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IN THE UNITED STATES DISTRICT COURT
FOR THE MIDDLE DISTRICT OF PENNSYLVANIA

RICHARD VIETH, NORMA JEAN VIETH, and SUSAN FUREY,	)	
Plaintiffs,	)	
v.	)	No. 1: CV 01-2439 Judge Rambo, Judge Yohn, Judge Nygaard
THE COMMONWEALTH OF PENNSYLVANIA; MARK S. SCHWEIKER, *et al.*,	)	
Defendants.	)	

PLAINTIFFS' MEMORANDUM IN OPPOSITION TO DEFENDANTS' MOTION TO EXCLUDE EXPERT TESTIMONY BY DR. ALLAN LICHTMAN

Plaintiffs submit this response to Defendants' motion to exclude the statistical analysis and expert testimony of Professor Allan Lichtman.[1] Professor Lichtman's basic conclusion is that the Act 1 map is strongly skewed in favor of the Republicans because it isolates a large number of Democratic voters into five of 19 districts, while drawing the other 14 districts with a majority of Republican voters. Plaintiffs in this brief address only Defendants' argument that his analysis supporting this conclusion is not sufficiently reliable to be admitted at trial. They do not address the issue of

[1] Plaintiffs will respond to Defendants' motion to exclude testimony by their other expert, Larry Ceisler, by February 27, 2002.

relevance, which the Court can address once it is clear what issues will be considered at trial.[2]

Simply stated, Defendants have not come close to the kind of showing that would be required to render Professor Lichtman's analysis inadmissible. To the contrary, the fact that they filed the motion only illuminates the quandary they face and the strategy they have adopted in seeking to defend the constitutionality of an extraordinarily biased congressional districting map. Defendants cannot produce any statistical analysis because that would only serve to buttress Plaintiffs' case. Accordingly, they attempt to prevent all statistical testimony on the effects of the new district lines by offering criticisms of Professor Lichtman's analysis that, at most, ought to be the subject of their cross-examination of him.

Expert testimony is admissible under Federal Rule of Evidence 702 if it meets three requirements: (1) it is offered by a qualified expert, (2) the process or technique the expert used in formulating the opinion is reliable, and (3) the expert's testimony is sufficiently relevant to the case that it assists the trier of fact. *In re Paoli R.R. Yard PCB Litig.*, 35 F.3d 717, 741-43 (3d Cir. 1994). Defendants' argument centers primarily on the second requirement, concerning the reliability of the expert testimony. In *Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579 (1993), and *Kumho Tire Co.*

[2] Plaintiffs have filed a motion for clarification and/or reconsideration of the Court's ruling on the motion to dismiss. If granted, that motion would leave in place Plaintiffs' claims of partisan gerrymandering in violation of Article I of the U.S. Constitution. Even if the case is ultimately limited to a one-person, one vote claim, Professor Lichtman's analysis is still relevant to the question whether the Defendants can offer a legitimate justification for the line-drawing decisions that led to a 19-person population deviation.

v. Carmichael, 526 U.S. 137, 152 (1999), the Supreme Court elaborated the standards a judge should use in evaluating whether proffered testimony satisfies that requirement. In keeping with the liberal thrust of the Federal Rules of Evidence, a judge should find expert testimony sufficiently reliable under Rule 702 if it is based on "good grounds" – that is, if it is based on reliable methodology. *Paoli*, 35 F.3d at 744. As Defendants recognize, under *Daubert*, plaintiffs "do not have to demonstrate to the judge by a preponderance of the evidence that the assessments of their experts are correct, they only have to demonstrate by a preponderance of evidence that their opinions are reliable." *Id.* at 744. Although Defendants have adequately summarized the governing criteria with respect to the reliability requirement, they then apply those criteria in a manner that is indefensible.

First, as to the qualifications of Professor Lichtman, he is one of the leading experts in the country in the field of quantitative analysis of political systems including district maps. Lichtman Dep. at 5-8 (attached as Exh. A). He is a tenured professor at American University and the author of numerous books and articles in this field. *See* Dr. Lichtman's resume (attached as Exh. C). Moreover, his testimony in cases involving claims of dilution of the voting power of political or racial groups has been accepted and relied on by literally *dozens* of other courts. *See Johnson v. Mortham*, 926 F. Supp. 1460, 1474 (N.D. Fla. 1996) (describing Dr. Lichtman as "a veteran of Voting Rights Act litigation"); *LULAC v. North East Indep. Sch. Dist.*, 903 F. Supp. 1071, 1081 (W.D. Tex. 1995) (describing Dr. Lichtman

as a "recognized expert[] in the field of racially polarized voting"); *Johnson v. Miller*, 864 F. Supp. 1354, 1388 (S.D. Ga. 1994), *aff'd*, 515 U.S. 900 (1995) (describing Dr. Lichtman as a "veteran[] of the *Shaw* litigation circuit"); *Marylanders for Fair Representation, Inc. v. Schaefer*, 849 F. Supp. 1022, 1056 n.54 (D. Md. 1994) (describing Dr. Lichtman as "a renowned authority on the Voting Rights Act and the author of the only statistical textbook devoted exclusively to ecological regression"); *Texas v. United States*, 802 F. Supp. 481, 486 (D.D.C. 1992) (describing Dr. Lichtman as an "expert[] in data analysis and redistricting"); *Garza v. County of Los Angeles*, 756 F. Supp. 1298, 1331 (C.D. Cal. 1990) (noting that, as of 1990, Dr. Lichtman "has been recognized as an expert witness in bloc voting, political systems, and quantitative and socioeconomic analysis, among other matters, in more than 15 federal court cases"); *McNeil v. City of Springfield*, 658 F. Supp. 1015, 1028 (C.D. Ill. 1987) (describing Dr. Lichtman as "a nationally recognized expert in the use of ecological regression analysis"); *Jordan v. City of Greenwood*, 599 F. Supp. 397, 402 (N.D. Miss. 1984) (describing Dr. Lichtman as "an expert in the history of voting and the methodology for inferring voter behavior from election returns and demographic information"), *vacated on other grounds*, 711 F.2d 667 (5th Cir. 1983); *see also Houston v. Lafayette County*, 56 F.3d 606, 612 (5th Cir. 1995); *United States v. Dallas County Comm'n*, 850 F.2d 1433 (11th Cir. 1988); *Barnett v. City of Chicago*, 969 F. Supp. 1359, 1423 (N.D. Ill. 1997), *aff'd in part, vacated in part*, 141 F.3d 699 (7th Cir. 1998);

Vecinos de Barrio Uno v. City of Holyoke, 926 F. Supp. 23, 27 (D. Mass. 1996); *Jenkins v. Red Clay Consol. Sch. Dist. Bd. of Educ.*, No. 89-230, 1996 WL 172327 (D. Del. Apr. 10, 1996), *aff'd*, 116 F.3d 685 (3d Cir. 1997); *Vecinos de Barrio Uno v. City of Holyoke*, 880 F.Supp. 911, 912 (D. Mass. 1995), *vacated on other grounds*, 72 F.3d 973 (1st Cir. 1995); *Smith v. Board of Sup'rs of Brunswick County*, 801 F. Supp. 1513, 1522 n.11 (E.D. Va. 1992), *rev'd on other grounds*, 984 F.2d 1393 (4th Cir. 1993). In asking the Court to bar Professor Lichtman's testimony, Defendants are asking the Court to ignore the overwhelming judicial recognition accorded to his expertise.

Second, the analysis presented by Professor Lichtman is both utterly conventional and very easy to understand. He starts with the principle that in a fair district map, if one political party receives 50 percent of the votes statewide, it should have a majority of the vote in 50 percent of the districts. Any significant deviation from this principle would show that voters who support one party have been unfairly "packed" and "fractured" so that the value of their votes has been "diluted." Here, using votes for statewide candidates during the 1990s as the benchmark, Professor Lichtman determined that the effect of the district lines was to transform 50 percent of the vote for Democrats statewide into control of only 5 of 19 very "packed" Democratic-leaning districts. *See* Lichtman Dep. at 28-36 (attached as Exh. A); and Table 1 (Exh. 1 to Lichtman Dep., attached as Exh. B).

