

## A Discernable and Manageable Standard for Partisan Gerrymandering

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Paper submitted to the Common Cause “Gerrymander Standards” Writing Competition

### Abstract

The case of *Veith v. Jubelirer* (2004) challenges us to find a standard for partisan gerrymandering that is judicially discernable and manageable. Without such a standard even the most egregious partisan gerrymanders cannot be effectively challenged. However, we argue that the way to find a suitable standard is not to embark on a quest for a “new” standard. Rather it is to take the existing valid measures that science gives us, and show that these can be grounded in constitutionally protected rights. Using recent results in social choice theory, we show that the existing partisan symmetry standard can be derived from an individual right to equal protection. We also show that the existing technology for measuring partisan symmetry can provide a judicially manageable test for partisan bias.

## I. Introduction

The Supreme Court's decision in *Vieth v. Jubelirer* (2004) challenges us to find a viable standard for judging political gerrymandering cases. Although the Court did not come to any joint opinion, a majority of Justices indicated that there was currently no viable judicial standard for judging partisan gerrymandering cases. Justice Scalia, joined by three other Justices, argued that no such standard could exist in principle and that partisan gerrymandering was a non-justiciable "political question". Justice Kennedy argued that no standard currently existed, but that one might in principle be found. As a result, until the Court is convinced that a suitable standard has been found, there is no possibility of a partisan gerrymandering case succeeding. This means that in practice (though not in principle) partisan districting is a non-justiciable political question. In the districting round following the *Vieth* decision, many states have pursued maximum partisan advantage, as we will see later in this paper.

Given the demand for a standard, it might be tempting to go looking for a new standard for partisan gerrymandering. Such a strategy, however, would be unfortunate. A decision by the Supreme Court may change the law, but it does not change what partisan bias is. What is needed is a correct definition and measure of partisan bias. We will argue that social scientists are quite capable of measuring partisan bias reliably (see King et al. 2006; Grofman and King 2007). Appropriate methodology has been developed, peer-reviewed and implemented, such as the partisan symmetry standard (Gelman and King 1994b). However, what is needed is not simply a *scientific* standard of partisan bias; what is needed is a *legal* standard. It is not enough to show that a districting scheme treats parties differently; it is necessary to show that this represents a violation of the constitutional rights of individual voters. As Justice Kennedy puts in in his

opinion on *LULAC v. Perry* (2006), what is lacking is “a reliable measure of *unconstitutional* partisanship” (italics ours).

The problems that come with trying to invent a new standard, as opposed to making use of the existing science, can be illustrated by considering the new standard recently proposed by Stephanopoulos and McGee (2015). Although the authors claim that this is a measure of the partisan symmetry standard discussed in *LULAC v. Perry* (2006), it is actually something quite different.<sup>1</sup> The new standard they propose is based on what they call the “efficiency gap” – the idea that the number of “wasted votes” for each party should be equal.<sup>2</sup> The problem is that it is not clear how a standard can be linked to any constitutionally protected right, apart from the general fairness argument that the authors make. Furthermore, it is not obvious that each party having an equal absolute number of wasted votes is uniquely fair. It could equally well be argued that parties should waste the same share of their vote – so if one party has twice the votes of the other, it should waste twice as many. Or it could be argued that the parties should waste the same number of votes for every seat they receive. These standards lead to very different results. If a

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<sup>1</sup> The reason the partisan symmetry approach of Gelman and King (see King et al. 2006) was a major advance was that it separates symmetry/bias (whether the districts treat the two parties differently) from responsiveness (how much do the districts advantage the larger party, whoever that may be). The efficiency gap standard, however, once again conflates these two things. Symmetry requires that if the Democrats get a certain number of seats for (say) 60% of the vote, then the Republicans must get the same number if they get 60%. It does not matter if the party with 60% gets seven seats out of ten, as opposed to six or eight, as long as both parties get the same if they attain a 60% vote share. The efficiency gap standard, however, requires that a party must receive an additional 20% of the seats for every 10% of the vote it receives over 50% – if it gets 60% of the vote, it must get 70% of the seats. The problem is that there is no obvious basis – in either law or equity – for demanding this level of responsiveness. In fact there are very good reasons why different states should have different levels of responsiveness – if there are geographical concentrations of partisans or majority-minority districts required by the Voting Rights Act, then there will be some very safe districts that will lead to low responsiveness. This will be misinterpreted by the efficiency gap measure as bias.

<sup>2</sup> A wasted vote is defined as any votes a party receives over 50% in a district it wins, plus any votes it receives in a district it loses.

plaintiff was to argue based on the Stephanopoulos and McGee efficiency gap standard, the defendant could simply reply that there are many equally plausible standards.

Thus there is no need to invent a new definition or measure for partisan bias, as social scientists are already quite capable of defining and measuring this. What is required is to show that the partisan bias we measure represents a violation of a constitutionally protected right. In the plurality opinion on *Vieth v. Jubelirer* (2004), Justice Scalia challenges the existing arguments for the unconstitutionality of political gerrymandering in a fundamental way. The argument that partisan gerrymandering is unconstitutional has been based on the assumption that drawing districts to dilute the influence of a political group violates the Equal Protection Clause of the 14<sup>th</sup> Amendment. Justice Scalia, on the other hand, asserts that it is only individual voters, and not political groups, who have a right to equal treatment under the Equal Protection Clause. If this is so, then the question of whether there is political gerrymandering appears to be constitutionally irrelevant. Justice Scalia's objection appears decisive because the Constitution certainly does not enumerate a right of political groups to equal treatment.

Of course, Justice Scalia was only writing for a plurality of Justices, not for the Court. However, Justice Kennedy – the pivotal fifth Justice in the case – accepted the plurality's analysis of previously proposed standards for partisan gerrymandering. In particular, Justice Kennedy agreed with Justice Scalia's assessment of the plaintiff's proposed standard (that a majority of voters should be able to elect a majority of voters), stating that "There is no authority for this precept" (2004, 308). He also agreed that even if this standard could be constitutionally justified, there was no way to derive a judicially manageable standard from it. Furthermore, he accepted that the plurality had demonstrated "the shortcomings of the other standards that have been considered to date" (2004, 308). Justice Kennedy opinion differs from that of the plurality

in that he does not foreclose the possibility that a viable standard may be found. However, he endorses the plurality's analysis of previously proposed standards. Therefore if Justice Kennedy is to be convinced that a standard is viable, it is absolutely necessary to address the objection made by Justice Scalia for the plurality. We need to show that the standard we propose is both judicially discernable and manageable.

