"DUEL" DILIGENCE: SECOND THOUGHTS ABOUT THE SUPREMES AS THE SULTANS OF SWING

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ABSTRACT: *We respond to Professor Lynn A. Baker's criticisms of our article,* The Most Dangerous Justice: The Supreme Court at the Bar of Mathematics. *Professor Baker fundamentally misunderstands our measure of Supreme Court voting power. Moreover, she erroneously presumes that the "median Justice" wields the bulk of the Court's power. Even if there were a median Justice, it is far from clear whether he would be the Most Dangerous Justice. We conclude with a clarification of the median voter theorem and its implications for the distribution of voting power within the Supreme Court.*

I. EN GARDE

Joining issue is indeed "the sincerest form of flattery,"[1] and we are pleased that Professor Lynn A. Baker has taken the trouble to study and respond to our Article, *The Most Dangerous Justice: The Supreme Court at the Bar of Mathematics*.[2] We suspect, however, that Professor Baker comes to bury our "intimidatingly complex mathematical methods,"[3] not to praise them.[4] Conjecturing that "something is amiss in the logic or mechanics" of our analysis, Professor Baker argues that our "elaborate mathematics [are] both unnecessary to the project and explicitly based on assumptions that are inappropriate to the question [we] claim to seek to answer."[5]

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Daniel A. Farber and Suzanna Sherry supplied helpful suggestions.

1. Lynn A. Baker, *Interdisciplinary Due Diligence: The Case for Common Sense in the Search for the Swing Justice*, 70 S. CAL. L. REV. 187, 187 n.* (1996).

2. Paul H. Edelman & Jim Chen, *The Most Dangerous Justice: The Supreme Court at the Bar of Mathematics*, 70 S. CAL. L. REV. 63 (1996).

3. Baker, *supra* note 1, at 190.

4. *Cf.* WILLIAM SHAKESPEARE, JULIUS CÆSAR, act 3, sc. 2, l. 78 (Lawrence Mason ed., 1959) [hereinafter JULIUS CÆSAR] ("I come to bury Cæsar, not to praise him.").

5. Baker, *supra* note 1, at 190.

Tempted though we are to say "Professor Baker is a dreamer; let us leave [her]: pass,"[6] we will defend our model of Supreme Court voting power against the charge that it is "seriously flawed."[7] In particular, we can and will justify our choice to focus on feasible five-Justice coalitions. Her misreading of our Article undermines another of her criticisms, that we rely unduly on the Justices' past votes in order to predict their future behavior. Finally, Professor Baker fails to distinguish the most powerful Justice from the median Justice. Her implicit decision to equate the two concepts belies her reliance on a simplistic public choice model that is wholly unsuited for serious analysis of Supreme Court voting.

At the end of her paper, Professor Baker proposes her own measures of Supreme Court power. We will discuss what she is measuring and, more importantly, what she is not. At heart Professor Baker seeks to find the Court's median Justice, a quest that we forswore in *The Most Dangerous Justice*.[8] We now take up Professor Baker's gauntlet. A variant of the generalized Banzhaf index that we developed in *The Most Dangerous Justice* more accurately determines the Court's median voter. This modified index offers strong, almost startling, empirical support for our own theory on the implications of the median voter theorem for the distribution of power on the Supreme Court.

II. PARRY

Professor Baker argues that our model is "full of sound and fury, signifying nothing"[9] because we (1) assign undue—indeed, exclusive—weight to five-Justice coalitions,[10] (2) analyze "feasible coalitions" rather than "all actual coalitions" or "all theoretically possible coalitions,"[11] and (3) rely on the Justices' past performance to predict their future voting and coalition-building patterns.[12] We will refute each alleged flaw in turn. In the end, Professor Baker's rebukes

6. JULIUS CÆSAR, *supra* note 4, act 1, sc. 2, l. 27.

7. Baker, *supra* note 1, at 193.

8. *See* Edelman & Chen, *supra* note 2, at 97.

9. Baker, *supra* note 1, at 192 (quoting WILLIAM SHAKESPEARE, MACBETH, act 5, sc. 5 (Eugene M. Waith ed. 1954) [hereinafter MACBETH]).

10. *See* Baker, *supra* note 1, at 193-96.

11. *See id.* at 196-98.

12. *See id.* at 198-200.

merely befuddle us without shaking our confidence in our model; "[t]he attempt and not the deed / Confounds us."[13]

A. "EDELMAN AND CHEN . . . CONSIDER ONLY FIVE-JUSTICE COALITIONS"[14]

Professor Baker criticizes us for focusing on five-Justice blocs to the exclusion of larger coalitions. She asserts that a Justice's voting power is as evident in larger coalitions as in smaller ones.[15] For the moment we shall leave aside her decision to identify the median Justice as the most powerful Justice. For now we will weigh her objection in light of the following hypothetical.

Suppose that the fictional Justice Milquetoast decides that he will always vote in the majority. If necessary, Justice Milquetoast would pass his turn during the Conference of the Justices and withhold his views from his colleagues until a decisive consensus emerges. (Any resemblance to a former Chief Justice of the United States is strictly coincidental and certainly unintentional.) By virtue of this voting strategy, Justice Milquetoast would vote with the winning side in every case before the Court. Professor Baker evidently would rate Justice Milquetoast the most powerful Justice. But Justice Milquetoast will have no influence on any outcome in any case decided by a coalition numbering more than five. Once five other Justices have come to an agreement, Justice Milquetoast will automatically join them. He can influence the actual outcome of a case in exactly one situation: breaking a 4-4 tie among the other Justices. Justice Milquetoast's vote would then create a decisive five-Justice coalition, which conveniently happens to be the very type of coalition we analyze. Given a reasonably realistic set of votes from a hypothetical Supreme Court Term, we could compute Justice Milquetoast's actual power. One thing, however, should be amply clear. Professor Baker's suggestions notwithstanding, the habit of voting with the majority does not, standing alone, determine a Justice's influence.