This kind of seats/votes relationship is the essence of what every expert studies when analyzing partisan bias in a district map. That is made clear in a number of scholarly articles that Professor Lichtman was able to cite at his deposition, *see* Lichtman Dep. at 54-57, including the very articles cited in Defendants' brief. For example, as Defendants' own expert, Professor Brunell, stated in a 1997 article he co-authored, "All methods of calculating partisan bias have in common the need to specify each party's national share of the (two-party) vote as a baseline for calculating a seats-votes relationship from which bias is estimated." Bernard Grofman, William Koetzle & Thomas Brunell, *An Integrated Perspective on the Three Potential Sources of Partisan Bias: Malapportionment, Turnout Differences, and the Geographic Distribution of Party Vote Shares*, 16 Electoral Studs. 457, 461 (1997) (Exh. 2 to Brunell Dep., attached as Exh. E).[3]

At his deposition, Professor Brunell primarily criticized Professor Lichtman for using 19 "statewide" election returns – elections for Governor, Senator and other statewide offices – to categorize and analyze the new congressional districts, rather than prior congressional election results under the prior district map. He advocated use of congressional election data and a complicated software package called "JudgeIt," which can predict election results in new districts based on inputs concerning prior elections. But Professor Lichtman's reliance on statewide election returns is amply

[3] The article referred to a "national share of the (two-party) vote as a baseline" because it was discussing analysis of a nationwide set of districts – such as all districts for U.S. House seats.

supported in the professional literature he cited at his deposition. *See, e.g.*, Charles Backstrom, Leonard Robins & Scott Eller, *Issues in Gerrymandering: An Exploratory Measure of Partisan Gerrymandering Applied to Minnesota*, 62 Minn. L. Rev. 1121, 1127-28, 1133 (1978) (advocating the use of statewide election returns); *see also* Bruce E. Cain, *The Reapportionment Puzzle* 139-41 (1984) (discussing the method of using of statewide election returns); Cain, *Assessing the Partisan Effects of Redistricting*, 79 Am. Pol. Sci. Rev. 320, 322-23 n.1 (1985) (noting the validity of the method of using statewide election returns). Moreover, despite Professor Brunell's criticism of Professor Lichtman's approach, Brunell also conceded that he recently used precisely the same method of analysis when he testified in a Texas redistricting case that a Republican-proposed congressional map was not infected with partisan bias. As Brunell testified in his deposition in this case:

> You could, and Professor Lichtman has, look at how statewide elections break down into individual congressional districts. The utility of doing that is that you control for differing factors and differing races like incumbency, quality of candidates, campaign finance, things of that nature. So it gives you, without trying to control for these other variables, you can do a simple analysis of how statewide elections break down into these different districts. *In fact, I have done that previously.*

Brunell Dep. at 22-23 (attached as Exh. D) (emphasis added); *see id.* at 26, 28.

In the Texas expert report to which Professor Brunell was referring ("In fact, I have done that previously"), he responded to an expert who had used congressional election data and Judgeit, saying, "Instead of using Congressional election results, which have complications of incumbency and variance across races in terms of campaign finance, candidate quality, and a whole host of other variables, *I used statewide election results to calculate the relationship between seats and votes*." *Supplemental Analysis of Partisan Bias*, at 2 (Exh. 1 to Brunell Dep., attached as Exh. F) (emphasis added). Thus, just like Professor Lichtman, Professor Brunell in Texas compared the overall percentages of the vote in statewide elections with the number of proposed congressional districts carried by the statewide candidates to see if the two match up. As he explained in his Texas report,

> if the two parties split the vote 50-50, they [should] also each get 50 percent of the seats. The political science literature refers to deviations from this ideas as 'partisan bias.' If a party gets 55 percent of the seats and only 45 percent of the votes (which means the other party get a majority of the votes and less than a majority of the seats) then the plan is not fair to each of the parties."

Id. at 3.

Professor Brunell also testified at his recent deposition that if Professor Lichtman was going to rely on statewide election returns, he should have checked on how well those elections returns correlated with congressional election returns in Pennsylvania in the past – *i.e.*, whether

areas that tended to vote Democratic in statewide elections also tended to vote Democratic in congressional elections. Brunell Dep. at 39 (attached as Exh. D). But Professor Brunell was unable to recall whether he ran such a correlation analysis in Texas, *id.*, and his Texas report does not so indicate. Nor did he identify any reason to doubt that there is a strong relationship between votes for statewide officeholders and votes for congressional candidates of the same party in Pennsylvania.[4]

Finally, Professor Brunell criticized the particular subset of statewide elections chosen by Professor Lichtman, which was all statewide elections in even-numbered years from 1992 to 2000, plus the special election for U.S. Senate in 1991. But Professor Lichtman explained that the statewide elections he omitted – odd-year elections for judicial offices – would have very different turnout rates and patterns than elections in which candidates for Congress are on the ballot. Lichtman Dep. at 19 (attached as Exh. A). Professor Brunell again had done no analysis to support the implausible assumption that the particular selection of date made by Professor Lichtman made a whit of difference.

There can be little doubt that Professor Lichtman's testimony satisfies the final requirement of Rule 702 – that is, that it will assist this Court in determining the issues in this case. Professor Lichtman's testimony bears directly on the issues at stake. But even if there were some question as to

[4] Professor Lichtman subsequently ran the analysis – as Professor Brunell had not – and confirmed that there is indeed a very high correlation between the two.

the reliability of his conclusions, or the "fit" between his conclusions and the case at hand, the proper response would hardly be to exclude Professor Lichtman's testimony before it has been presented. The purpose of the court's "gatekeeping" function under *Daubert* is to ensure that the expert's testimony "[is] sufficiently reliable so that it will aid the jury in reaching accurate results." *Paoli*, 35 F.3d at 744 (internal quotation marks omitted). In a bench trial, where the court is at once the "gatekeeper" and the finder of fact, the gatekeeping function is far less essential. *Gibbs v. General Am. Life Ins. Co.*, 210 F.3d 491, 500 (5th Cir. 2000); *Magistrini v. One Hour Martinizing Dry Cleaning*, No. CIV.A.96-4991, 2002 WL 27318, at *n.10 (D.N.J. Jan. 4, 2002); *Volk v. United States*, 57 F. Supp. 2d 888, 896 n.5 (N.D. Cal. 1999); *Ekotek Site PRP Comm. v. Self*, 1 F. Supp. 2d 1282, 1296 n.5 (D. Utah 1998).

Rather than exclude expert evidence before it is presented, courts have found that the "better approach" in a bench trial is for the court to admit the testimony of qualified experts and "allow '[v]igorous cross-examination, presentation of contrary evidence' and careful weighing of the burden of proof to test 'shaky but admissible evidence.'" *Fierro v. Gomez*, 865 F. Supp. 1387, 1396 n.7 (N.D. Cal. 1994) (quoting *Daubert*, 509 U.S. at 596). Although courts may only rely on admissible and reliable evidence in making their rulings, they should determine reliability after they have heard the evidence, rather than excluding crucial evidence before the trial has even begun. *Cf. Gonzales v. Nat'l Bd. of Med. Examiners*, 225 F.3d 620, 635 (6th

Cir. 2000) (Gilman, J., dissenting) ("[D]istrict courts conducting bench trials have substantial flexibility in admitting proffered expert testimony at the front end, and then deciding for themselves during the course of the trial whether the evidence meets the requirements of *Kumho Tire Co.* and *Daubert* and deserves to be credited."); *see also Ekotek Site PRP Comm. v. Self*, 1 F. Supp. 2d 1282, 1296 n.5 (D. Utah 1998) (reserving a pretrial *Daubert* motion for the close of trial).

In sum, it is hard to imagine a weaker argument for exclusion of expert testimony than that presented here. Defendants have not even attempted to rebut the basic facts that led Professor Lichtman to draw his conclusions – *i.e.*, that Democratic voters in statewide elections are so concentrated into a small number of districts under Act 1 that Democratic candidates, who have averaged 50 percent of the vote statewide, would have carried, on average, only 5 of the 19 new districts. There might some debate about reliance on those facts, without more, in a case that was close to the line, but here the evidence of severe bias is compelling. In fact, the Texas experience suggests that if Plaintiffs had hired Professor Brunell as their expert, he would have done an analysis remarkably similar to that of Professor Lichtman, and would have reached precisely the same conclusion.

CONCLUSION

For the foregoing reasons, the motion to exclude Professor Lichtman's expert testimony as unreliable should be denied.

Respectfully submitted,

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Dated: February 26, 2002

A

February 15, 2002

Dr. Allan Lichtman Washington, DC

IN THE UNITED STATES DISTRICT COURT
FOR THE MIDDLE DISTRICT OF PENNSYLVANIA

- - - - - - - - - - - - - - - - - X

RICHARD VIETH, NORMA JEAN VIETH, and SUSAN FUREY,

Plaintiff,

v. : Case No. 1:CV-01-2439

COMMONWEALTH OF PENNSYLVANIA, et al.,

Defendants.

- - - - - - - - - - - - - - - - - X

Washington, D.C.

Friday, February 15, 2002

Deposition of ALLAN LICHTMAN, a witness herein, called for examination by counsel for Defendants Lieutenant Governor Jubelirer and Speaker Ryan, in the above-entitled matter, pursuant to notice, the witness being duly sworn by CYNTHIA R. SIMMONS, a Notary Public in and for the District of Columbia, taken at the offices of Kirkpatrick & Lockhart LLP, 1800 Massachusetts, Suite 200, Washington, D. C., at 9:00 a.m., Friday, February 15, 2002, and the proceedings being taken down by Stenotype by CYNTHIA R. SIMMONS, RMR, CRR, and transcribed under her direction.

Dr. Allan Lichtman

February 15, 2002

Washington, DC

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CLARK BENSEN
THOMAS BRUNELL

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EXHIBITS

PROCEEDINGS

Whereupon,
ALLAN LICHTMAN,
was called as a witness by counsel for Defendants, and having been duly sworn by the Notary Public, was examined and testified as follows:

EXAMINATION BY COUNSEL FOR DEFENDANTS

BY MR. KRILL:

Q. State your name, please?
A. Allan J. Lichtman.
Q. And it's Dr. Lichtman, right?
A. Yes.
Q. Your counsel has provided me with your curriculum vitae, Dr. Lichtman, and so I'm not going to go into that. Let me just ask, how are you this morning?
A. I'm doing just fine, I hope you are too.
Q. Thank you, yes. We're all doing our best to hold up under the frenetic pace of these proceedings.
MR. SMITH: You're writing too many pages. You have to slow down.