Fortunately we have the tools to address the challenge posed by Justice Scalia. We can show that the majority rule standard can be derived strictly from the equal treatment of individual voters, without relying on any argument about group rights. This provides a response to Justice Scalia's objection. The result is based on recent work in mathematical voting theory published after *Vieth v. Jubelirer* (2004). The consequence of this is that partisan gerrymandering violates individual, and not just group, rights. Thus we can provide a constitutional justification for partisan gerrymandering claims based on Article 1§2 of the Constitution and the Equal Protection Clause of the 14<sup>th</sup> Amendment.

Once we have shown that the majority rule standard can be derived from the Constitution, it is necessary to show that it can yield a judicially manageable standard. We can do this by showing that applying the majority rule standard nationally logically implies partisan symmetry at the state level. There already exists an established, peer-reviewed technology to measure partisan symmetry (Gelman and King 1994b, 1994a, 1990). Indeed this measure was proposed in an amicus brief for *LULAC v. Perry* (2006) and discussed in the judgment to that case. Justice Kennedy did have some reservation about the measure, but we will argue that these can be addressed. Indeed, we can demonstrate the tractability of this measure by calculating it for all states in this paper.

This paper proceeds in three stages. First we show that it is possible to find a judicially discernable standard for partisan gerrymandering. That is, we can derive such a standard from the constitutionally protected rights. We can show that the right to equal protection of individual voters implies the majority rule principle – a majority of voters should be able to elect a majority of representatives. Secondly we show that the majority rule principle logically implies the partisan symmetry standard. We also consider various objections that have been made to it by various Justices. Finally we briefly show how the partisan symmetry standard can be implemented. Thus, instead of embarking on a quixotic quest for a new standard, we can show that an existing, well-proven measure can be grounded in the Constitution.

## **II. A Discernable Standard?**

Let us consider the *majority rule* standard for political gerrymandering proposed by the plaintiffs in *Vieth v. Jubelirer* (2004) – a majority of voters is denied the ability to elect a majority of representatives. If this is to be a viable standard for political gerrymandering, it is necessary to show that it is both judicially discernable and manageable – that is, it can be derived from a constitutionally protected right and can be practically applied. This section considers whether the standard is judicially discernable, while the next considers whether it is manageable.

The claim that partisan gerrymandering violates constitutional rights is derived from the claim that the Constitution guarantees an equal right to vote and to have one's vote counted equally. There are two sources for this claim: Article 1§2 and the Equal Protection Clause of the 14<sup>th</sup> Amendment. The Supreme Court in *Wesberry v. Sanders* (1964a, 7-8) found that “the command of Art. I, 2, that Representatives be chosen ‘by the People of the several States’ means that as nearly as is practicable one man's vote in a congressional election is to be worth as much

as another's." The Court found that this implies that if congressional elections are held by district (as opposed to statewide), then the districts must be of equal size.

In *Reynolds v. Sims* (1964b), the Court found that citizens had a right to have their votes counted equally, based on the Equal Protection Clause of the 14<sup>th</sup> Amendment.<sup>3</sup> The Court found that the right to vote is protected by the Constitution (1964b, 554). Given that refusing to allow someone to vote is a constitutional violation, then so is diluting the value of their vote by other means, such as ballot stuffing or not counting certain votes. If these are constitutional violations, then so is diluting someone's vote by unequally sized districts. The Court (1964b, 555) concludes that "the right of suffrage can be denied by a debasement or dilution of the weight of a citizen's vote just as effectively as by wholly prohibiting the free exercise of the franchise."

The claim that partisan gerrymandering is a constitutional violation is an extension of the claims made in *Wesberry v. Sanders* (1964a) and *Reynolds v. Sims* (1964b). If diluting a person's vote by drawing unequally sized districts violates their right to vote, then surely so does cleverly manipulating the shapes of districts to achieve the same effect. After all, *Reynolds v. Sims* (1964b, 563) finds that the Constitution forbids "sophisticated as well as simple-minded modes of discrimination",<sup>4</sup> and that, "Weighting the votes of citizens differently, *by any method or means*, merely because of where they happen to reside, hardly seems justifiable" (italics ours). However, there has been considerable ambiguity as to how partisan gerrymandering would be treated. As early as 1965, the Supreme Court declared in *Fortson v. Dorsey* (1965) that diluting the vote of a racial or political group could be unconstitutional, even if there was no malapportionment; and in *White v. Regester* (1973) a districting plan was overturned on grounds

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<sup>3</sup> The exception to this is, of course Senate elections, where the Constitution explicitly demands that election be held by State.

<sup>4</sup> Citing *Lane v. Wilson*, 307 U.S. 268, 275

that it was a (racial) gerrymander. Both these cases, however, involved multimember districts. It was not until *Davis v. Bandemer* (1986) that the Court stated unambiguously that partisan gerrymandering could constitute a constitutional violation, even when there were properly apportioned single member districts. The Court found that “the claim is that each political group in a State should have the same chance to elect representatives of its choice as any other political group” could be judiciable under the Equal Protection Clause (1986, 124). However, the Justices were unable to reach a majority position on what the standards for judging what constituted a partisan gerrymander.

In *Vieth v. Jubelirer* (2004) the Supreme Court effectively made claims of partisan gerrymandering non-justiciable, at least until a new standard could be found. The reason given by the five Justices who concurred with the decision was that there did not exist a standard to decide such cases that could be derived from the Constitution and be practically applied (although in his concurring opinion, Justice Kennedy maintained the possibility that such a standard could be discovered). Writing for the plurality, Justice Scalia argues that in principle no such standard could exist. Justice Scalia explicitly attacks the argument that allows us to get from the equal right to vote to the unconstitutionality of partisan gerrymandering. Contrary to the position in *Davis v. Bandemer* (1986), he argues that political groups have no claim to be treated equally; rather only individual voters have Equal Protection rights. In the case of malapportionment, the individual right to vote is clearly diluted and debased. However, in the case of partisan gerrymandering, Justice Scalia contends, there is no violation of any individual right. Rather the claim of constitutional violation is based on an alleged right of proportional representation for groups, and such a right is not granted by the U.S. Constitution.

Thus Justice Scalia (2004, 288), after noting that the standard proposed by the plaintiffs would only invalidate a district plan if it prevents a majority of voters from electing a majority of representatives, argues:

“... we question whether it is judicially discernible in the sense of being relevant to some constitutional violation. Deny it as appellants may (and do), this standard rests upon the principle that groups (or at least political-action groups) have a right to proportional representation. But the Constitution contains no such principle. It guarantees equal protection of the law to persons, not equal representation in government to equivalently sized groups. It nowhere says that farmers or urban dwellers, Christian fundamentalists or Jews, Republicans or Democrats, must be accorded political strength proportionate to their numbers.”