At bottom, Professor Baker's model assigns inordinate power to a Justice who invariably votes with the majority. The historical examples of William Johnson, John Marshall Harlan, and Oliver Wendell Holmes, Jr., show that some degree of deviation from the Court's

13. MACBETH, *supra* note 9, act 2, sc. 1.

14. Baker, *supra* note 1, at 193.

15. *See id.* at 195.

center of gravity can be an essential element of judicial influence.[16] If anything, a mind-numbing tendency to agree with everything the Court does is a hallmark of insipid, vapid jurisprudence.[17] Under these circumstances, to characterize the median Justice as holding the balance of power on the Supreme Court is a call to armed rebellion:

> Ye gods, it doth amaze me,
> A man of such a feeble temper should
> So get the start of the majestic world,
> And bear the palm alone.[18]

Perhaps Professor Baker's misunderstanding of our model stems from our initial, admittedly naïve use of 5-4 decisions to quantify the relative strengths of the Justices' votes.[19] But we never restrict ourselves to 5-4 decisions. Indeed, to do so would be completely contrary

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16. *See, e.g.*, FELIX FRANKFURTER, MR. JUSTICE BRANDEIS 80 (1932) (characterizing Justice Holmes as a dissenter from the substantive due process jurisprudence of the Supreme Court during the early twentieth century); FRANK B. LATHAM, THE GREAT DISSENTER, JOHN MARSHALL HARLAN, 1833-1911 (1970); DONALD G. MORGAN, JUSTICE WILLIAM JOHNSON: THE FIRST DISSENTER (1954).

17. *See* Frank H. Easterbrook, *The Most Insignificant Justice: Further Evidence*, 50 U. CHI. L. REV. 481, 491 (1983) (using the number of dissents by a Justice as a negative indicator of judicial "insignificance"); *cf.* David P. Currie, *The Most Insignificant Justice: A Preliminary Inquiry*, 50 U. CHI. L. REV. 466, 474, 475 n.60 (1983) (describing other "sure-fire indicators of an inferior mind"). *But see* United States R.R. Retirement Bd. v. Fritz, 449 U.S. 166, 176-77 n.10 (1980) ("The comments in the dissenting opinion about the proper cases for which to look for the correct statement of the equal protection rational-basis standard, and about which cases limit earlier cases, are just that: comments in a dissenting opinion."). *See generally* Thomas G. Walker, Lee Epstein & William J. Dixon, *On the Mysterious Demise of Consensual Norms in the United States Supreme Court*, 50 J. POL. 361 (1988).

18. JULIUS CÆSAR, *supra* note 4, act 1, sc. 2. Any resemblance between Julius Cæsar and any sitting Supreme Court Justice is, once again, strictly coincidental and certainly unintentional.

19. *See* Edelman & Chen, *supra* note 2, at 68-73. Professor Baker's misunderstanding may be even more fundamental. She evidently follows different criteria for identifying five-Justice coalitions. In her list of "five-Justice winning coalitions" for the 1994 Term, see Baker, *supra* note 1, at 213 (Appendix A), she includes one case that we exclude. Exactly one paragraph of *United States v. Aguilar*, 115 S. Ct. 2357 (1995), can be read as the product of a five-Justice coalition. We accordingly excluded this case from our tabulations. *See* Edelman & Chen, *supra* note 2, at 70-71 (Table 2.1.1). We harbor far deeper disagreements with Professor Baker's list of five-Justice coalitions for the 1995 Term. *Compare* Baker, *supra* note 1, at 216-17 (Appendix B) *with* Edelman & Chen, *supra* note 2, at 71 (Table 2.1.2). We omit five cases that she includes in her list of 5-4 decisions for the 1995 Term. Almost all of Justice Kennedy's opinion in Koon v. United States, 116 S. Ct. 2035 (1996), garnered the unanimous support of the Court. Although only four other Justices—Chief Justice Rehnquist and Justices O'Connor, Scalia, and Thomas—joined his entire opinion, at no proint did the opinion of the Court lack the support of more than three Justices. *See id.* at 2054 (Stevens, J., concurring in part and dissenting in part) (joining all but part IV-B-1 of the majority opinion); *id.* (Souter, J., concurring in part and dissenting in part, joined by Ginsburg, J.) (joining all but part IV-B-3 of the majority opinion); *id.* at 2056 (Breyer, J., concurring in part and dissenting in part, joined by Ginsburg, J.) (joining all but part IV-B-3 of the majority opinion). Four decisions within Professor Baker's list of "five-Justice coalitions"

to our model. The data set underlying our more sophisticated index consists of an entire Supreme Court Term, ranging from 5-4 decisions to unanimous decisions. After collecting all actual coalitions that form during any particular Supreme Court Term (or Terms), we construct an additional set of feasible coalitions derived from the intersections of the actual coalitions. October Term 1994 generated only eleven actual five-Justice coalitions. Our power ratings for that Term, however, were based on a total of seventy-one five-Justice coalitions. The additional coalitions were imputed from the intersections of larger actual coalitions as described in the paper. Thus, the information about coalitions larger than five Justices is included in the model, although perhaps not as obviously as Professor Baker might like.

For example, consider how the intersection of two distinct seven-Justice coalitions might yield a feasible five-Justice coalition that did not actually appear during the Term. In the 1994 Term, the coalition consisting of Chief Justice Rehnquist and Justices O'Connor, Scalia, Kennedy, Thomas, Ginsburg, and Breyer prevailed in *United States v. Mezzanatto*.[20] A different coalition, that of Justices Stevens, O'Connor, Scalia, Kennedy, Souter, Ginsburg, and Breyer, emerged in *Garlotte v. Fordice*.[21] The feasible coalition that is imputed from the intersection of these actual coalitions consists of Justices O'Connor, Scalia, Kennedy, Ginsburg, and Breyer. The two 7-2 decisions that did take place thus contributed to our final measure of voting power for that Term. (Note the presence of all four of the 1994 Term's power pageant finalists in the imputed five-Justice coalition.)