BY MR. KRILL:

Q. Now, Dr. Lichtman, for the purposes of this case, how do you define your field of expertise?

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A. My field of expertise has to do with quantitative methodology, political history, analysis of political systems, voting rights.
Q. Now you said that your expertise has to do with those things. Are you, do you consider yourself an expert in each of those four areas that you've enumerated?
A. Yes.
Q. All right. The first area is that, that you mentioned is quantitative methodology?
A. Yes.
Q. What is that?
A. That's a methodology used for the statistical analysis of social science information and in particular for this matter, the analysis of political information. I have published a number of articles as well as a monograph in that area.
Q. And you're familiar with a number of quantitative methods --
A. Yes.
Q. -- for analyzing political systems?
A. Yes.
Q. And you said your expertise is also in political history?
A. That's correct.

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Q. Are you appearing in this matter as a political historian?
A. Only in the broadest sense that what one is looking at is electoral history. If you're asking me have I been asked to look at the political history of Pennsylvania or Pennsylvania redistricting to this point, no, although one never knows what lawyers may ask you to do.
Q. And you said your expertise has to do with the analysis of political systems, would you explain that, please?
A. Yes, I've had extensive experience in analyzing various systems for the election of public officials, at large systems, district systems, various districting plans.
Q. For what purpose?
A. I'm sorry, I don't understand the question.
Q. For what purpose do you analyze such systems?
A. You can analyze them for numerous purposes. You can analyze them in terms of the opportunities they provide for minorities to participate fully in the political process and to elect candidates of their choice. You can analyze

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them in terms of how they treat political parties in terms of the, in terms of their opportunities. One analysis I'm doing has to do with the analysis of unincorporated versus incorporated areas within a jurisdiction. There are numerous purposes for which you can analyze political systems.
Q. And the fourth area that you mentioned is voting rights, are you an expert in voting rights law?
A. No, but what I have written on in a number of articles is the application of social science to voting rights.
Q. You have been called a quantitative historian, haven't you?
A. Yes.
Q. What does that mean?
A. That means I apply a mathematical and statistical methods to understanding history.
Q. That doesn't mean, does it, that you apply mathematical and statistical methods to predict history?
A. To predict the past? You mean retrodict the past, I have done that.
Q. No to predict history, I mean that is to predict future events?

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A. I have used mathematical models based on history to predict future events, yes.
Q. Yes. Can you give me some examples of your predictions?
A. Yes. I've published a number of books starting with the 13 keys to the presidency and most recently the keys to the White House which examine the broad sweep of American political history roughly from the 1850s to the present to determine whether or not there are patterns in presidential elections, particularly whether there are patterns in whether or not the incumbent party retains or does not retain the White House and I've tried to some degree to quantify those patterns by developing what I call the 13 keys, simple yes/no questions that can indicate whether or not the situation favors a popular vote victory by the incumbent party or the challenging party.
Q. Well, what I'd like to know is this, can you give me a specific example of a political prediction that you've made?
A. Yes.
Q. That was published.
A. Yes.
Q. And that we can check.

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Washington, DC

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Q. And did you immediately accept the engagement when you were contacted?
A. I'm not sure immediately but fairly quickly.
Q. Did you request information?
A. Yes.
Q. What did you ask for?
A. The standard information that one looks for in such matters, most specifically election returns during the last cycle of the 1990s, information about the placement and pairing of incumbents. Information about the placement of cores of old districts in the new districts and the subsidiary information was also provided to me on compactness and precinct, county and municipal place.
Q. Was that something you asked for?
A. Don't recall if I asked for that or not. They sent me a whole mass of data and that was included in it.
Q. You said you asked for information on elections. Did you specify what elections you wanted, you referred to elections over the last cycle of the '90s?
A. Yes. Yes, in particular statewide elections held during the same year as the

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congressional elections, as well as congressional senatorial legislative elections, federal legislative elections held within Pennsylvania.
Q. All right. So you asked for all federal legislative elections in Pennsylvania and all statewide elections?
A. Held during the same years as congressional elections, so the even numbered years.
Q. And why did you specify that, let's call it a data set of information?
A. By looking at statewide elections you can get some assessment of how Republican leaning voters and Democratic leaning voters are allocated into the districts and get a. and then do an analysis of whether the districts are fairly configured with respect to Republican and Democratic leaning voters over the period of the last redistricting.
Q. But you say you only asked for elections in even numbered years, is that right?
A. Yes, that's what I've typically looked at because those are the years in which congressional elections take place. You can get some different patterns in elections on the odd years.
Q. And what did you get? In response to your request?

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A. I got a data set which had all that information in it.
Q. Did you bring that with you this morning?
A. You mean my computerized data set? This was all electronically given to me.
Q. Okay.
A. There's no paper.
Q. Did you bring a printout of your electronic data set?
A. I don't think I ever printed it out. I used it electronically.
Q. Do you have it on a laptop?
A. I do.
Q. Do you have your laptop with you?
A. No.
Q. How many files, how many separate electronic files did you receive?
A. I never counted, maybe 30.
Q. Do you know how many megabytes of information you received?
A. No, but it wasn't huge because, you know, we're dealing with 19 to 21 districts. The only large file I received was a precinct level file which had data by precinct so I could look at that last thing I mentioned to you, the stability over time of

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voting for Democrats and Republicans. The other files were all very small files.
Q. All right. That last file, the precinct specific file, did you just recently receive that?
A. Yes.
Q. When did you receive that?
A. I got that yesterday if I'm not mistaken.
Q. From whom did you get it?
A. Mr. Hirsch.
Q. Who provided you with the other files?
A. Mr. Hirsch.
Q. Have you spoken with anyone other than Mr. Hirsch about the provenance of the data?
A. Mr. Hirsch and Mr. Smith.
Q. So only your counsel Mr. Paul Smith and your other counsel Mr. Sam Hirsch?
A. I don't know if they're my counsel. They explained to me where the data came from.
Q. But you've only talked to them?
A. Yes, at this point.
Q. Now, were you provided a copy of the notice of deposition that was issued in this case?
A. I don't think so. I don't recall seeing it.

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thing so that we are certain we're on the same page is I can forward to you the e-mails that were sent to me.

MR. KRILL: Perfect.

THE WITNESS: Because once the data gets into my system I might be manipulating it in some ways that you wouldn't, so you want the raw data of course.

MR. KRILL: Well, actually I think I would like both, the raw data and the manipulated data so that we can understand your starting point, understand your methodology, understand your end point.

THE WITNESS: So the e-mails and then the e-mails as I've modified them.

MR. KRILL: Yes.

THE WITNESS: Just very slightly modified actually just to make the variables clear. That may take me a little longer because then I'll have to sort it all out.

BY MR. KRILL:

Q. Do you have assistants who work with you on this project?

A. I do.

Q. And who are they?

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A. Bernard Unti, U-n-t-i, a Ph.D. student.

Q. Now, what we're going to do I guess just for the moment here is assume that Mr. Perrelli's representation was accurate and that Dr. Lublin's statistics are your statistics, that is the statistics you received. We'll look forward to seeing your data set transmitted. Would you be able to do that this afternoon at the close of this deposition, Doctor?

A. I'm not certain. I will try.

Q. Tomorrow morning.

A. Certainly by tomorrow morning. No later than tomorrow morning.

Q. Thank you very much. Now, I would appreciate it if you would slowly and carefully walk me through your methodology.

A. Yeah.

Q. From your starting point to your end point in reaching your ultimate conclusion.

A. So you want to walk through each of these tables? Is that what you want to do?

Q. I'd like to know how you started from the data that you received to reach your ultimate conclusion that there was a strong partisan tilt to Act I?

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A. Right, okay.

Q. So what was the first thing you did?

A. First thing I did was, as I said, look at the data but in terms of the methodology that you're asking me what I did was I looked at the existing, the old plan, the one that was in effect for the cycle post 1990 census which I believe had two more districts than the current plan, 21 versus 19. And I looked at the incumbent placement within those 21 districts with particular attention to the placements by party, Republican and Democrat. And then I averaged all the elections statewide that I had within each district. I believe there were 19 elections altogether to look at the average percent Democrat across those statewide elections for each individual district.

I also looked at the overall average for all districts, that is if you look down your page I averaged down the page and that is to see on average looking at all the districts what was the Democratic versus the Republican vote.

Q. All right. Now, is this summarized in table I of Exhibit 1?

A. Yes. What I've told you so far.

Q. Now, let me see if I understand it. The

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bottom row of table 1 has the heading Sum?

A. Right.

Q. And then the first, the third column has the figure 50.3 percent?

A. Right.

Q. And what is --

A. That's the average for all of the districts instead of the individual -- the numbers above it are for each individual district. That's the average for the sum of all the districts.

Q. So if this were in a spreadsheet the formula would be to add the percentages, the 21 percentages above and then divide by 21?

