of partisan gerrymandering that use as their baseline the electoral geography of the political unit to be considered and ones based on metrics that have a zero-bias point based on the structure of the seats-votes curve. The former problem has been dealt with in different ways, with one approach being to consider mean bias at the points on the seats-votes curve that are electorally realistic; the latter problem has been dealt with by privileging one or the other approach (Katz, King, and Rosenblatt, 2020). More generally, (c) not all approaches may give us the same answer. One answer to the question of how to resolve the problem with multiple metrics and no single measure treated as a compelling metric is to take the view that a plan that is found to be a gerrymander on multiple measures is almost certainly a gerrymander. Many metrics tend to be highly correlated with one another. A second possible solution is to say that different metrics answer somewhat different questions, e.g., *partisan bias* measures asymmetry at the hypothetical point where one party has a 50% vote (or seat) share, and the *mean minus median gap* measures asymmetry at the actual observed vote share or at a projected vote share based on the history of recent past elections. Another solution is to turn to more direct measures of geographic manipulation.

But there is one issue that cannot be avoided, namely (d) how to assess when a given level of partisan gerrymandering rises to the level of a constitutional violation. That is not at all an easy question. For example, based on cross-state comparisons of past efficiency gap scores, plaintiffs claiming unconstitutional partisan gerrymandering have proposed efficiency gap thresholds of 7%, 7.5%, and 12.5%, as providing evidence of potential unconstitutionality. But,

even for specialists, it is not clear how to interpret a particular value of the EG metric. And it does not seem that this measure lends itself well to a bright line test.

Many reformers and courts have coalesced on the premise that traditional good government criteria can reign in the worst offenses of gerrymandering. But plans can still exhibit "stealth gerrymandering" (Cervas and Grofman, 2020), i.e., a plan that satisfies traditional criteria but still acts to severely dilute the votes of one party. Is it *sufficient* to satisfy traditional geographic redistricting criteria when drawing a plan, or must a plan minimize partisan bias in outcome? Further complicating matters is the fact that it may not be possible to create plans that reduce bias to zero on one or more metrics of partisan gerrymandering due to the differential electoral concentrations of partisan support for the two parties, or the traditional requirements that county and city lines be honored and that districts be reasonably compact. No two states are alike in their electoral geography. Ultimately, the degree of concentration of partisans, and the degree of partisan preponderance will determine how difficult it is to draw non-dilutive but compact districts. Also the number of districts in the given political entity is relevant to how easy it is to draw non-dilutive plans.

Addressing the legal issue of relevant thresholds for the various approaches discussed above is beyond the scope of this essay. We refer to Cervas, Grofman, and Matsusada, (2023) for a preliminary discussion of how state courts have addressed this question prior to the November 2022 elections.

4. Looking to the Future

While the 2010 round of redistricting might have been the worse for creating advantages for a party since the pre-1962 "silent" gerrymander period, the 2020 round is arguably even worse with respect to the prevalence and extent of partisan gerrymandering in terms of the maps initially drawn. However, thanks to recent institutional reform and the persistence of reformers in bringing challenges in state courts, the overall level of partisan gerrymandering in the 2022 election was considerably reduced (Kenny et al, 2023). Nonetheless, today in the United States, egregious partisanship in districting remains an anti-democratic scourge. Moreover, when partisan gerrymandering is coupled with trifecta control of a state's politics, and the increased

politicization of statewide judicial offices, and efforts to limit voting for disfavored groups, the prospects for a genuine democratic breakdown at the state level are non-trivial (Grofman, 2022).

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