Two six-Justice coalitions from the 1994 Term allow us to illustrate our method in an even more striking way. Chief Justice Rehnquist and Justices O'Connor, Kennedy, Souter, Ginsburg, and Breyer coalesced long enough to decide a substantial portion of *Witte v.*

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for the 1995 Term—Medtronic, Inc. v. Lohr, 116 S. Ct. 2240 (1996); Montana v. Egelhoff, 116 S. Ct. 2013 (1996); Bush v. Vera, 116 S. Ct. 1941 (1996); Morse v. Republican Party, 116 S. Ct. 1186 (1996)—suffer from the opposite problem. By our count, none of these four cases produced more than a four-Justice coalition for any particular set of legal propositions. *See* Edelman & Chen, *supra* note 2, at 92 & nn.120-21. Professor Baker's inclusion of these four cases is all the more puzzling in light of her decision to describe *Denver Area Educational Telecommunications Consortium, Inc. v. FCC*, 116 S. Ct. 2374 (1996) as a "four-Justice winning coalition[]" and *Colorado Republic Campaign Committee v. FEC*, 116 S. Ct. 2309 (1996) as as "three-Justice winning coalition[]." Baker, *supra* note 1, at 217. We do not understand how she could correctly exclude the first amendment cases out of Colorado from her tally of 5-4 cases, yet treat every other nonmajority decision from the 1995 Term as though it generated an opinion attracting exactly five Justices.

20. 115 S. Ct. 797 (1995) (Thomas, J.).

21. 115 S. Ct. 1948 (1995) (Ginsburg, J.).

United States.[22] A second six-Justice coalition, consisting of Justices Stevens, O'Connor, Kennedy, Souter, Ginsburg, and Breyer, decided three cases during that Term.[23] The five-Justice coalition that we derived from the intersection of these six-Justice coalitions never actually emerged during the 1994 Term. The feasibility of this coalition—namely, Justices O'Connor, Kennedy, Souter, Ginsburg, and Breyer—became fully apparent in the 1995 Term, when it delivered the crucial five votes that decided *Gasperini v. Center for Humanities, Inc.*[24]

In a vivid though anecdotal way, the *Gasperini* example illustrates the effectiveness of our method for identifying feasible coalitions among the Justices. We will now defend that method in a more systematic fashion.

B. The Feasibility Frenzy

In *The Most Dangerous Justice*, we explained our methodology for constructing feasible coalitions and for computing a voting power index based on those feasible coalitions.[25] Professor Baker attacks our technique root and branch. "[W]hy are the *intersections* of actually occurring winning coalitions relevant to the search for the median Justice?" she asks. "Why don't Edelman and Chen simply consider all possible coalitions to constitute the set of 'feasible coalitions'?"[26] That would certainly be a "simple" way to proceed, but (in the words of our esteemed former President) "it would be wrong."[27]

The foundation of Professor Baker's objection, of course, is not the number of coalitions taken into account, but the use of intersections per se. Let us begin our defense by identifying points on which we and Professor Baker agree. We took as our first premise the proposition that there are some alliances on the Supreme Court that will never form.[28] Professor Baker apparently accepts this supposition.[29]

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22. 115 S. Ct. 2199 (1995) (O'Connor, J.).

23. *See* Babbitt v. Sweet Home Chapter of Communities for a Great Oregon, 115 S. Ct. 2407 (1995) (Stevens, J.); McIntyre v. Ohio Elections Comm'n, 115 S. Ct. 1511 (1995) (Stevens, J.); O'Neal v. McAninch, 115 S. Ct. 992 (1995) (Breyer, J.).

24. 116 S. Ct. 2211 (1996) (Ginsburg, J.).

25. *See* Edelman & Chen, *supra* note 2, at 81-83; *see also id.* at 83 (explaining how a credible threat of defection affects a Justice's voting power).

26. Baker, *supra* note 1, at 196 (emphasis in original). Note again that Professor Baker equates the median Justice with the Most Dangerous Justice.

27. Thomas D. Elias, *Nixon Library Set to Open July 19*, S.F. Examiner, July 1, 1990, at E6 (quoting President Nixon's Watergate tapes: "We could do it, but it would be wrong."). *See generally* United States v. Nixon, 418 U.S. 683 (1974).

28. *See* Edelman & Chen, *supra* note 2, at 67.

Or does she? Professor Baker's suggestion that we "consider all possible coalitions to constitute the set of 'feasible coalitions'" effectively presumes that all possible coalitions among Justices are plausible and equally likely to form. To ignore ideological incompatibility among certain Justices, as Professor Baker implicitly does, is to trivialize the entire exercise of computing the Justices' voting power. Unless we accept the premise that ideological divisions within the Court impose absolutely *no* limits on the plausible range of alliances among the Justices, we must use some method for distinguishing between feasible and implausible coalitions. Intersections among actually observed coalitions are one such method. Although we admit that intersections of actually observed coalitions are an awkward and at best indirect measure of ideological constraints on Supreme Court decisionmaking, they are (at least in the short run) necessary. In any given Term, the Court will have fewer than 100 opportunities to reveal what we call its coalitional deep structure—namely, unstated but immovable ideological limits on the Justices' ability to form coalitions.