A. Right.

Q. And you come up with 50.3 percent?

A. Right. Now obviously these are rounded percentages but that's what you get when you average them all. Then I looked at whether a district on average for the 19 elections was majority Democrat or majority Republican. That's what that next column represents. It does not mean it has a Democrat or Republican incumbent, that's the first column.

Q. All right. But the, all right, let's start with column labels. 1992 plan, we understand what that means?

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A. Correct.
Q. Incumbent we all know what that means?
A. Right.
Q. Percent DEM 1991 to 2000, that would be the average of five congressional elections, is that correct?
A. No, these are statewide elections.
Q. Oh, all right. So --
A. There are 19 of them.
Q. All right. So you used the 19 statewide elections that you were provided by counsel and then averaged the Democratic vote in that district, correct?
A. Yes and then the next column simply indicates whether the district is above 50 percent Democrat or below 50 percent Democrat on average for the 19 elections.
Q. When you say above or below 50 percent Democrat, are you talking about registered voters?
A. It's always the 19 averaged elections.
Q. Okay. So this fourth column in table 1 has nothing to do with registration?
A. Nothing.
Q. It's only with how ballots were cast for a candidate?

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A. Correct. But not for a candidate.
Q. Right.
A. For 19.
Q. For 19 candidates.
A. Yes.
Q. Yeah.
A. And then the sum simply indicates how many of them were over 50 percent Democratic and under 50 percent Democratic. Then I looked at what you call, I think what did you call Act 1 or the conference plan, the plan under scrutiny and this does several things.

First of all, it looks at the placement and pairings of incumbents in the new plan. So it's a little bit different from incumbent in the second column in that obviously there are no pairings in the 1992 plan but there are a number of pairings of incumbents in the new plan. And so you will get in a couple of cases some repetition of the same district because if you look, for example, at Borski, he's paired with Hoeffel in district 13. And then when you look at Hoeffel he's paired with Borski in district 13.

Then it computes the same average for the 19 elections for each individual district, the same

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average across all districts, and the same analysis of whether a district is over 50 percent Democratic or under 50 percent Democratic and then just a variable which indicates the change in percent Democratic as compared to the 1992 plan.
Q. Now, in looking at these, in arriving at these percentage results for both of the percentage columns, were you basing your percentages on the total vote?
A. Excuse me?
Q. That is the total popular vote in the statewide races?
A. In each, for each district, I simply averaged the vote for that district across all the elections. I did not sum totals.
Q. Okay. All right. And the two columns that are labeled REP or DEM Dis are simply putting party labels on whether a district had a percentage that was above or below 50 percent, right?
A. For the Democrat, yes.
Q. Yes. And if it was above 50 percent you labeled it DEM, if it was below 50 percent you labeled it REP?
A. Correct. So on average was the district won by DEMs or REPs.

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Q. Okay. Now let's see, down at the, for what you've labeled the conference plan the districts are not listed in numeric order?
A. No.
Q. And I'm just trying to eyeball this.
A. You want me to explain how the districts are listed? Will that help you?
Q. Yes, please.
A. They're following the incumbents. So in other words if you look at district 3 in the 1992 plan you see Borski. He is reallocated to district 13 under the new plan. And that's why district 13 is paired up with district 3. In many cases the incumbents are in the same district number but particularly when there is pairings they often are not.
Q. Okay. Now, the final column on the right in table 1, change in percent DEM, what is that?
A. That is if you look at the average percent DEM in 1992 as compared to the average percent DEM in the new plan, the difference between the two.
Q. Okay. And what was your purpose in performing this exercise that's represented in table 1?
A. To examine both simultaneously the way in

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1 which Republican and Democratic leaning voters were
2 allocated into districts to see if the distribution
3 of voters into district matches the overall balance
4 between Democrats and Republicans and secondly to see
5 the effects of pairings upon the new plan.
6 Q. Okay. And what did you do next?
7 A. I then did the same procedure for a series
8 of plans that were presented to me called alternative
9 plans. And these are alternative 2, 3, and 4. So
10 tables 2, 3, and 4 do the same thing we did with
11 respect to table 1 for the conference or Act I, did
12 you call it, plan.
13 Q. Act I, yes.
14 A. Act I for alternative 2, 3, and 4.
15 MR. SMITH: Excuse me a second.
16 (Discussion off the record.)
17 BY MR. KRILL:
18 Q. And what did you do next?
19 A. I did a summary.
20 Q. And is that in Exhibit 1?
21 A. That is in table 5. Simply summarizes
22 information on tables 1 through 4.
23 Q. All right. Now, let's go over it to make
24 sure we understand it. The first column in table 5
25 simply labels the different plans that you examined,

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1 correct?
2 A. Right.
3 Q. Second column has the heading Mean
4 Percentage DEM, what does that mean?
5 A. That corresponds to the average across all
6 districts for each plan. It's that bottom row 50.3
7 and all the others are 49.8.
8 Q. And mean percentage for Republican is
9 similar?
10 A. Yes, same thing. It's just the 100 minus.
11 Q. You're referring to these percentages as a
12 mean in table 5 but we seem to be looking at
13 averages. The same numbers labeled or considered
14 averages in tables 1 through 4, is that correct?
15 A. Averages or means, the particular average
16 being used as the mean.
17 Q. So you're using average as the mean?
18 A. Right. Remember we said it's adding up
19 all of the individual percentages and dividing the
20 total number of districts. That's what I explained
21 for each of the individual tables. That is a mean.
22 Q. Now in mathematics a mean is different
23 than an average, isn't it?
24 A. A mean is a kind of average. There can be
25 other kinds of averages but a mean is just a more

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1 specific way of saying average. Generally in the
2 common language when we say average we mean although
3 it doesn't technically have to be that.
4 Q. And then the fourth column in table 5
5 says, number of DEM districts, correct?
6 A. Right. That's again just picked off the
7 bottom row of each individual one of the tables.
8 Remember I explained how I labeled a district DEM or
9 REP.
10 Q. The fifth column in table 5 says percent
11 of districts, what does that mean?
12 A. That's just 9 divided by 21, 5 divided by
13 19, it's just a percent of districts that fall into
14 the DEM and REP categories.
15 Q. Okay. And then you have similar figures
16 in columns 6 and 7?
17 A. Yes.
18 Q. And the last column, pairings?
19 A. That sums up the pairings of incumbents in
20 each individual plan, again, from tables 1 through 4.
21 Q. And there's a parentheses or a
22 parenthetical -- forgive me, an asterisk in the last
23 column?
24 A. Right.
25 Q. For district 17?

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1 A. Yes, it simply notes that if you go back
2 to table 1 on district 17 it's a heavily Republican
3 leaning district. It's 41.7 percent Democratic on
4 average for the 19 elections.
5 Q. District 17 remains heavily Republican
6 under any plan, any of the plans you've considered
7 here, doesn't it?
8 A. That's probably true. It's particularly
9 important to note it however and the reason I do that
10 is because of the pairing. The Act I or conference
11 plan is the only plan that pairs a Republican and a
12 Democrat together and therefore it is relevant to
13 look at the partisan leaning of the district as well
14 as the allocation of previous cores of each incumbent
15 in that district.
16 Q. And what was your next exercise after
17 completing table 5?
18 A. I was given a set of compactness scores
19 and simply recorded them. I did not compute them
20 myself to look at a comparison of the various plans
21 in terms of their compactness on two standard
22 measures of compactness.
23 Q. Okay. Let's go through table 6 then.
24 That's where this is summed up, right?
25 A. Yes.

what you're driving at.
Q. I'd just kind of like to double check what you're saying.
A. Okay.
Q. So could you please identify a publication that has peer reviewed your methodology in whole or in part?
A. As I said, I've not invented a new methodology. If you want publications that define partisan symmetry and how to measure partisan symmetry, I can certainly give you that.
Q. Okay. Could you please?
A. Yes.
Q. What do you have?
A. There is an article for example by King and Gelman in the American Political Science Review in 1994 in which they define partisan symmetry.
Q. Does your methodology conform to what they advocated in that journal?
A. Well, they're doing some -- they're not looking at an individual plan, they're looking at something quite different but they define partisan symmetry in precisely the same way I define partisan symmetry here.
Q. All right. Are there any publications

that have peer reviewed your methodology for the purpose to which it is being put here?
A. I don't understand the question.
Q. In other words, peer reviewed it as suitable for a particular use?
A. I still don't quite understand what you're driving at.
Q. Well, having a methodology is one thing, Dr. Lichtman, but any, a methodology can be used for different purposes. Do you recognize that?
A. Yes.
Q. And you also recognize, don't you, that a methodology may be more suited to one purpose than to another purpose.
A. That's conceivable.
Q. All right. So what I'm asking is, is there any published material that we can look at that has reviewed the use of the methodology you've described this morning for the purpose to which you're putting it this morning?
A. All of these articles that deal with the question of partisan symmetry are putting it to the purpose of measuring whether or not a plan or a whole set of plans favor voters of one party or voters of another party which is precisely the same purpose to

which and, you know, I can certainly cite a number of authors whose work you can look at if you would like me to.
Q. Please, yes.
A. I think I mentioned Gelman and King.
Q. Yes?
A. Bernard Grofman.
Q. Grofman and what article would we look at or publication?
A. There's a lot of publications that these authors have done. Grofman has a fairly recent one with some coauthors in electoral studies, in 1997 which he talks about looking at the difference between the averages.
Q. Is it a book or an article?
A. I think it's part of -- I don't remember exactly, I think it's part, it's maybe a chapter within a book. I can get you the exact cite if you want me to.
Q. Please. You can just e-mail it to me?
A. Okay. Bruce Cain has two books.
Q. Ka?
A. K-a-i-n.
Q. K- as?
A. Did I say K, sorry, C-a-i-n.