To the extent that existing arguments for the unconstitutionality of partisan gerrymandering rely on a group right to proportional representation, Scalia’s argument appears decisive. There is no dispute that the Constitution does not enumerate a right to proportional representation for groups. Furthermore, the plaintiffs in *Vieth v. Jubelirer* (2004) appear to rely on just such a claim, simply asserting that a majority partisan group ought to have the right to elect a majority of representatives. Similarly, the argument made for partisan symmetry by four political science professors in *LULAC v. Perry* (King et al. 2006, 4) is that it allows us to determine whether “a districting plan unfairly burdens the representational rights of a *particular political group*” (Italics ours).

However, it is not clear why a right to group proportional representation is *necessary* to justify the majority rule standard – there may be other grounds for this conclusion. We will argue that other such grounds do indeed exist and that they are based strictly on the equal protection of

individual voters. It can be shown that the equal treatment of all individual voters logically implies the majority rule standard – a majority of the voters must be able to elect a majority of representatives. Or to put it another way, in partisan elections it is not logically possible to treat all voters equally without treating all parties equally as well.

The formal result that this argument is based on comes from Hout and McGann (2009a, 2009b). Roughly speaking, this result states that if an electoral system for a legislature treats all voters equally and satisfies some other necessary qualities, then it must give more seats to the party that wins more votes. In a two-party system, the larger of the two parties must have a majority of the vote, and if it receives more seats than its rival, must have a majority of seats. Thus political equality implies the majority rule standard. The importance of this result is that it allows us to get from liberal political equality – the equal protection of individuals – directly to the principle that a majority of voters should be able to elect a majority of representatives.

This does require two assumptions. Firstly we consider the composition of the legislature as a whole, as opposed to considering just the individual districts. We can justify this both by appealing to Article 1§2 of the Constitution, and on the grounds the output of the legislature does in fact depend on the action of the legislature *as a whole* and not just on its individual parts. Secondly, we have to consider the partisan balance of the legislature as an important part of *the results* of Congressional elections. This is justified not because we assign rights to partisan groups, any more than we assign rights to demographic or religious groups; this is justified because the U.S. Congress *as a matter of fact* organizes itself on partisan lines. We turn next to the detailed justification of these two assumptions.

## A. Assumptions

For the argument developed here to go through, it is necessary that voters have a right to equal protection in regard to the results of congressional elections as a whole; and that it is legitimate to consider the partisan balance of power as important part of that result. We doubt it would be difficult to convince political scientists, political journalists or politicians that we do in fact have partisan elections and that the overall balance of power in Congress as a whole matters. The day after the election, newspaper headline are likely to read “Republicans retake House” or “Democrats retain House”. It is not likely (parodying the law review article cited by Justice Scalia) that they will read “There were separate elections between separate candidates in separate districts, and that is all there is!” Contrary to the assertion by the same authors, political parties do not just “compete for specific seats”; they also compete for control of the House. (To be fair to Lowenstein and Steinberg (1985), they are correct in asserting that parties do not compete for statewide vote totals, and that we cannot simply infer a party’s statewide support by adding up the district totals.)

It may seem like common sense that we have partisan elections in which the overall result matters. This, however, does not automatically means that there is a constitutional basis for considering the House of Representatives in such a manner. Indeed, the Supreme Court has denied that results of Congressional elections *as a whole* can be used as evidence of unconstitutional partisan gerrymandering. The plurality opinion in *Vieth v. Jubelirer* (2004) is particularly assertive about this. However, all the dissenting opinions other than that of Justice Breyer also accept this point. In fact the plurality in *Davis .v Bandemer* (1986) comes to the same conclusion. To establish a violation of the Equal Protection clause, it is necessary to produce a district specific claim.

Let us first consider why it is appropriate to consider the composition of the House as a whole. What we are faced with here are two differing conceptions of representation. When we consider the House as a whole we are thinking of it as a single deliberative body representing the people. If its overall composition is stacked against me, then I have been wronged. We can contrast this to what we might call an “atomistic” or “district based” view of representation.<sup>5</sup> Provided the process by which I elect my representative passes muster, I have received equal protection. I cannot argue that the overall process by which Congress is elected discriminates against me. It is as if each representative is treated as a separate, individual magistrate as opposed to a member of a representative body. The assumption seems to be that because I only get to vote for the member from my district, that Member and that Member alone represents me, as opposed to the House as whole.

There are two lines of argument for considering the House of Representatives as a single legislative body rather than as a collection of district representatives. The first is derived from Article 1§2 of the Constitution and applies specifically to the House; the second is drawn from more general considerations of political philosophy and applies to legislatures generally (including potentially state legislatures). Turning to Article 1§2, we can see that this certainly describes elections to the House in collective terms: “The House of Representatives shall be composed of Members chosen every second Year by the People of the several States.” Interestingly it does not even say “the Peoples of the several States”, but rather uses the single collective noun “People” – that is, the people of the United States. There is nothing here to support the view that an individual voter is only represented by their representative and thus does not have a stake in the composition of Congress as a whole. Rather the House of Representative

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<sup>5</sup> See also Weissberg’s (1978) distinction between dyadic and collective representation.

*as a whole* is to be chosen by the people *as a whole*. Indeed districts are not even mentioned in Article 1 – Article 1§4 gives states authority over the “Times, Places and Manner” of elections, but gives the United States Congress the power to overrule them.

In the Federalist Papers likewise we see the House of Representatives described as a single national legislature representing the people as a whole. After all, as is argued in Federalist 39, the House of Representative represents the principle of national government, while the federal principle (that is, territorial representation) is represented by the Senate. Thus Federalist 39 states: “The House of Representatives will derive its powers from the people of America; and the people will be represented in the same proportion, and on the same principle, as they are in the legislature of a particular State.” Similarly in Federalist 52 it is argued: “As it is essential to liberty that the government in general should have a common interest with the people, so it is particularly essential that the branch of it under consideration [the House of Representatives] should have an immediate dependence on, and an intimate sympathy with, the people.” Once again, the conception of representation is collective – the House as a whole needs to be bound to the people as a whole in relations of dependence, sympathy and common interest.