It may well be that a larger number of cases decided by a single Court would obviate the need to rely on a mathematical surrogate for the Justices' coalition-building propensities. Our data from the 1994 and 1995 Terms provide some support for this view. There is greater convergence between the naïve power index based solely on 5-4 decisions from these two Terms and the sophisticated power index for that time period than there is between the naïve index for either Term standing alone and the sophisticated index for that Term. The mean square error between the naïve index and our generalized Banzhaf index for the 1994 Term, the 1995 Term, and the union of both Terms shows how the naïve index approaches the sophisticated index as the number of actual cases increases:

TABLE 2.1: MEAN SQUARE ERROR BETWEEN THE NAÏVE AND GENERALIZED BANZHAF INDEXES OF SUPREME COURT VOTING POWER

1994 Term:	.006649
1995 Term:	.008112
1994 and 1995 Terms:	.002356

29. *See* Baker, *supra* note 1, at 199 ("Even casual Court watchers would surely contend, for example, that Justice Scalia is likely to agree with Justice Thomas much more often than with Justice Ginsburg over the course of any one Term.").

Of course, waiting on the Court carries its own hazards. The jurisprudence of individual Justices does evolve over time. No one, for example, would equate the Harry Blackmun of October Term 1971 with the Harry Blackmun of October Term 1993.[30] Moreover, the Court's personnel is in constant flux. The haphazard removal and addition of Justices turns the art of predicting Supreme Court coalitions into a most treacherous game of chance. We may either wait, perhaps bootlessly, for one group of Supreme Court Justices to accumulate a workable record of decisions, or we may proceed with an imperfect but mathematically cogent measure of the Court's voting power.

For the time being, then, intersections of observed Supreme Court coalitions remain necessary, and we adhere to a methodology that relies on such intersections. This brings us to Professor Baker's second objection. She complains that "it is not clear why one should be concerned with whether '[t]he [four-Justice] coalition obtained by removing [a particular] Justice [from a given five-Justice feasible coalition] is a feasible coalition as well.'"[31] This technique, she writes, is "both unnecessary and destined to yield meaningless results."[32] According to her, this strict definition of feasibility is unnecessary "because the stated task is to identify the median or most powerful Justice over the course of a particular Term, not the 'swing' Justice of a single decision of the Court."[33]

Once again Professor Baker misreads our project. We do not wish to discover the median Justice; rather, we are trying to identify the Most Powerful Justice by computing the likelihood that a particular Justice will cast the decisive vote over a broad spectrum of Supreme Court controversies. Whether our index is "destined to yield meaningless results" is a question we will leave to critics who actually understand our methodology.

30. *Compare, e.g.*, Furman v. Georgia, 408 U.S. 238, 411 (1972) (Blackmun, J., dissenting) ("We should not allow our personal preferences as to the wisdom of legislative and congressional action in considering [the death penalty], or our distaste for [it], to guide our judicial decision in [capital] cases . . . .") *with, e.g.*, Callins v. Collins, 114 S. Ct. 1127, 1129 (1994) (Blackmun, J., dissenting from denial of cert.) ("Experience has taught us that the constitutional goal of eliminating arbitrariness and discrimination from the administration of death can never be achieved without compromising an equally essential component of fundamental fairness—individualized sentencing." (citation omitted)).

31. Baker, *supra* note 1, at 197 (quoting Edelman & Chen, *supra* note 2, at 83 (alterations in original)).

32. *Id.*

33. *Id.*

The difference between a median Justice and a swing Justice, especially on a Supreme Court that is fractured along numerous ideological fault lines, is the swing Justice's marginal propensity to defect from one winning coalition to another. A powerful Justice captures the subtle balance between being in the majority often and being sufficiently independent that the threat to defect is realistic and will therefore have some power to sway the decision. In other words, the difference between our view and Professor Baker's is the familiar difference between the dynamic and the static. Professor Baker asks how often a Justice appears in the fifth slot out of nine. By contrast, we measure a Justice's power by her ability and her inclination to move the Court toward her view of the law. Flexibility, not frequency, is the ultimate touchstone of power.

C. "TIME PRESENT AND TIME PAST . . ."

" . . . Are both perhaps present in time future, / And time future contained in time past."[34] We are frankly baffled by Professor Baker's final attack on our analysis. Supposedly our model rests on the assumption that "[p]redicting the [f]uture [i]s the [s]ame as [e]xamining the [p]ast."[35] To the charge that we use "complete information about the coalitions that formed during a particular past Term of the Supreme Court" in order "to predict that the [most powerful] Justice during some future Term will be the same," we plead guilty. Had we no interest in the Supreme Court's future behavior, we would be hard pressed to justify the time spent dissecting two Terms' worth of Supreme Court decisions. Fortunately, American law and legal institutions value the technique of using historical information to forecast the future.[36] If the use of past information to predict future behavior were altogether invalid, investment advisers and securities regulators would be wasting their time. Insurance would be meaningless. We have conducted "an experiment, as all life is an experiment."[37] Except perhaps in the Never-Never-Land of cooperative game theory, all

34. T.S. ELIOT, *Burnt Norton*, ll. 2-3, *in* FOUR QUARTETS 3, 3 (1943).

35. Baker, *supra* note 1, at 198.

36. *See, e.g.*, New York Trust Co. v. Eisner, 256 U.S. 345, 349 (1921) (Holmes, J.) ("a page of history is worth a volume of logic"); OLIVER WENDELL HOLMES, JR., THE COMMON LAW 1 (1902) ("The life of the law has not been logic: it has been experience."); Oliver Wendell Holmes, Jr., *The Path of the Law*, 10 HARV. L. REV. 457, 461 (1897) (defining law as "what the courts will do in fact, and nothing more pretentious").