Q. And what are his books?
A. One thing is called The Reapportionment Puzzle and I don't remember the exact title of the other one but something like, you know, Redistricting Analysis. I mean he only has two dealing with this topic.
Q. Okay. And can you cite to any other publications?
A. There has been work by J. Morgan Kousser.
Q. How do you spell Kousser?
A. K-o-u-s-s-e-r. He's also looked into these matters as well.
Q. And this is a book?
A. No. He's written an article on this point. I don't remember the exact citation but if you want I can get that to you as well.
Q. Sure. Do you remember the name of the journal?
A. I don't.
Q. And can you recall any others?
A. There are others but I think this is a pretty good list of leading authorities in the field.
Q. And the leading authorities are the ones who come to mind first I guess?
A. Yeah, but I don't mean to say there aren't

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other authorities in the field. And I don't mean to rank anybody or anything like that. You've asked me for some examples and these are examples.
Q. I'm sure there will be no hard feelings among your peers?
A. There are many others who have written in this field. There's lots of work.
Q. Now, aren't there also other methodologies that are used for analyzing the partisan lean of districts?
A. You can use other methodologies for analyzing the partisan leaning of districts.
Q. Okay. And what other methodologies are you aware of?
A. You can, for example, actually try to predict whether a Democrat or Republican will win the district as opposed to laying out whether the district leans Republican or Democrat.
Q. Is there a name for that methodology?
A. Gary King has developed one approach to that. There are others. It's called JudgeIt in which he actually attempts to predict outcomes of elections given various averages for a baseline vote.
Q. Have you ever used that?
A. I have not.

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Q. Are you familiar with it?
A. I'm familiar with it but I've not used it.
Q. How does it work?
A. He has a prediction equation based on various characteristics of the district and from that prediction equation given a certain baseline average, he attempts to predict within each individual district whether it would go Republican or Democrat across a reasonable range of about 45 to 55 percent average Democrat or Republican. It's designed likewise to measure this partisan symmetry concept we've looked at.
Q. Is there any other methodology that you're aware of?
A. Yes. You can, it's a similar methodology to what I've used but you can also look at each individual election and see the extent to which for an individual election, there is partisan symmetry for that one election.
Q. Does that methodology have a name or an author attached to it?
A. No, I don't, it's -- no. There's no particular statistical technique there.
Q. When you referred to Gary King and JudgeIt that sounds like a, that sounds like a piece of

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software?
A. There is such a piece of software that he calls JudgeIt that he has developed.
Q. Okay. But this other technique that you're talking about is not a software package?
A. No, no. It's just looking at an individual election as I said in terms of the partisan symmetry. For that one you don't need a software package for that.
Q. And is that usable for congressional districts?
A. You could use it for any set of districts.
Q. Have you used that alternative?
A. I have.
Q. Have you used it for congressional districts?
A. I have.
Q. Is there a published description of that methodology?
A. Again, it's not, you know, it's not like JudgeIt where it's a, you know, a statistical technique that someone has developed as I said applying the partisan symmetry concept to an individual election.
Q. I take it you have not used this

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alternative individual district by district technique in this case?
A. I've looked at it but I think a more complete measure is provided by tables 1 through 4 because they combine the analysis of individual districts with the pairing. I think that's particularly appropriate in analyzing the plan we're looking at here.
Q. What other methodologies besides the one you've used, JudgeIt, and then I'll call it the individual district methodology, are there?
A. You could also attempt to produce predictions not using, you know, Gary King's particular package but using standard statistical methods like regression analysis.
Q. All right. And have you used regression analysis in other cases?
A. Not recently but I think I did 10 years ago.
Q. Why have you given up using regression analysis?
A. My purpose is not to predict the outcome of elections. I had in some cases. Ten years ago I had that purpose. They were different kinds of cases. The purpose here is simply to look at the

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configuration of the districts and the pairings and how they affect the ability of Democrats and Republicans to compete.
Q. All right. So just so we're clear on that, then your conclusion is not a prediction of outcomes in Pennsylvania congressional elections, is it?
A. I am not making a formal prediction of who is going to win or lose. I am simply looking at how the districting process has affected the ability of candidates in these elections. In the end, strange things can happen.
Q. Now, there -- are you saying that there are, let's say variables that affect outcomes of campaigns?
A. There are always variables that affect outcomes of campaigns.
Q. What kinds of variables could affect the outcome of a congressional campaign?
A. Say someone, take Gary Condit, someone gets involved in a major scandal. That's obviously the kind of thing that would be independent of the districting process that could affect the outcome of a campaign.
Q. Scandal. Okay. What else?

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A. Major gaffs, mistakes.
Q. What else?
A. Now are we talking about anything that could affect a campaign or things that are independent of the districting process? Or anything?
Q. I'm talking about the variables that affect the outcome of a campaign, aside from the districting process.
A. Almost anything could affect the outcome of a campaign. Spending, issues, debates, speeches, advertising.
Q. Incumbency?
A. Well, incumbency is part of the redistricting process but of course incumbency could affect the outcome of a campaign.
Q. But incumbency is a transient sort of thing, isn't it?
A. I don't understand the question.
Q. That is an incumbent today could be hit by a bus or move on to another public office tomorrow?
A. Strange and unusual events can happen in any set of human affairs but incumbency beyond that is a pretty predictable characteristic. You know who the incumbents are.
Q. Well you know who they are at the moment,

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correct?
A. Correct.
Q. But you don't know who they're going to be in two years, do you?
A. You mean after the next election?
Q. Yes.
A. They can change during an election, that's correct.
Q. Right. Let me give you an example. Are you familiar with the former 18th district under the 1992 Pennsylvania plan?
A. Not especially. Not as an expert.
Q. Do you recall who the incumbent was when that plan was promulgated by the Pennsylvania Supreme Court in 1992?
A. I don't.
Q. If I told you that it was a Republican named Rick Santorum, would that surprise you?
A. No.
Q. And if I told you that he won reelection in that district but shortly thereafter moved up to the United States Senate, would that surprise you?
A. No.
Q. And would it surprise you to learn that after he moved on, his district went from Republican

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to Democrat in terms of its representation?
A. Wouldn't surprise me.
Q. And that it has stayed Democrat?
A. Wouldn't surprise me.
Q. So you would agree then that incumbency is a factor that can be considered for the immediate future but that can change very drastically over, from one election cycle to another?
A. It can but the balance of incumbencies do not usually change drastically from one election cycle to another.
Q. Well, do you know who the incumbent is in District 4, that appears on table 1?
A. Hart.
Q. Hart, do you know who Hart is?
A. Do I know who Hart is? I'm not sure I understand the question.
Q. Do you know who Congressperson Hart is?
A. Am I specifically familiar with that person? No.
Q. No. Your table shows that Congressperson Hart, that's Melissa Hart is in a district with a majority of registered -- well, a district that's actually gone Democratic on the average?
A. Correct.

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Q. If I were to tell you that she's a young and talented and ambitious congresswoman who might seek higher office or statewide office within a couple of years, would that strike you as a very unusual thing to take place?
MR. SMITH: Objection to form.
BY MR. KRILL:
Q. But you may answer.
A. I wouldn't say it's very unusual but as I said, the bulk of incumbencies don't change over an election.
Q. Let's look at some other variables. Coattail factors?
A. Can be.
Q. How about weather?
A. Remotely. Very remotely.
Q. You're not familiar with Pennsylvania politics?
A. No, I'm not an expert. Just what I read and study in general.
Q. So all of these variables make it a risky business to predict election outcomes, don't they?
A. It's always a risky business to predict. That doesn't mean that you can't do it or that it wouldn't for the great bulk of them be quite

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accurate.
Q. Now, of the different methods that you've described, is there anyone that you use the most in your work?
A. As I said, I've not used the JudgeIt method and I have not used it recently attempt to predict outcomes through regression analysis.
What I've done in my work is similar to what I've done here, looking at the composition of the districts as compared to some overall district average for partisan symmetry and looking at the effect of pairings, if there are pairings.
Q. By the way, I'd like to ask you if we've covered the list of known methodologies that are used in your field for looking at partisan impact in districting?
A. Not entirely, no.
Q. What others are there?
A. One that's similar to this and similar to what Gary King does is sometimes called a vote seats ratio and that is to, again, using this concept of partisan symmetry look at the relationship between the percentage of votes on average received by a party and the number of districts won. That's quite similar to what I've done here because the basic

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concept is at the 50 percent point it should be equal between the two parties. And we have the 50 percent point here empirically.
Q. All right. We don't have proportional representation in this country, do we?
A. No.
Q. We have a winner take all systems, correct?
A. Correct.
Q. And that does lead to disproportionate results, correct?
A. Disproportionate to what?
Q. Well, that is that the overall election results can, in terms of who gets what votes can be disproportionate to what gets elected.
A. I still don't follow you, who gets what votes, the winner will get elected.
Q. Yes, yeah, but in a, you know, in a national race, for example -- well, let's look at, you know, Reagan Mondale?
A. Okay.
Q. Do you recall what percentage of the popular vote Ronald Reagan got?
A. About 60.
Q. And what percentage of the popular vote

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did Vice President Mondale get?
A. About 40.
Q. About 40. Did Vice President Mondale get 40 percent of the states?
A. No.
Q. So the outcome there was not proportional to the popular vote, was it?
A. That's correct.
Q. And the same thing can happen on a -- let's say, a statewide basis when you look at congressional districts, correct?
A. Yes. If you get 55 percent of the average vote, you will typically get more than 55 percent of the seats. And that would be true of either party and that's why you're looking at partisan symmetry, not that if you get 55 percent of the seats, of the votes rather, that means 55 percent of the seats. The only point at which that would apply is at the 50 percent market.
Q. Now, you're aware, aren't you, that there are concentrations of registered Democrat voters and of actual Democrat votes in certain parts of Pennsylvania?
A. Yes.
Q. And do you know where they are?