The Supreme Court in *Wesberry v. Sanders* (1964a) reiterates the same arguments. The Great Compromise led to the House representing the people directly and the Senate representing the States. As stated above, this is taken to imply a very high level of political equality in House elections, with every voter being weighted equally. The district principle is not privileged in any way in *Wesberry v. Sanders* (1964a). District elections are not constitutionally necessary and are only permitted to the degree that they do not interfere with the principle that one person’s vote be weighted equally to another’s. The Court notes that this principle “is followed automatically, of course, when Representatives are chosen as a group on a statewide basis, as was a widespread

practice in the first 50 years of our Nation's history” (1964a, 8). States may, if they wish, elect Representatives by district, but only as long as this does not frustrate the requirement that the House be chosen “by the People of the various States”. As a result, states may not “draw the lines of congressional districts in such a way as to give some voters a greater voice in choosing a Congressman than others.” (1964a, 14)

Thus a strong case can be made for considering the composition of the House as a whole based on Article 1§2 of the Constitution. In addition to this, we can also argue that it is necessary to consider the composition of the House as a whole based simply on its nature as a legislature. After all, it is the performance of the House *as a whole* that affects my wellbeing. The House as a whole deliberates and passes laws, not individual members. The output of the House is legislation, and this is intrinsically a collective good. Whether the House passes laws that protect me or do me harm depends not on me having a personal representative, but rather on the entire body. The need to consider the composition of the House as a whole does not depend on its mode of election, but on its nature as a collective decision making body.

It is possible for me to have the ability to elect my representative in a fair and proper manner, but for the legislature as a whole to be stacked against me. Consider the following scenario. The districting and election administration of the district in which I live are beyond reproach. However there are serious abuses (whether malapportionment, gerrymandering or outright fraud) in other districts. This results in massive misrepresentation, so that my representative and those of similar opinion are outvoted. Indeed because of the overwhelming artificial majority in the legislature created by the abuses, my representative and those of similar opinion are irrelevant to policy and law making. By the standards of all the *Vieth v. Jubelirer* (2004) opinions except that of Justice Breyer, I cannot claim that I have been denied equal

protection – I am able to elect *my* representative. Presumably someone in the other districts could claim that their right to equal protection had been violated, unless the abuse was gerrymandering. I, however, cannot because I do not have a district specific case (my district is fine) and I cannot make a case based on the overall composition of Congress. Nevertheless, it appears preposterous to claim that I have received equal protection when the composition of Congress is stacked against me and I can reasonably expect my representative to be completely ignored.

It is also notable that the Supreme Court has not always endorsed an atomistic, “district based” conception of representation. For example, writing for the plurality of the Court in *Georgia v. Ashcroft* (2003, 482) – in fact, for the very same plurality as in *Vieth v. Jubelirer* (2004) – Justice O’Connor argues that, “Indeed, in a representative democracy, the very purpose of voting is to delegate to chosen representatives the power to make and pass laws.” That is to say, the purpose of voting is to influence the provision of the collective good of policy, not just to provide districts with appropriate representation. As a result, it is possible to balance the benefit to a minority population from having influence in a broader number of districts against having an almost guaranteed ability to elect a group member in a smaller number of districts (2003, 479-481). Of course, *Georgia v. Ashcroft* (2003) dealt with The Voting Rights Act as opposed to the Fourteenth Amendment (see Grofman 2006). Nevertheless, there is clear tension between two incompatible conceptions of representation.

Given that it is appropriate to consider the overall composition of the House of Representatives, let us turn to why it is appropriate to think of it in partisan terms. This is a more difficult task. The Constitution does not mention parties, any more than it mentions districts. We may often take it for granted that we have partisan elections in the United States. Justice Scalia, however, in the section quoted above argues that parties have no special status – they are simply

social groups comparable to farmers or Christian fundamentalists (2004, 288). Nevertheless there seems to be something different about the partisan nature of the House. We can talk about the Democrats or the Republicans winning the House. We would not talk about men, Protestants or non-southerners winning the House in the same sense. The question is, what is it that makes elections to the House of Representatives objectively partisan, as opposed to party just being one demographic description amongst others?

The reason we can consider the partisan composition of House as part of the *result* of a House election is the House *as a matter of fact* organizes itself on partisan lines. This partisan organization of the House is an objective *institutional* fact. If this partisan result is systematically biased against certain individuals, or if certain individuals are not given a fair opportunity to influence this result, then they can reasonably claim that they have been denied equal protection. They could also claim that the House has not been chosen by the People in the strongly egalitarian sense advanced by the Supreme Court in *Wesberry v. Sanders* (1964a).

The partisan balance of power in the House of Representatives has a number of direct institutional consequences that voters have a right to be concerned about. Members caucus in the House of Representative on the basis of party. The majority party chooses the Speaker of the House. Which party has a majority will influence the distribution of committee assignments, and in particular committee chairs. The majority party will have a number of procedural advantages, in terms of control of the Rules Committee and the Calendar (see Cox and McCubbins 1993, 2005; Boyce and Bischak 2002). Which party has a majority determines certain significant national posts and is likely to have a strong influence on the character of legislation passed.

In fact, elections to the House of Representatives would still be partisan even if there were no partisans in the electorate. Imagine that the entire population was independent and no-

one had a partisan group identity. Provided that the legislature still organized itself on partisan lines, we still ought to care about the partisan balance in Congress. The Democrats or Republicans would not be identifiable groups in the electorate who could demand the right to elect members of their group – everyone would decide each election on its merits. However, the partisan balance would still matter – it would determine how the House of Representatives was organized. The newspapers the morning after the election would still report that the Democrats or Republicans had captured or retained the House.

Neither is the partisan nature of House elections dependent on party line voting in the House. The level of party discipline in the House has varied over the years, although it has never gone away altogether. If there is very strong party line voting, the output of the legislature will be almost completely determined by its partisan composition. However, even if this is not the case, as long as the parties can remain cohesive long enough to organize the House, the partisan composition of the House will determine the leadership, the committee assignments and other structures such as the rules and the Calendar. These factors will affect the legislative output of the House, even if members do not always vote on party lines.

Thus a strong case can be made for both considering the results of House elections *as a whole* (as opposed to a series of unrelated district elections), and for considering these results in partisan terms. The results need to be considered as a whole because the output of the House (legislation) is intrinsically a collective good, and is determined by the entire House, not by individual members. The results need to be considered in partisan terms because the House *as a matter of fact* organizes itself along partisan lines. If someone were denied an equal opportunity to influence the partisan composition of the House as a whole, it would seem reasonable for them to claim that they did not enjoy the equal protection of the law and that the House was not

chosen by the people. Given these assumptions, we can proceed to the formal, social choice theoretic argument.