37. Abrams v. United States, 250 U.S. 616, 630 (1919) (Holmes, J., dissenting).

of us routinely "wager our salvation upon some prophecy based upon imperfect knowledge."[38]

If Professor Baker simply complained that our index has limited predictive value, we might gladly concede the impact of her criticism. As a Danish courtesan reputedly said during a fencing match, "A hit, a very palpable hit."[39] The power pageant of the Justices would be a frivolous parlor game for Supreme Court watchers, and no more. But something is rotten in the state of game theory.[40] Describing the Supreme Court as a primitive "nine-member decisionmaking body operating under 'one member, one vote' and a simple majority decision rule," Professor Baker asserts that the Court offers "little to interest the student of voting systems."[41] It is hard to imagine a more explicit repudiation of our entire project.

In a moment of supreme irony, Professor Baker points to the alignment of Justices in *Romer v. Evans*[42] as evidence that her approach to Supreme Court power is superior to ours.[43] The happy coincidence that the six-Justice coalition in *Romer* included the most popular nominees for the Most Powerful Justice—Justices O'Connor, Kennedy, and Ginsburg—is beside the point. So is Professor Baker's presumption that we "would have advised the attorneys in *Romer* to focus their argnments . . . on Justice[s] Ginsburg . . . and Kennedy."[44] Either Professor Baker believes in using past cases to predict future vote alignments, or she doesn't. Nor does Professor Baker materially advance her cause by equating her analysis with Laurence Tribe's apparent litigation methodology,[45] which failed to garner five votes in *Bowers v. Hardwick*,[46] a hotly contested antecedent of *Romer*. Alas,

38. *Id.*

39. WILLIAM SHAKESPEARE, HAMLET, act 5, sc. 2, l. 285 (Tucker Brooke & Jack Randall Crawford eds., 1947).

40. *Cf. id.*, act 1, sc. 4, l. 90 ("Something is rotten in the state of Denmark.").

41. Baker, *supra* note 1, at 200; *see also id.* ("[A]ficianados of the Shapley-Shubik and Banzhaf indexes have shown little interest in studying the Supreme Court.").

42. 116 S. Ct. 1620 (1996) (Kennedy, J., joined by Stevens, O'Connor, Souter, Ginsburg & Breyer, JJ.).

43. *See* Baker, *supra* note 1, at 207.

44. *Id.* at 208 n.90. Far be it from us to give anyone legal advice. Neither of us is or ever expects to be an active member of the bar in any jurisdiction.

45. *See id.* at 208 & n.93.

46. 478 U.S. 186 (1986) (5-4 decision).

like others who rest too much of their legal scholarship on "story-telling" techniques,[47] Professor Baker has provided no concrete evidence that her account of *Romer* is representative of the 1995 Term or of Supreme Court decisionmaking generally. Such a shame, too, for we had such high hopes of infusing some empiricism and mathematical rigor into a field already replete with anecdote.[48]

At its worst, Professor Baker's criticism epitomizes the unfortunate reflex of established scientists to reject novel approaches to their subjects of study.[49] We could, of course, take solace in one of Max Planck's constants: "scientists never change their minds, but eventually they die."[50] We need not await a paradigmatic shift in positive political theory, however, for Professor Baker has not described the normal science of cooperative game theory, much less defended it. She apparently overlooks one of game theory's essential tasks, that of assigning values to players based on their contribution to various groups. The conundrum of Supreme Court voting, like virtually every other voting game, has an empty core and therefore lacks an obvious solution.[51] The Shapley value was designed to provide a solution to this sort of game.[52] No less than traditional game theorists, we have offered a "theoretical attempt[ ] to predict the future in the face of incomplete information."[53] We freely admit that we reject a single element of conventional game theory, the assumption that the voting institution in question is capable of assembling every theoretically possible coalition of voters. We thus go where few traditional cooperative game theorists have gone before. Novelty in pursuit of knowledge is no vice, and certainly no basis for criticizing our enterprise.

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47. *See, e.g.*, Daniel A. Farber & Suzanna Sherry, *Telling Stories Out of School: An Essay on Legal Narratives*, 45 STAN. L. REV. 807 (1993) (criticizing the use of narrative techniques in legal scholarship); Daniel A. Farber & Suzanna Sherry, *The 200,000 Cards of Dimitri Yurasov: Further Reflections on Scholarship and Truth*, 46 STAN. L. REV. 647 (1994) (same); Anne M. Coughlin, *Regulating the Self: Autobiographical Performances in Outsider Scholarship*, 81 VA. L. REV. 1229 (1995) (same).

48. *See* Edelman & Chen, *supra* note 2, at 65-66.

49. *See generally* THOMAS S. KUHN, THE STRUCTURE OF SCIENTIFIC REVOLUTIONS 77-91 (2d ed. 1970).

50. FREDERICK GRINNELL, THE SCIENTIFIC ATTITUDE 49 (2d ed. 1992) (attributing this saying to Max Planck).

51. *See generally* JOHN VON NEUMANN & OSKAR MORGENSTERN, THEORY OF GAMES AND ECONOMIC BEHAVIOR (1944); John von Neumann, *Zur Theorie der Gesellschaftsspiele* (*On the Theory of Games of Strategy*), 100 MATHEMATISCHE ANNALEN 295 (1928), *reprinted in* 4 CONTRIBUTIONS TO THE THEORY OF GAMES 13 (1959) (R.D. Luce & A.W. Tucker eds., 1959).

52. *See generally* THE SHAPLEY VALUE: ESSAYS IN HONOR OF LLOYD S. SHAPLEY (Alvin E. Roth ed., 1988).