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A. Philadelphia, Pittsburgh, and I believe there's some, one or two other areas where there are some heavier concentrations of Democrats than others.
Q. You're also aware that there are concentrations of minorities in certain areas of Pennsylvania and that those, those areas, you know, very roughly are coterminous with those concentrations of registered Democrats?
A. Very roughly. There are areas, I believe, that have Democrats that are not heavy minority areas, but the heavy minority areas in my understanding do tend to be Democrat.
Q. Do you know what congressional districts in Pennsylvania are, let's say, majority-minority districts?
A. I haven't looked at that specifically but just from my general knowledge I think it would be most likely to be Districts 1 and 2.
Q. So those two districts would tend to have heavy concentrations of people who vote Democratic, correct?
A. Correct. Heavier at least in other parts of the state.
Q. And in fact, according to your table 1 they do, don't they?

A. Yes.
Q. Now you can't really spread them out. You can't start a district line in, on the Delaware River front in Philadelphia and draw a congressional district that streams across the state, can you?
MR. SMITH: Objection to form.
THE WITNESS: I'm sure you can.
BY MR. KRILL:
Q. Would you do so?
A. I've not looked at the drawing of districts in Pennsylvania so I can't answer that.
Q. Now, are you, between now and, you know, March 11th, are you planning to conduct any other analyses?
A. That would depend of course upon what the other side produces and whether the lawyers ask me to consider other issues. I never know what lawyers might ask me so it's possible.
Q. Okay. At the moment are you working on any other analyses?
A. No.
Q. Is your assistant of whom you mentioned earlier working on any other analyses?
A. No.
Q. In connection with this case, have you

talked with any other people in your field?
A. No.
Q. You haven't compared notes with any other experts?
A. No. I've looked at material that Dr. Lublin prepared, as you know, but I've not spoken to him.
MR. KRILL: Why don't we take a break.
(Recess.)
MR. KRILL: Tom Brunell has signed off of the conference call so we now just have Bart Delone here on the phone.
BY MR. KRILL:
Dr. Lichtman, does Exhibit 1 which you've explained this morning show all of the calculation that you've done in this matter?
A. I'm sure I've done calculations that are not in these tables but this is, to this point what my opinion is based upon.
Q. Oh, I see. So you've done side calculations but you're not relying on them, is that what you're saying?
A. I'm relying on what's in Exhibit 1 to this point, yes.
Q. Okay. What side calculations have you

done on which you are not relying?
A. I always do a lot of calculations when you're doing a project. I did that calculation that I mentioned to you, looking at individual elections. I think that may be. In terms of calculations, that may be the only other significant calculation that isn't reflected in here. I can't recall any others but it's possible as you go through a project that you do things that you discard and move on.
Q. Right. Right. Now, is your calculation of the individual like something that you've preserved in a spreadsheet or database or in hard copy format?
A. I do not have a hard copy anymore. It's in the data. In other words, each individual election return is in the database that I am going to give you.
Q. Okay.
A. So any one could do that based on that database.
Q. I'm wondering if you save and printed out or forwarded to someone else a version of that spreadsheet that had the calculation in it?
A. I did at one point forward it to the attorneys. Whether they've saved it or not, I can't

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say.
Q. All right.
A. I didn't because as I said, I've saved what I'm planning to rely on.
Q. Let me request that it also be provided to me by e-mail so that I can take a look at the underlying formula. I assume when you use a spreadsheet you can, your form you lie are transparent in the spreadsheet, you can look at them, peek in the cell and see what's there?
A. The spread sheets I'm giving you are just data, period.
Q. Okay. I'm looking for calculation.
A. I haven't preserved the calculations.
Q. Okay. But you think that you may have sent calculations to your attorneys?
A. I'm sure that I did.
Q. And that's what I'm requesting.
A. As I've said, I have no idea if they've saved them or not.
Q. Okay. So what you're relying on is what we see here in Exhibit 1?
A. Correct. To this point as I've explained several times.
MR. KRILL: I guess that's it.

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MR. SMITH: Okay.
THE WITNESS: And I should be able to e-mail you the raw data today.
BY MR. KRILL:
Q. Terrific. I would appreciate that since I'm doing you a favor here by finishing early?
A. Understood. The one thing I'm not sending you here today is where all I did is change the label on top to get rid, the data you will have, will say like Bush, Clinton or, you know, Gore, I changed it to DEM, REP, if you need that, that I have in my laptop at home. But I do have the original e-mail if that's sufficient.
MR. KRILL: Yes, that's fine.
(Whereupon, at 11:40 a.m., the taking of the instant deposition ceased.)

_____
Signature of the Witness
SUBSCRIBED AND SWORN to before me this _____ day of _____, 20____.

_____
Notary Public
My Commission Expires:_____

TABLE 1

INCUMBENT PAIRING & PARTY STRENGTH, 1992 PLAN & CONFERENCE PLAN COMPARED

1992 PLAN	INCUMBENT	% DEM 1991-2000	REP OR DEM DIST	CONF PLAN	INCUMBENT	% DEM 1991-2000	REP OR DEM DIST	CHAN IN % DE
DIST 1	BRADY (D)	79.7%	DEM	DIST 1	BRADY (D)	77.3%	DEM	-2.4%
DIST 2	FATTAH (D)	83.0%	DEM	DIST 2	FATTAH (D)	81.7%	DEM	-1.3%
DIST 3	BORSKI (D)	59.5%	DEM	DIST 13	BORSKI (D) HOEFFEL (D)	48.9%	REP	-10.6
DIST 4	HART (R)	52.0%	DEM	DIST 4	HART (R)	48.6%	REP	-3.4%
DIST 5	PETERSON (R)	41.2%	REP	DIST 5	PETERSON (R)	42.1%	REP	+0.9
DIST 6	HOLDEN (D)	44.0%	REP	DIST 17	HOLDEN (D) GEKAS (R)	41.7%	REP	-2.3%
DIST 7	WELDON (R)	42.9%	REP	DIST 7	WELDON (R)	43.1%	REP	+0.2
DIST 8	GREENWOOD (R)	45.6%	REP	DIST 8	GREENWOOD (R)	46.0%	REP	+0.4
DIST 9	SHUSTER (R)	37.7%	REP	DIST 9	SHUSTER (R)	39.9%	REP	+2.2
DIST 10	SHERWOOD (R)	46.1%	REP	DIST 10	SHERWOOD (R)	41.5%	REP	-4.6
DIST 11	KANJORSKI (D)	50.9%	DEM	DIST 11	KANJORSKI (D)	53.5%	DEM	+2.6
DIST 12	MURTHA (D)	51.9%	DEM	DIST 12	MURTHA (D)	59.5%	DEM	+7.6
DIST 13	HOEFFEL (D)	46.9%	REP	DIST 13	HOEFFEL (D) BORSKI (D)	48.9%	REP	+2.0
DIST 14	COYNE (D)	60.0%	DEM	DIST 14	COYNE (D) DOYLE (D)	66.1%	DEM	+6.
DIST 15	TOOMEY (R)	47.5%	REP	DIST 15	TOOMEY (R)	47.0%	REP	-0.5
DIST 16	PITTS (R)	36.5%	REP	DIST 16	PITTS (R)	34.6%	REP	-1.9
DIST 17	GEKAS (R)	36.9%	REP	DIST 17	GEKAS (R) HOLDEN (D)	41.7%	REP	+4.
DIST 18	DOYLE (D)	53.9%	DEM	DIST 14	DOYLE (D) COYNE (D)	66.1%	DEM	+1
DIST 19	PLATTS (R)	38.2%	REP	DIST 19	PLATTS (R)	38.0%	REP	-0.
DIST 20	MASCARA (D)	54.4%	DEM	DIST 18	MASCARA (D)	46.8%	REP	-7.
DIST 21	ENGLISH (R)	47.7%	REP	DIST 3	ENGLISH (R)	46.4%	REP	-1.
				DIST 6	OPEN	44.5%	REP	
SUM		50.3%	12 REP 9 DEM			49.8%	14 REP 5 DEM	

Curriculum Vitae

Allan J. Lichtman
9219 Villa Dr.
Bethesda, MD 20817

(301) 530-8262 h
(202) 885-2401 o

EDUCATION

BA, Brandeis University, Phi Beta Kappa, Magna Cum Laude, 1967

PhD, Harvard University, Graduate Prize Fellow, 1973

PROFESSIONAL EXPERIENCE

Teaching Fellow, American History, Harvard University, 1969-73

Instructor, Brandeis University, 1970, quantitative history.