### **B. Individual Rights and the Majority Rule Standard**

We may now turn to the formal result. Stated intuitively, if we treat everyone equally, then in a two party system the results must respect the *majority rule* standard – if a party wins a majority of the vote, it must get at least 50% of the seats. More precisely, if we treat every individual voter equally; and we do not discriminate against specific parties or candidates on the basis of their names; and we do not punish parties for winning more votes than they need; then if a party wins more votes than another party, it must win as many seats, if not more. In a two party system, this produces the majority rule standard. The importance of this result is that the standard that a minority of voters cannot elect a majority of representatives does not have to rest on a principle of group representation. Rather it can be justified strictly in terms of equal treatment of individuals.

The result comes from Hout and McGann (2009a, 2009b). It is Proposition 1 in both of these articles. It is based on an earlier result from Hout, Swart and Veer (2006). The Hout and McGann articles go further than we need, introducing further assumptions to produce a justification of proportional representation based on a *liberal* conception of individual equality. We do not need or rely upon these additional assumptions for the argument in this paper.

The result does require that we think of the election result in terms of a *seat allocation function*. A seat allocation function is just an abstraction that takes the vote of each individual voter and returns an allocation of seats to each party. How it does this is left open. A seat allocation function is thus an abstraction that can accommodate the details on any electoral system. However, it does consider the election result *as a whole* and considers it in terms of seat

allocations to parties. This is why it was necessary to argue that it is justified to view the election result in this way.

We can now turn to the axioms required by the result. The idea of political equality is captured by two axioms, anonymity and neutrality. If a seat allocation function is to treat all voters equally it must be anonymous. This means that it does not discriminate between voters based on their names. If we change the names of the voters this does not change the results. An obvious example of a seat allocation system that is not anonymous is a system that gives some people more votes than others. However, there are many more subtle ways that electoral systems can discriminate between voters and thus violate anonymity.

Neutrality means that a seat allocation rule does not discriminate between candidates or parties on the basis of their names. If we exchange the name of two parties then we must also exchange their seat allocations. Neutrality is a minimal requirement of any democratic electoral rule. It is satisfied by the electoral systems of all liberal democracies, including the United States. It does not prevent certain parties being advantaged in terms of where their support comes from. It only prevents the explicit advantaging of certain parties purely in terms of their identities.

The final axiom we need is a technical one – nonnegative responsiveness. This means that a party cannot be penalized for winning extra votes when it retains all its previous support and nothing else changes. Suppose that a party wins the votes of certain voters and is awarded certain seats. Suppose then that the same party retains the support of all those voters, and no-one else changes their vote except for some voters who switch their vote to the party we are considering. Then nonnegative responsiveness means that the party must get at least as many seats as before. This is a minimal requirement that is met by every reasonable *single vote* electoral system, including the first-past-the-post system used in the United States, although a

case can be made for relaxing it when considering ordinal voting systems (where voters rank order the candidates as opposed to voting for only one).<sup>6</sup>

If an electoral system satisfies the requirements of political equality (anonymity and neutrality) and the common sense requirement of nonnegative responsiveness, then it can be shown that it must satisfy the weak plurality ranking property. The weak plurality ranking property means that if one party wins more votes than another party, it must receive at least as many seats. In a two party system this means that the minority party cannot be awarded a majority of the seats.

The proof that anonymity, neutrality and nonnegative responsiveness imply the plurality ranking property is given in Hout and McGann (2009a, Proposition 1, 2009b). Here we can consider the intuition behind the formal proof. We proceed in two steps. First we demonstrate why anonymity and neutrality imply something called the cancellation property. Then we show that if we add nonnegative responsiveness to this we get the weak plurality ranking property. The cancellation property is the property that if two parties have the same vote total they must be allocated the same number of seats. Let us see why anonymity and neutrality imply this property. Consider the voter profile in Table 1. This lists each voter and places an X under the party this voter votes for. Thus voter 1 votes for Party A, voter 2 for Party B, voter 7 for Party C and voter 8 abstains. There may be any number of voters, but in this example we only consider the first eight. First let us consider a situation, as in Table 1, where two parties have the same number of votes. Let us suppose that the cancellation property is not true, and that one party gets more seats

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<sup>6</sup> Multiple vote systems such as plurality run-off and single transferable vote violate nonnegative responsiveness in some cases. This is because it is possible for a party to increase its support and cause another party to be eliminated in that round than otherwise would be the case. As a result, the party faces a stronger competitor in a later round and loses a seat.

than the other (let us assume A gets more seats, for the sake of argument). We can show that this is impossible if anonymity and neutrality are respected.

[INSERT TABLE 1 ABOUT HERE]

Firstly let us change the names of all the voters who vote for Party A and Party B. Each voter who votes for Party A gets the name of a voter who voted for Party B and each voter who voted for Party B gets the name of a someone who voted for Party A. Thus voter 1 is renamed voter 2 and voter 2 is renamed voter 1. Alternatively we could think of this as each voter who voted for Party A now voting for Party B and each voter who voted for Party B now voting for Party A. (Given that the number of voters for each party is assumed equal, the voters match up one-to-one.) This gives the voting profile in Table 2. If the electoral system respects anonymity, this changing around of the voters can make no difference to the result. Therefore Party A must still be allocated more seats than Party B.

[INSERT TABLE 2 ABOUT HERE]

Next let us change the names of the parties. Let Party A now be called Party B and Party B now be called Party A. This gives us the voting profile in Table 3. By neutrality, if we change the names of the parties this is not allowed to change the allocation of seats. The party previously known as Party A (now known as Party B) must win more seats than the Party now known as Party A (previously Party B). That is to say, if Party B gets the support of all the voters who previously supported Party A, by neutrality, Party B must get all the seats that were previously allocated to A. Thus Party B must now receive more seats than Party A.

[INSERT TABLE 3 ABOUT HERE]

The problem is that if we look at Table 3, we see that it is identical to Table 1, except that order of the rows and columns is different. If we rearrange the rows and columns of Table 3

without changing who votes for whom, we end up with a voter profile identical to Table 1 (voter 1 votes for Party A, voter 2 votes for Party B, etc.). By anonymity and neutrality, with the votes in Table 3 Party B must get more seats than Party A. But Table 3 is identical to Table 1, and we started by assuming that in Table 1 Party A gets more seats than Party B. What we have shown is that if Party A gets more seats than Party B despite having the same number of votes, then Party B must also get more seats than Party A. This is obviously impossible. The only way out of this contradiction is to assign the same number of seats to parties with the same number of votes. This is the cancellation property.