53. Baker, *supra* note 1, at 199 (emphasis omitted).

III. RIPOSTE

A. THE MEDIAN IS NOT THE MESSAGE

Reduced to their bare essentials, all of Professor Baker's complaints stem from a single source. She seeks something that our model does not directly measure. Her quest, but not ours, is one for the Supreme Court's *median Justice*. "Who is the Court's 'most powerful' *or median* Justice?" she explicitly asks.[54] She assumes throughout her article that the median Justice is the Court's *swing Justice*. In a moment of epiphany, she even unites the two concepts: "'[F]or any ordering of the justices, the one ranked fifth is the pivot.' Case closed."[55]

Here Professor Baker delivers the thrust of cooperative game theory, and we shall stand firm in foiling her. It is by no means clear that the median Justice and the Most Dangerous Justice are the same. We thus come to the most interesting point of disagreement between us and Professor Baker. We are ultimately concerned with each Justice's ability to deliver a "swing" vote, not with a Justice's distance from the Court's ideological core over a range of issues. In short, the median is not the message.

One passage exposes with particular clarity the depth of Professor Baker's allegiance to the median voter theorem. She champions the "critical fact that the Justice who stands at the 'margin' *of two groups* of her colleagues necessarily stands at the Court's center."[56] There is but one possible interpretation of this assertion. Professor Baker envisions the Justices' preferences in a single dimension. She imagines that the Justices are arrayed along a line like so many real numbers and that a vote divides them into two groups.[57] In this most simplistic of circumstances, the median Justice is the most powerful Justice. If we add but an iota of greater sophistication, however, Professor Baker's linear model would prove untrue.

Far from being a foregone conclusion, the median voter theorem is hotly contested among positive political theorists. The numerous empirical attempts to test the theorem have yielded very mixed results.[58] Others have launched theoretical attacks on the theorem.[59]

54. *Id.* at 190 (emphasis added).

55. *Id.* at 200 (citation omitted).

56. *Id.* at 201 (emphasis in original).

57. *See* DAVID BERLINSKI, A TOUR OF THE CALCULUS 42-43 (1995) (using a line-cutting metaphor to describe German mathematician Richard Dedekind's analysis of continuity and irrational numbers).

58. *See* DENNIS C. MUELLER, PUBLIC CHOICE II, at 189-93 (1989).

Unfortunately, Professor Baker is silent on these matters. Although we will spare the reader many of the technical details (and in so doing spare ourselves an unwanted burden), we will recall what the classic median voter theorem actually says. We follow the presentation of Dennis Mueller.[60] The two key assumptions of the median voter theorem are that

(1) Issues are defined along a single dimensional vector x, and
(2) Each voter's preferences are single-peaked in that one dimension.

Under these hypotheses we conclude:

The Median Voter Theorem. If x is a single-dimensional issue, and all voters have single-peaked preferences defined over x, the x_m (the median position) cannot lose under majority rule.

These two hypotheses impose severe constraints on the median voter theorem. Before applying the theorem to the Supreme Court, one must ensure that both of these conditions hold. We believe that neither does. It verges on the unsporting to name a multidimensional Supreme Court controversy. We need not torture the reader with excruciating, paragraph by paragraph parsing of opinions such as *Denver Area Educational Telecommunications Consortium, Inc. v. FCC*.[61] Consider instead *Rosenberger v. Rector & Visitors of the University of Virginia*.[62] A majority of five condemned what it perceived as viewpoint discrimination in a public university's refusal to fund a religious student publication.[63] A minority of four countered that the refusal was justified by the university's compelling interest in obeying the Constitution's establishment clause.[64] On that assumption the dissenters then rejected the Court's free speech analysis.[65] Did *Rosenberger* turn on a free speech axis, an establishment clause axis, or a single axis

59. *See, e.g.*, ALBERTO ALESINA & HOWARD ROSENTHAL, PARTISAN POLITICS, DIVIDED GOVERNMENT AND THE ECONOMY (1995); Daniel Ingberman & John Villani, *An Institutional Theory of Divided Government and Party Polarization*, 37 AM. J. POL. SCI. 429 (1993).

60. *See* MUELLER, *supra* note 58, at 65-66. We confine our discussion to the one-dimensional variant of the median voter theorem. There are results for higher dimensions, but they are more complicated and less conclusive. Although the hypotheses under which they apply are more technical, many of the constraints that limit the theorem in our situation are applicable to the higher-dimension variants of the theorem. *See id.* at 73-74.

61. 116 S. Ct. 2374 (1996).

62. 115 S. Ct. 2510 (1995). The obviousness of this choice is suggested by the fact that the mathematician among us, and not the law professor, was the one who picked the case.

63. *See id.* at 2516-25 (majority opinion of Kennedy, J.).

64. *See id.* at 2533-47 (Souter, J., dissenting).

65. *See id.* at 2547-51.

fusing the two constitutional considerations? Can any educated observer of the Court draw any firm conclusions? Like most of the Court's cases, *Rosenberger* required the Justices to identify issues along multiple dimensions and to balance their jurisprudential and political preferences along several axes. To apply the median voter theorem under such conditions is, to say the least, somewhat troublesome.

The second prerequisite for applying the median voter theorem to Supreme Court decisionmaking is even more elusive. To assume that each Justice's preferences are single-peaked in a single dimension, as Professor Baker implicitly does, is effectively to ignore a mountain of legal scholarship contesting this very premise.[66] So many issues, so many preferences, so few votes. The positive political theory that defines Supreme Court decisionmaking is Arrow's Impossibility Theorem,[67] not the single-peaked coherence theorems of Black and Sen.[68] "The hope that" the Supreme Court might follow the elementary rules of public choice theory "is a part of a system of childish illusions that dominates elementary [political science]; it is here, when" the intractable complexity of game theory "is grasped, that like first love elementary [political science] passes into memory."[69]