Assistant Professor of History, The American University, 1973-1977

Associate Professor of History, The American University, 1977-78

Professor of History, The American University, 1978 -

Associate Dean for Faculty and Curricular Development, College of Arts & Sciences, The American University 1985 - 1987

Chair, Department of History, American University, 1997- 2001

Editor, Lexington Books Series, Studies in Modern American History

HONORS AND AWARDS

Outstanding Teacher, College of Arts and Sciences, 1975-76

Outstanding Scholar, College of Arts and Sciences, 1978-79

Outstanding Scholar, The American University, 1982-83

Outstanding Scholar/Teacher, The American University, 1992-93 (Highest University faculty award)

Sherman Fairchild Distinguished Visiting Scholar, California Institute of Technology, 1980-81

American University summer research grant, 1978 & 1982

Chamber of Commerce, Outstanding Young Men of America 1979-80

Graduate Student Council, American University, Faculty Award, 1982

Top Speaker Award, National Convention of the International Platform Association, 1983, 1984, 1987

National Age Group Champion (30 - 34) 3000 meter steeplechase 1979

Eastern Region Age Group Champion (30 - 34) 1500 meter run 1979

Defeated twenty opponents on nationally syndicated quiz show, TIC TAC DOUGH, 1981

Biographical Listing in Marquis, WHO□s WHO IN THE AMERICA AND WHO□s WHO IN THE WORLD

Selected by the Teaching Company as one of America□s □Super Star Teachers.□

SCHOLARSHIP

A. Books

PREJUDICE AND THE OLD POLITICS: THE PRESIDENTIAL ELECTION OF 1928 (Chapel Hill: University of North Carolina Press, 1979)

PREJUDICE AND THE OLD POLITICS: THE PRESIDENTIAL ELECTION OF 1928 (Lexington Books, 2000), reprint of 1979 edition with new introduction.

HISTORIANS AND THE LIVING PAST: THE THEORY AND PRACTICE OF HISTORICAL STUDY (Arlington Heights, Ill.: Harlan Davidson, Inc., 1978; with Valerie French)

ECOLOGICAL INFERENCE (with Laura Irwin Langbein, Sage Series in Quantitative Applications in the Social Sciences, 1978)

YOUR FAMILY HISTORY: HOW TO USE ORAL HISTORY, PERSONAL FAMILY ARCHIVES, AND PUBLIC DOCUMENTS TO DISCOVER YOUR HERITAGE (New York: Random House, 1978)

KIN AND COMMUNITIES: FAMILIES IN AMERICA (edited, with Joan Challinor, Washington, D. C.: Smithsonian Press, 1979)

THE THIRTEEN KEYS TO THE PRESIDENCY (Lanham: Madison Books, 1990, with Ken DeCell)

THE KEYS TO THE WHITE HOUSE, 1996 EDITION (Lanham: Madison Books, 1996)

THE KEYS TO THE WHITE HOUSE, (Lanham: Lexington Books Edition, 2000)

WHITE PROTESTANT AMERICA: THE RISE OF THE MODERN AMERICAN RIGHT, under contract, Grove/Atlantic Press, with Leonard Moore

B. Scholarly Articles

"The Federal Assault Against Voting Discrimination in the Deep South, 1957-1967," JOURNAL OF NEGRO HISTORY (Oct. 1969)

"Executive Enforcement of Voting Rights, 1957-60," in Terrence Goggin and John Seidel, eds., POLITICS AMERICAN STYLE (1971)

"Correlation, Regression, and the Ecological Fallacy: A Critique," JOURNAL OF INTERDISCIPLINARY HISTORY (Winter 1974)

"Critical Election Theory and the Reality of American Presidential Politics, 1916-1940," AMERICAN HISTORICAL REVIEW (April 1976)

"Across the Great Divide: Inferring Individual Behavior From Aggregate Data," POLITICAL METHODOLOGY (with Laura Irwin, Fall 1976)
"Regression vs. Homogeneous Units: A Specification Analysis," SOCIAL SCIENCE HISTORY (Winter 1978)

"Language Games, Social Science, and Public Policy: The Case of the Family," in Harold Wallach, ed., APPROACHES TO CHILD AND FAMILY POLICY (Washington, D. C.: American Association for the Advancement of Science, 1981)

"Pattern Recognition Applied to Presidential Elections in the United States, 1860-1980: The Role of Integral Social, Economic, and Political Traits," PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCE (with V. I. Keilis-Borok, November 1981)

"The End of Realignment Theory? Toward a New Research Program for American Political History," HISTORICAL METHODS (Fall 1982)

"Kinship and Family in American History," in National Council for Social Studies Bulletin, UNITED STATES HISTORY IN THE 1980s (1982)

"Modeling the Past: The Specification of Functional Form," JOURNAL OF INTERDISCIPLINARY HISTORY (with Ivy Broder, Winter 1983)

"Political Realignment and `Ethnocultural` Voting in Late Nineteenth Century America," JOURNAL OF SOCIAL HISTORY (March 1983)

"The `New Political History:`Some Statistical Questions Answered," SOCIAL SCIENCE HISTORY (with J. Morgan Kousser, August 1983)

"Personal Family History: A Bridge to the Past," PROLOGUE (Spring 1984)

"Geography as Destiny," REVIEWS IN AMERICAN HISTORY (Sept., 1985)

"Civil Rights Law: High Court Decision on Voting Act Helps to Remove Minority Barriers," NATIONAL LAW JOURNAL (with Gerald Hebert, November 10, 1986).

"Tommy The Cork: The Secret World of Washington`s First Modern Lobbyist," WASHINGTON MONTHLY (February, 1987).

"Discriminatory Election Systems and the Political Cohesion Doctrine," NATIONAL LAW JOURNAL (with Gerald Hebert, Oct. 5, 1987)

"Aggregate-Level Analysis of American Midterm Senatorial Election Results, 1974-1986," PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES (Dec. 1989, with Volodia Keilis-Borok)

"Black/White Voter Registration Disparities in Mississippi: Legal and Methodological Issues in Challenging Bureau of Census Data," JOURNAL OF LAW AND POLITICS (Spring, 1991, with Samuel Issacharoff)

"Adjusting Census Data for Reapportionment: The Independent Role of the States," NATIONAL BLACK LAW JOURNAL (1991)

"Passing the Test: Ecological Regression in the Los Angeles County Case and Beyond," EVALUATION REVIEW (December, 1991)

Understanding and Prediction of Large Unstable Systems in the Absence of Basic Equations," PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM ON CONCEPTUAL TOOLS FOR UNDERSTANDING NATURE (with V. I. Keilis-Borok, Trieste, Italy, 1991).

"The Self-Organization of American Society in Presidential and Senatorial Elections," in Yu.

Krautsov, ed., THE LIMITS OF PREDICTABILITY (with V.I. Keilis-Borok, Nauka, Moscow, 1992).

"'They Endured:' The Democratic Party in the 1920s," in Ira Foreman, ed., DEMOCRATS AND THE AMERICAN IDEA: A BICENTENNIAL APPRAISAL (1992).

"A General Theory of Vote Dilution," LA RAZA (with Gerald Hebert) 6 (1993).

"Adjusting Census Data for Reapportionment: The Independent Role of the States," JOURNAL OF LITIGATION (Dec. 1993, with Samuel Issacharoff)

"The Keys to the White House: Who Will be the Next American President?," SOCIAL EDUCATION 60 (1996)

"The Rise of Big Government: Not As Simple As It Seems," REVIEWS IN AMERICAN HISTORY 26 (1998)

"The Keys to Election 2000," SOCIAL EDUCATION (Nov/Dec. 1999), pp. 422-424

"The Keys to the White House 2000," NATIONAL FORUM (Winter, 2000), pp. 13-16.