By adding the requirement of nonnegative responsiveness we can go from the cancellation property to the weak plurality ranking property. The weak plurality ranking property requires that if one party wins more votes than another party, it must get at least as many seats as it. Suppose we have a voting profile where Party A gets more votes than Party B. Now suppose that some of Party A's voters abstain, so that the vote totals for Party A and Party B are identical. By the cancellation property (which we have already shown can be derived from anonymity and neutrality) the two parties must receive an equal number of seats. Now let the abstaining voters go back to supporting Party A. By nonnegative responsiveness, Party A cannot be disadvantaged by this, it still must have at least as many seats as Party B. This is the weak plurality ranking property. If there are only two parties, this is equivalent to the majority rule standard (the party that receives a majority of the vote should receive at least half the seats in a two party system).

The significance of this result is that it shows that the *majority rule* standard for electoral districting can be derived solely from the principle of the equal protection of individual voters. It does not depend on the principle that equally sized groups are entitled to equal representation, a principle that is not to be found in the Constitution. Rather it is based on the requirement that

individual voters receive equal protection in determining the overall result of the election. Given that the House of Representatives is institutionally partisan, this provides a standard of electoral justice that can be derived from Article 1§2 of the Constitution and the Equal Protection Clause of the 14<sup>th</sup> Amendment.

### **III. A Manageable Standard?**

We argued in the last section that the majority rule standard can be derived from the requirement that the House of Representatives be elected by the people and from the equal protection of individual voters. However, if political gerrymandering is to be adjudicated in the courts, it is necessary to provide a standard that is not only judicially *discernable* – derived from a constitutionally protected right – but also judicially *manageable*. That is to say, there needs to be a method to determine whether unconstitutional political gerrymandering has occurred in a specific case. In the plurality opinion in *Vieth v. Jubelirer* (2004, 288), Justice Scalia argues that the plaintiffs would be unable to provide a manageable standard, even if their proposed standard was judicially discernable. In his concurring opinion, Justice Kennedy notes that the Court has not been shown a “...statement of principled, well-accepted rules of fairness that should govern districting...” (2004, 308), although he leaves open the possibility that these may be found.

Of course, until we have a viable judicially discernable standard, the question of judicial manageability is moot. However, in the last section we laid out the case for the majority rule standard being such a standard. Given this, we can consider how this standard can be implemented. There already exist well-established techniques for measuring whether the majority rule standard is violated. For example, given established patterns of voting, we can calculate the probability that a given districting plan will result in a majority of voters not electing a majority of Representatives.

One complicating factor, however, is that districting plans are produced by each state, while the justification of the majority rule standard in the previous section applies to the House of Representatives as a whole. This is a direct consequence of Article 1 of the Constitution. Section 2 states that the House of Representatives shall be elected by the “People of the several States”. Section 4, on the other hand, gives states authority over the “Times, Places and Manner” of elections, although it gives the United States Congress the power to overrule them. We thus need to produce a standard that can be applied to state districting plans that ensures that the majority rule standard is respected nationally.

Requiring that each state's districting plan satisfy the majority rule standard does not guarantee that a majority of voters nationally will be able to elect a majority in the House of Representatives. To ensure this, we require a stricter standard at the state level, that of partisan symmetry. Partisan symmetry is defined as the requirement that “the electoral system treat similarly-situated political parties equally, so that each receives the same fraction of legislative seats for a particular vote percentage as the other party would receive if it had received the same percentage” (King et al. 2006, 4-5).<sup>7</sup>

Let us turn now to how the partisan symmetry standard can be constitutionally justified. The previous section showed that the majority rule standard is a logical consequence of the requirement that the House be elected by the people and the equal protection of all voters, and thus can be justified in terms of the Constitution. If partisan symmetry is, in turn, a necessary condition for satisfying the majority rule standard, then any violation of partisan symmetry implies a violation of the election of the House by the people and the equal protection of voters.

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<sup>7</sup> That is to say, if party A wins 60% of the vote to Party B's 40%, and gets 14 seats out of 20, then party B would have to get 14 seats if it was to win 60% of the vote.

All that remains is to show that partisan symmetry in statewide districting is a necessary condition for the majority rule standard to apply to Congress as a whole.

In the case of the justification of the majority rule standard in the last section, the partisan outcome that matters is the balance of Congress nationally – that is, who holds a congressional majority. We have argued that the balance of the parties is an inescapable part of the result, not because voters think of themselves as partisans, but because Congress organizes itself along party lines. That is, the partisan nature of the result is an *institutional fact*. However, this argument applies to Congress as a whole, not the individual state delegations. Who has a majority in Congress has major institutional and political consequences; who has a majority of the (say) Pennsylvania delegation does not, at least not to the same degree. If we are to treat all U.S. citizens equally, then it is necessary that a majority of voters nationally should be able to elect a majority of representatives.

However, the constitutionality of state districting plans has to be judged on a state-by-state basis. While we have a decentralized system where each state draws its own districts (that is, the power of Congress to overrule the states is not invoked), states cannot be required to draw its districts based on how they expect other states to draw theirs. In principle we could maintain national partisan majority rule by having the Court force states to co-ordinate so that the bias in different states cancel out. In effect the Court would have to order one state to make its districting biased in favor of party A in order to balance out the bias in favor of party B in another State. This would be a revolutionary change, effectively nationalizing the districting process. Given that this is unlikely to be acceptable, the only alternative is to demand that all states district in such a way that it would be unbiased in its own right. Only by doing this can we guarantee that a national majority of voters can elect a national majority of representatives.

Partisan symmetry is a necessary condition of a state districting plan that ensures that a majority of U.S. voters can elect a majority of representatives, and thus ensures that all voters are equally protected. Clearly, the weaker quality of the majority rule standard at the state level is also necessary. If state districting plans are biased so that a minority can elect a majority of a state's delegation, it is obviously possible that a national minority may be able to elect a congressional majority. However, the majority rule standard at the state level is clearly not enough. Imagine that we had a districting plan that gave a majority of a state's delegation to whichever party won a majority of the state's vote. However, suppose this districting plan resulted in Party A winning 16 seats out of 20 if it won 55% of the statewide vote, but only gave Party B 11 seats out of 20 if it won 55%. If such a districting scheme was generalized nationally, it could clearly give Party A a majority in Congress even if it only won a minority of the votes. To ensure that the party that wins the national vote gets a majority of the seats, it is necessary that both parties be treated equally in the event that they win 55% of the vote – that is, we must require symmetry.

Symmetry at the state level is a necessary condition for guaranteeing a national majority can elect a congressional majority, but it is not a sufficient condition: This requires the stronger condition of statewide proportionality. The problem with statewide proportionality is that achieving this might require overhauling the entire U.S. electoral system. Even if statewide proportionality is not practical in the context of the United States, statewide symmetry clearly is – many state districting schemes have satisfied it (see Gelman and King 1994a, 546). And although statewide symmetry does not guarantee that a national voter majority will elect a majority of seats, it does severely reduce the scope for bias nationally.