66. *See, e.g.*, Frank H. Easterbrook, *Ways of Criticizing the Court*, 95 HARV. L. REV. 802 (1982); Lewis A. Kornhauser & Lawrence G. Sager, *The One and the Many: Adjudication in Collegial Courts*, 81 CAL. L. REV. 1 (1993); Lewis A. Kornhauser & Lawrence G. Sager, *Unpacking the Court*, 96 YALE L.J. 82 (1986); David Post & Steven C. Salop, *Rowing Against the Tidewater: A Theory of Voting by Multijudge Panels*, 80 GEO. L.J. 743 (1992); John M. Rogers, *"I Vote This Way Because I Am Wrong": The Supreme Court Justice as Epimenides*, 79 KY. L.J. 439 (1990-91); John M. Rogers, *"Issue Voting" by Multimember Appellate Courts: A Response to Some Radical Proposals*, 49 VAND. L. REV. 997 (1996); Maxwell L. Stearns, *How Outcome Voting Promotes Principled Issue Identification: A Reply to Professor John Rogers and Others*, 49 VAND. L. REV. 1045 (1996); Maxwell L. Stearns, *The Misguided Renaissance of Social Choice*, 103 YALE L.J. 1219 (1994); Maxwell L. Stearns, *Standing Back from the Forest: Justiciability and Social Choice*, 83 CAL. L. REV. 1309 (1995); Maxwell L. Stearns, *Standing and Social Choice: Historical Evidence*, 144 U. PA. L. REV. 309 (1995); *cf.* Jim Chen, *The Mystery and the Mastery of the Judicial Power*, 59 MO. L. REV. 281, 302-06 (1994) (showing how Justice Scalia alone managed to reveal multipeaked preferences over time on a single issue—the legal viability of prospective adjudication).

67. *See* Kenneth J. Arrow, *A Difficulty in the Concept of Social Welfare*, 58 J. POL. ECON. 328 (1950).

68. *See* DUNCAN BLACK, THEORY OF COMMITTEES AND ELECTIONS (1958); Amartya K. Sen, *A Possibility Theorem on Majority Decisions*, 34 ECONOMETRICA 491 (1966).

69. BERLINSKI, *supra* note 57, at 239.

B. MEDITATIONS ON A MODIFIED MEDIAN

Ah, but what romance lurks in the hearts of men? Let no one accuse us of unregenerate realism. From the shadows of our reply, we are willing to indulge Professor Baker's arguably quixotic supposition that the median voter theorem applies to the Supreme Court. True, we do not happily abandon the project of identifying feasible five- and four-Justice coalitions, for each Justice's marginal ability to pose a credible threat of defection is a significant component of Supreme Court voting power. We will nevertheless consider a power index based solely on the median Justice.

We do dispute one aspect of Professor Baker's methodology. In building her own "Standard Measure" of the Justices' voting power, Professor Baker "simply . . . count[s] the number of times each Justice was a member of a winning coalition of *any* size."[70] Though blessed with simplicity, this approach suffers from two flaws, one minor and one major. The minor flaw flows from Professor Baker's decision to count submajority decisions. On the Court, four is the loneliest number; for the most part, we are uninterested in coalitions that lack the strength to control legal reasoning. There is a simple fix, of course: ignore all coalitions smaller than five.

The major flaw in Professor Baker's methodology lends itself to an equally easy fix. By counting multiple instances of each coalition, Professor Baker reinforces what we call the "docket bias" inherent in each Term's decisions. As we noted in *The Most Dangerous Justice*, each Term's docket takes on the flavor of certain leading cases.[71] The prevalence of a particular strain of cases—say, federalism disputes—will tilt the balance of power on the Court toward the Justice or Justices who hold pivotal positions on the dominant issue.

Though inevitable, docket bias need not be fortified. A single Term's docket is already a limited cross-selection of the vastly more diverse workload that confronts the Court over a period of years. Counting repeated instances of a particular 5-4 division on the Court boosts the power ratings of the Justices who command that majority,

70. Baker, *supra* note 1, at 202 (emphasis in original); *see also id.* at 192 ("[I]n order to answer the question of who the [median] most powerful Justice was during a particular past Term of the Court, game theory suggests that one must simply count up the number of times that each Justice was a member of the winning coalition.").

71. *See* Edelman & Chen, *supra* note 2, at 97.

but it provides no additional information about the Court's deep coalitional structure. The only information relevant to this query is the number of *different* winning coalitions.

We will therefore count the number of different winning coalitions—defined as coalitions of five or more—that each Justice joined in October Term 1994, October Term 1995, and the two Terms counted together. Our "median Justice" ratings follow:

TABLE 3.1: MEDIAN JUSTICE POWER RATINGS, 1994 TERM

Justice	5	6	7	8	9	Total	Index	Quotient
CJ	7	9	3	5	1	25	12.3	110
JPS	7	6	3	4	1	21	10.3	93
SOC	5	7	3	4	1	20	9.8	88
AS	4	8	3	4	1	20	9.8	88
AMK	9	10	3	5	1	28	13.7	126
DHS	6	9	3	5	1	24	11.8	106
CT	4	5	2	4	1	16	7.8	71
RBG	8	10	4	4	1	27	13.2	119
SGB	5	8	4	5	1	23	11.3	101

TABLE 3.2: MEDIAN JUSTICE POWER RATINGS, 1995 TERM

Justice	5	6	7	8	9	Total	Index	Quotient
CJ	3	5	7	3	1	19	10.3	93
JPS	4	5	5	2	1	17	9.2	83
SOC	6	4	9	3	1	23	12.5	113
AS	4	5	6	2	1	18	9.8	88
AMK	5	7	8	3	1	24	13.0	117
DHS	6	7	8	3	1	25	13.6	122
CT	3	4	6	2	1	16	8.7	78
RBG	5	6	8	3	1	23	12.5	113
SGB	4	5	6	3	1	19	10.3	93