Thus we can see that partisan symmetry is a necessary consequence of ensuring that a majority of voters can elect a majority of representatives, which is itself a necessary consequence of the election of the House by the People and the equal protection of individual voters. Partisan symmetry has the added advantage of being clearly measurable. In fact the technology to measure it is already well developed and peer-reviewed (see King et al. 2006; Gelman and King 1994b, 1994a, 1990; King and Browning 1987).

It might be objected that the symmetry measure is based on counterfactual reasoning. However, it is entirely appropriate that a *measure* of electoral fairness be based on counterfactual reasoning, because the *concept* of fairness in a contest is inherently counterfactual. Rules are not unfair because they happen to produce a particular outcome in a particular case; they are unfair because of the outcomes that they *would* produce under different conditions. Whether I *happen to* win a lottery or not has no bearing on whether the lottery is fair or not; whether a lottery is fair depends on what would have happened if the world had turned out differently – that is, on whether I had the *opportunity to* win that I was promised. A baseball game where one team has to hit the ball 400 feet for a home run, while the other team has to hit it 500 feet, is unfair (assuming no justifying circumstances) even if in a particular game no batter hits the ball 400 feet or more. It is unfair because if (hypothetically) the ball had been hit 450 feet, the two teams *would* have been treated differently. The two teams did not have the same opportunity to score a home run.

Justice Kennedy in the plurality opinion on *LULAC v. Perry* (2006, 420) adroitly notes that the measure depends “on conjecture about where possible vote-switchers will reside.” This is inescapable for any measure because the *actual results* in a district-based election system depend on where voters live. It is in the nature of district-based electoral systems that 50 voters

changing their votes in one district may change the result, while 50,000 voters changing their votes in another district may have no effect at all. What the symmetry measure assumes is that the relative pattern of support for parties remains relatively stable compared to what it has been in the recent past. This appears to be the case empirically, and the extent to which this is not so is reflected in the estimates of bias. This assumption of approximately uniform partisan swing (see King 1989, 796-8) does not appear to be controversial amongst political scientists. For example, as Grofman and King (2007, 15) point out, the expert witnesses for both the plaintiff and the defendant in *LULAC v. Perry* (2006) “were in remarkable agreement about the partisan implications of the plans whose partisan bias they investigated.” Indeed in his dissenting opinion, Justice Stevens (2006, 465-6) used the counterfactual results of the state’s expert (Professor Gaddie) to show that proposed plan violated the symmetry standard.

Justice Kennedy (2006, 420) also argues that the amici fail to provide a standard for deciding how much partisan asymmetry is too much. In response, Professors Grofman and King (2007, 5) echo Justice Stevens’ (2006, 468) opinion that it is the place of the Court, not social scientists, to set the standards for what is constitutional and what is not. However, the amicus brief (2006) certainly does provide workable standards that the Court could choose to adopt. For example the Court could adopt a quantitative standard – Justice Stevens (2006, 468) suggests that the Court could adopt a 10% deviation from symmetry standard, similar to the 10% standard for malapportionment. Another alternative suggested by the amici is that a districting plan be considered unfair if it deviates from symmetry by at least one whole seat. Social scientists can provide a precise measure of how unfair a districting plan is, just as an expert witness on DNA evidence can provide a precise estimate on the probability of a false identification; neither, however, can tell a court exactly how much uncertainty constitutes reasonable doubt.

If the Court is unsure about the appropriate standard, it could choose a standard that is conservative. For example it could overturn plans that both have statistically significant bias at the 5% level and deviate from symmetry by at least a whole seat. Where there is reasonable doubt, the courts would have to allow the original plan to stand. However, it is important to realize in the case of a considerable number of states it does not really matter which test we use – these states violates virtually any conceivable test of partisan symmetry. As we will see in the next section, the partisan asymmetry of the current Pennsylvania districting plan is not 10%, but 36%. The probability of this happening by chance is not the 5% conventionally required in scientific inference; it is essentially zero. The number of seats at stake is not one, but rather four. There will be hard or borderline cases where the choice of standard will matter. However, with Pennsylvania and many of the most biased states, this is simply not the case. It seems strange to argue that the courts cannot offer relief in cases of egregious partisan gerrymandering because there may be some hard cases where the exact choice of standard may make a difference.

Various Justices in the case of *LULAC v. Perry* (2006) responded favorably to the partisan symmetry test proposed to the amici (2006) – for example Justice Stevens, joined by Justice Breyer (2006, 468) commend it as being “...a helpful (though certainly not talismanic) tool in this type of litigation.”<sup>8</sup> However, based on social science results that were not yet published at the time of *LULAC v. Perry* (2006), it can be argued that it is considerably more than this. Rather than simply being one potential test amongst many, partisan symmetry is a *necessary condition* for a districting scheme that provides equal protection to all individual voters. While partisan symmetry ostensibly measures fairness to parties (which is not

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<sup>8</sup> Justice Souter, joined by Justice Ginsberg, (2006, 483) does not “rule out the utility of a criterion of symmetry as a test.” Justice Kennedy (2006, 420), writing for the plurality, does not completely dismiss the usefulness of the measure, although he concludes that “asymmetry alone is not a reliable measure of unconstitutional partisanship.”

constitutionally protected), it is logically entailed by the equal protection of individual voters, which does enjoy constitutional protection. If partisan symmetry is violated, then we can conclude with no further evidence that individual voters are not being treated equally in a way that may substantially change the composition of Congress or even change the overall result of the election.

#### **IV. Measuring Partisan Asymmetry in Practice**

We can demonstrate how the proposed measure of partisan symmetry can be calculated. We follow the approach of Gelman and King (1994b). However, we do not use the `JudgeIt` software later developed by those authors, but rather do the estimation ourselves using R software. Full details of the estimation is given in McGann et al. (forthcoming). To summarize, we generate a seats/votes function for each state – how many seats would a party get if it won a certain percentage of the vote. We can calculate this from the actual election results in each district using the assumption that the swing in support between the parties is approximately evenly spread across the districts.<sup>9</sup> Of course, we realize that in reality that there are many local and idiosyncratic factors at work in addition to changes in the aggregate level of party support. For this reason we run a thousand simulations where the party's support in each individual district is changed by a random amount. (Empirical evidence suggests that these local effects are large, averaging five percentage points.) From these seats/votes functions we calculate symmetry scores for each state. These measure the degree to which the Democrats and Republicans receive the same number of seats for the same seat share – a score of 0 indicates symmetry, while 100%

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<sup>9</sup> We used the two-party vote share in each district. In districts where both parties did not run, we used the Presidential vote apportioned over the Congressional district as an instrument to estimate the relative support of the two parties.

means the Democrats get all the seats if their vote share is between 45% and 55% and -100% means that the Republicans get all the seats under the same conditions.