TABLE 3.3: MEDIAN JUSTICE POWER RATINGS, 1994 AND 1995 TERMS

Justice	5	6	7	8	9	Total	Index	Quotient
CJ	9	11	9	5	1	35	11.8	106
JPS	8	9	6	4	1	28	9.5	85
SOC	8	9	10	4	1	32	10.8	97
AS	6	12	8	4	1	31	10.4	94
AMK	11	13	9	5	1	39	13.2	119
DHS	9	12	9	5	1	36	12.2	109
CT	6	8	8	4	1	27	9.1	82
RBG	10	12	10	4	1	37	12.5	113
SGB	7	10	8	5	1	31	10.5	94

The most striking visual difference between our median Justice power ratings and Professor Baker's "standard measure" is the numerical shift from 9-0 decisions toward nonunanimous decisions. Professor Baker's tables counted each of the 26 unanimous decisions in the 1994 Term and each of the 37 unanimous decisions in the 1995 Term. By contrast, we credited each Justice with exactly one "point" for his or her participation in the single grand coalition of all Justices. In practical terms, little harm flows from Professor Baker's overcount of 9-0 decisions; every Justice receives an equal amount of credit. In her index and ours alike, the key lies instead in an effective assessment of the nonunanimous decisions. Our measure stresses the divided decisions that are likelier to generate a greater number of different coalitions and thereby to disclose differences in voting power among the Justices.

Modified to minimize docket bias and to highlight each Justice's range in building different coalitions, the median Justice measure comes reasonably close to our basic power indexes. The top four finishers in our combined power pageant for the 1994 and 1995 Terms—Justices Ginsburg, Keunedy, and Souter and Chief Justice Rehnquist—score power quotients above 100 in a measure designed

to identify the median Justice. All of these Justices also fare reasonably well in Professor Baker's "standard measure."

The chief outliers are Justices O'Connor and Ginsburg. Justice Ginsburg tops our principal power index and places second in our median Justice index, but finishes a mediocre fifth in Professor Baker's standard measure. Conversely, Justice O'Connor ranks second in Professor Baker's eyes, but votes below par power in our median Justice index and finishes in a dismal tie for seventh with Justice Scalia in our most sophisticated power index. The probable explanation lies in the unspoken difference between Professor Baker's objective and ours. By crediting Justice O'Connor with each case decided by coalitions to which she belonged, Professor Baker implicitly accepts the premise that the strength of a coalition may be directly measured by the number of decisions it renders. We, on the other hand, emphasize the number of unique coalitions that a Justice has joined, adhering to the belief that range in coalition-building is the best measure of a Justice's voting power. The number of decisions rendered is a function of the Supreme Court's fickle docket.

One final observation on the median Justice measure bears notice. Justice Kennedy was the consistent winner of the median Justice measure; he finished first in the 1994 Term, a very close second in the 1995 Term, and first overall during the two Terms combined. There is no reason, however, to believe that Justice Kennedy is the Court's median Justice, that he sits on the Court's ideological midpoint. That distinction probably belongs to a more ideologically moderate colleague. Consider the following arrangement of Justices by ideology—an admittedly subjective but eminently defensible array moving from most liberal on the left to most conservative on the right—paired with their scores in the median Justice derby:

JPS	SGB	DHS	RBG	SOC	AMK	CJ	AS	CT
8	(7)	3	2	5	1	4	(6)	9

(Note that Justices Scalia and Breyer actually tied for sixth. We have assigned Justice Scalia to sixth place and Justice Breyer to seventh for our own manipulative purposes.)

This arrangement not only achieves an elegant symmetry; it also suggests something about the distribution of power in an ideologically divided voting body. If in fact the Justices can be arranged along a single ideological axis, and if the particular arrangement we have chosen is accurate, the evidence from the 1994 and 1995 Terms allows

us to form certain hypotheses about the relationship between ideology and voting power. The ideologically median Justice is not the one who appears in the highest number of different coalitions. Rather, Justice O'Connor, who is the consensus pick for the Court's ideological center of gravity, is poised at the midpoint of the Court's power, not its apex. The true power voters flank her on the immediate right and left, Justices Kennedy and Ginsburg respectively. Voting power then fans out in a progressively declining fashion as one moves toward the ideological fringes, skipping over the median power position that is held by the Court's consummate centrist. Although further speculation would be premature, one of us has made theoretical observations on power in an ideologically divided voting body that are consistent with this empirical evidence regarding the Court's median Justice.[72]

This application of the median voter theorem to the Supreme Court vividly demonstrates the power of our methodology for identifying the Most Dangerous Justice. There is no way to determine whether Supreme Court controversies can be analyzed along a single ideological dimension, much less whether the Justices' preferences along that dimension are single-peaked. We therefore lack the factual bases for concluding that the median voter theorem governs the Court. On the other hand, we can rank the Justices not only by voting power, but also by their ideological distance from the median. The existence of these explicit and independent measures allow us to test directly the validity of the median voter theorem.

We stand firm in our resolve to infuse mathematical rigor into the study of Supreme Court voting. Let our critics inveigh and the law's beguilers inveigle as they will; their cries are uttered in vain. We will heed instead the symphony[73] of beckoning sounds and thoughts that springs from "elaborate mathematics."[74]

72. *See generally* Paul H. Edelman, *A Note on Voting*, MATH. SOC. SCI. (forthcoming 1997).

73. *Hear* Diana Ross & The Supremes, *I Hear a Symphony* (BMI 1964), *on* 16 #1 HITS FROM THE EARLY 60's (Motown 1987); *hear also* Dire Straits, *Sultans of Swing*, *on* DIRE STRAITS (Phonogram Ltd. 1978) ("[N]ot too many horns can make that sound"). *See generally* Jim Chen, *Rock 'n' Roll Law School*, 12 CONST. COMMENTARY 315 (1995).

74. *But cf.* Baker, *supra* note 1, at 4.