We should note that the model underlying these calculations is extremely simple.<sup>10</sup> We simply take the current distribution of support and ask what would happen if Democratic support increased or decreased by a certain amount in every district. We could produce a simplified version of this using nothing more than a spreadsheet. Of course, this simplified model would not take into account how local or idiosyncratic factors could disturb a gerrymander, and would not give us a way to measure the uncertainty of our estimates. However, it is important to remember that advanced math and statistics are not required to make a prima facie case of partisan gerrymandering. Having said that, from a legal point of view it is extremely important to be able to provide precise margins of error and measures of how certain we are that partisan bias exists.<sup>11</sup> This, indeed, is a major advantage of this approach.

We can consider a couple of real world examples. Massachusetts in Figure 1 is an unbiased winner-take-all plan. It is approximate unbiased, as can be seen from the symmetry of the graph. (There is actually a small bias towards the Republicans, but this is not statistically significant, and makes no difference given that the Democrats typically win 65-70% of the vote).

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<sup>10</sup> We would note that it is possible to estimate more complex models of district level voter behavior taking into account a variety of other factors. Indeed, software such as JudgeIt allows such models. We have deliberately not estimated a complex behavioral district level model. Our interest is not in district level behavior, but rather in how the districting scheme mechanically translates a hypothetical uniform change in support across districts into a change in seats. We would be particular skeptical of models that use factors such as incumbency and candidate quality as explanatory variables, which surely should be treated as endogenous. Of course, we accept that many factors other than overall support for a party can affect the vote in a given district. This is why we run thousands of simulation with large random perturbations of the result in each individual district.

<sup>11</sup> The uncertainty surrounding of estimates of bias will vary for a variety of reasons. For example, we would expect the margin of errors to be larger for states with only a small number of districts, as small vote changes could produce very large changes in the proportion of seats going to each party. This, indeed, is exactly what we find.

It is extremely responsive between 40% and 60% of the vote – 1% more in vote share means 3.6% more in seat share. This responsiveness is, of course, advantageous to the Democrats. They are able to win all ten Massachusetts seats. However, the plan is not biased. If the Republicans were to win 65-70% of the vote in Massachusetts, they would also win all ten seats.

[INSERT FIGURE 1 ABOUT HERE]

Figure 2 gives the seats/votes function for Pennsylvania in 2012, which is a highly biased districting plan. As is apparent, it is far from symmetric. In fact the graph misses the 50% votes/50% seats point by 20 percentage points! The symmetry score is actually 36% in favor of the Republicans. It is moderately responsive between 45% and 55% of the vote – its score is 1.4. At 50% of the vote, the Democrats expect to win about 30% of the seats. The slope of the curve does increase sharply a bit past 50%. However, the Democrats would need to win between 57 and 58% of the vote to win half the seats.

[INSERT FIGURE 2 ABOUT HERE]

We can carry out this procedure for every state. Appendix 1 gives the symmetry scores for every state and indicates in which states this bias is statistically significant. It also gives the 5% and 95% confidence intervals. One thing that is notable is that the symmetry measure very clearly distinguishes between those states with unbiased districting plans and those with strong partisan bias. The majority of states clearly do not have statistically significant partisan bias, and would face no risk of litigation if this standard were adopted. However, most of the states that do have significant bias have very high levels of bias. Small changes in methodology would not affect the conclusion in such states. Indiana is the only real borderline case. This is important because Justice Kennedy raised the concern in his opinion on *Vieth v. Jubelirer* (2004, 308) that

in the absence of a clear standard confining judicial intervention, the results of cases would be “disparate and inconsistent.” The symmetry standard, however, gives clear, unambiguous guidance on when intervention is necessary and when it is not.

## V. Conclusion

The absence of a standard for partisan gerrymandering that is acceptable to the Supreme Court means that even the most egregious cases of partisan gerrymandering cannot be challenged. Nevertheless, however tempting it may be, we cannot just make up a suitable standard. A standard for partisan gerrymandering needs to be both *scientifically* and *legally* valid. It must be scientifically valid in that it is a correct measure of the phenomena we are trying to capture – there is no point having an excellent measure if it is measuring something else. It also has to be legally valid in the sense that it is judicially discernable (can be derived from a constitutionally protected right) and judicially manageable (provides clear guidance for judicial decision making).

The way to find a standard of partisan gerrymandering that is judicially discernable and manageable is not to set out on a quest for a mysterious “new” standard that no scholar or lawyer has yet had the gumption to recognize. Neither is it to try to mold a standard out of fresh clay based on our readings of decades-old legal opinions. Rather, we contend, we should take the valid measures given to us by established science and work far harder at showing that these represent something that can be grounded in constitutionally protected rights.

Having said this, it is necessary for our measure of partisan gerrymandering to meet the needs of legal adjudication. A complex multivariate model with fourteen explanatory variables may well get published in a political science journal, indeed even a top political science journal. Such a model, however, would be problematic as the basis for a judicial standard. It would be

too easy to challenge the exact specification of the model, and there would always be the suspicion that if the model were specified slightly differently it would yield different results. We would note that a growing number of methodologists in political science advocate simpler models for this reason (Achen 1999, 2005; Taagepera 2008). In addition to being scientifically valid, a legally useful measure needs a number of other qualities (see, for example, Hastie 2011). For example, it needs to be reliable (when recalculated, it gives the same result), predictable (interested parties can anticipate the result) and be equitable (similar cases produce similar results). These goals are best served by measures that are relatively simple. While the nature of partisan gerrymandering means that we need to rely on statistical techniques to measure it, we should choose the simplest and most transparent versions of these techniques possible.

We have provided a legal justification for partisan symmetry as a standard for adjudicating partisan gerrymandering cases. Using recent results from mathematical social choice theory, we have shown that the majority rule principle can be derived from an individual right to equal protection. Given that the majority rule principle is judicially discernable, we show that the majority rule principle applied at the national level logically implies the partisan symmetry standard at the state level. Partisan symmetry is the primary accepted measure of partisan bias in political science, and there already exists all the technology we need to measure it. Thus we have the fortuitous result that our legal argument provides a constitutional justification for the very measure political scientists already use to measure partisan gerrymandering. Furthermore, as we have shown, it is a measure that is judicially manageable in that it gives clear guidance as to when the Courts should act and when they should not.

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