"Report on the Implications for Minority Voter Opportunities if Corrected census Data Had Been Used for the Post-1990 Redistricting: States With The Largest Numerical Undercount," UNITED STATES CENSUS MONITORING BOARD, January 2001

"Report on the Racial Impact of the Rejection of Ballots Cast in the 2000 Presidential Election in the State of Florida," and "Supplemental Report," in VOTING IRREGULARITIES IN FLORIDA DURING THE 2000 PRESIDENTIAL ELECTION, United States Commission on Civil Rights, June 2001

"The Alternative-Justification Affirmative: A New Case Form," JOURNAL OF THE AMERICAN FORENSIC ASSOCIATION (with Charles Garvin and Jerome Corsi, Fall 1973)

"The Alternative-Justification Case Revisited: A Critique of Goodnight, Balthrop and Parsons, `The Substance of Inherency,'" JOURNAL OF THE AMERICAN FORENSIC ASSOCIATION (with Jerome Corsi, Spring 1975)

"A General Theory of the Counterplan," JOURNAL OF THE AMERICAN FORENSIC ASSOCIATION (with Daniel Rohrer, Fall 1975)

"The Logic of Policy Dispute," JOURNAL OF THE AMERICAN FORENSIC ASSOCIATION (with Daniel Rohrer, Spring 1980)

"Policy Dispute and Paradigm Evaluation," JOURNAL OF THE AMERICAN FORENSIC

ASSOCIATION (with Daniel Rohrer, Fall 1982)

"New Paradigms For Academic Debate," JOURNAL OF THE AMERICAN FORENSIC ASSOCIATION (Fall, 1985)

"Competing Models of the Debate Process," JOURNAL OF THE AMERICAN FORENSIC ASSOCIATION (Winter 1986)

"The Role of the Criteria Case in the Conceptual Framework of Academic Debate," in Donald Terry, ed., MODERN DEBATE CASE TECHNIQUES (with Daniel Rohrer, 1970)

"Decision Rules for Policy Debate," and "Debate as a Comparison of Policy Systems," in Robert 2, ed., THE NEW DEBATE: READINGS IN CONTEMPORARY DEBATE THEORY (with Daniel Rohrer, 1975)

"A Systems Approach to Presumption and Burden of Proof;" "The Role of Empirical Evidence in Debate;" and "A General Theory of the Counterplan," in David Thomas, ed., ADVANCED DEBATE: READINGS IN THEORY, PRACTICE, AND TEACHING (with Daniel Rohrer, 1975)

"Decision Rules in Policy Debate;" "The Debate Resolution;" "Affirmative Case Approaches;" "A General Theory of the Counterplan;" "The Role of Empirical Evidence in Debate;" and "Policy Systems Analysis in Debate," in David Thomas, ed., ADVANCED DEBATE (revised edition, with Daniel Rohrer and Jerome Corsi, 1979)

C. Popular Articles

"Presidency By The Book," POLITICS TODAY (Nov. 1979) Reprinted:
LOS ANGELES TIMES

"The Grand Old Ploys," NEW YORK TIMES
Op Ed (July 18, 1980)

"The New Prohibitionism," THE CHRISTIAN CENTURY (Oct. 29, 1980)

"Which Party Really Wants to `Get Government Off Our Backs`?" CHRISTIAN SCIENCE MONITOR Opinion Page (Dec. 2, 1980)

"Do Americans Really Want `Coolidge Prosperity` Again?" CHRISTIAN SCIENCE MONITOR Opinion Page (August 19, 1981)

"Chipping Away at Civil Rights," CHRISTIAN SCIENCE MONITOR Opinion Page (Feb. 17, 1982)

"How to Bet in 1984. A Presidential Election Guide," WASHINGTONIAN MAGAZINE (April

1982) Reprinted: THE CHICAGO TRIBUNE

"The Mirage of Efficiency," CHRISTIAN SCIENCE MONITOR Opinion Page (October 6, 1982)

"For RIFs, It Should Be RIP," LOS ANGELES TIMES Opinion Page (January 25, 1983)

"The Patronage Monster, Con`t." WASHINGTON POST Free For All Page (March 16, 1983)

"A Strong Rights Unit," NEW YORK TIMES Op Ed Page (June 19, 1983)

"Abusing the Public Till," LOS ANGELES TIMES Opinion Page (July 26, 1983)

The First Gender Gap," CHRISTIAN SCIENCE MONITOR Opinion Page (August 16, 1983)

"Is Reagan A Sure Thing?" FT. LAUDERDALE NEWS Outlook Section (Feb. 5, 1984)

"The Keys to the American Presidency: Predicting the Next Election," TALENT (Summer 1984)

"GOP: Winning the Political Battle for `88," CHRISTIAN SCIENCE MONITOR, Opinion Page, (Dec. 27, 1984)

"The Return of `Benign Neglect`," WASHINGTON POST, Free For All,
(May 25, 1985)

"Selma Revisited: A Quiet Revolution," CHRISTIAN SCIENCE MONITOR, Opinion Page, (April 1, 1986)

"Democrats Take Over the Senate" THE WASHINGTONIAN (November 1986; article by Ken DeCell on Lichtman`s advance predictions that the Democrats would recapture the Senate in 1986)

"Welcome War?" THE BALTIMORE EVENING SUN, Opinion Page, (July 15, 1987)

"How to Bet in 1988," WASHINGTONIAN (May 1988; advance prediction of George Bush's 1988 victory)

"President Bill?," WASHINGTONIAN (October 1992; advance prediction of Bill Clinton's 1992 victory)

"Don't be Talked Out of Boldness," CHRISTIAN SCIENCE MONITOR, Opinion Page (with Jesse Jackson, November 9, 1992)

"Defending the Second Reconstruction," CHRISTIAN SCIENCE MONITOR, Opinion Page (April 8, 1994)

"Quotas Aren't The Issue," NEW YORK TIMES, Op Ed Page (Dec. 7, 1994)

"History According to Newt," WASHINGTON MONTHLY (May, 1995)

"A Ballot on Democracy," WASHINGTON POST (Nov. 1, 1998)

"The Theory of Counting Heads vs. One, Two, Three," CHRISTIAN SCIENCE MONITOR (June 22, 1999)

Bi-weekly column, THE MONTGOMERY JOURNAL, GAZETTE 1990 - present

Election-year column, REUTERS NEWS SERVICE 1996 & 2000

D. Reviews

Robert W. Fogel and Stanley Engerman, TIME ON THE CROSS: THE ECONOMICS OF SLAVERY, THE NEW REPUBLIC (July 6, 1974)

Burl Noggle, INTO THE TWENTIES, AMERICAN HISTORICAL REVIEW (1976)

Jerome Clubb, William Flanigan, and Nancy Zingale: PARTISAN REALIGNMENT, AMERICAN HISTORICAL REVIEW (1982)

Paul M. Kleppner, WHO VOTED?, JOURNAL OF AMERICAN HISTORY (1983)

Stanley Kelley, INTERPRETING ELECTIONS, JOURNAL OF AMERICAN HISTORY (1984)

Paula Eldot, AL SMITH AS GOVERNOR OF NEW YORK, AMERICAN HISTORICAL REVIEW (1984)

Paul Kleppner, THE THIRD ELECTORAL SYSTEM, JOURNAL OF AMERICAN HISTORY (1988)

Arno Mayer, WHY THE HEAVENS DID NOT DARKEN, WASHINGTON POST (1989)

TEACHING

Ongoing Courses

The History of the U. S. I & II, The Emergence of Modern America, The U. S. in the Twentieth Century, United States Economic History, Historiography, Major Seminar in History, Graduate Research Seminar, Colloquium in U. S. History Since 1865, The American Dream, The Urban-Technological Era, Senior Seminar in American Studies, Seminar in Human

Communication.

New Courses: Taught for the first time at The American University

Quantification in History, Women in Twentieth Century American Politics, Women in Twentieth Century America, Historians and the Living Past (a course designed to introduce students to the excitement and relevance of historical study), How to Think: Critical Analysis in the Social Sciences, Pivotal Years of American Politics, Government and the Citizen (Honors Program), Introduction to Historical Quantification, Public Policy in U. S. History, Honors Seminar in U.S. Presidential Elections, America□s Presidential Elections.

TELEVISION APPEARANCES

Political commentary on NBC, CBS, ABC, CNN, C-SPAN, CNN, FOX, MSNBC, BBC, PBS, and numerous other broadcasting outlets internationally

Regular political commentary for NBC News Nightside.

Regular political commentary for Voice of America and USIA.

Regular political commentary for America□s Talking Cable Network.

Regular political commentary for the Canadian Broadcasting System.

Appearances on numerous foreign television networks.

Consultant and on-air commentator for NBC special productions video project on the history of the American presidency.

CBS New Consulant, 1998 and 1999

RADIO SHOWS

I have participated in more than 1500 radio interview and talk shows broadcast nationwide, in foreign nations, and in cities such as Washington, D. C., New York, Atlanta, Chicago, Los Angeles and Detroit. My appearances include the Voice of America, National Public Radio, and well as all major commercial radio networks.

PRESS CITATIONS

I have been cited hundreds of times on public affairs in the nation□s leading newspapers. These

include, among many others,

New York Times, Washington Post, USA Today, Los Angeles Times, Wall Street Journal, Miami Herald, Washington Times, St. Louis Post Dispatch, Christian Science Monitor, Philadelphia Inquirer.

CONFERENCES AND LECTURES

Invited participant and speaker, Bostick Conference on Fogel and Engerman`s TIME ON THE CROSS, University of South Carolina, Nov. 1-2, 1974

"Critical Election Theory and the Presidential Election of 1928," Annual Meeting of the American Historical Association, Dec. 1974
"A Psychological Model of American Nativism," Bloomsberg State Historical Conference, April 1975

"Methodology for Aggregating Data in Education Research," National Institute of Education, Symposium on Methodology, July 1975 (with Laura Irwin)

Featured Speaker, The Joint Washington State Bicentennial Conference on Family History, Oct. 1975

Featured Speaker, The Santa Barbara Conference on Family History,
May 1976

Chairman, The Smithsonian Institution and the American University Conference on Techniques for Studying Historical and Contemporary Families, June 1976

Panel Chairman, Sixth International Smithsonian Symposium on Kin and Communities in America, June 1977

"The uses of History for Policy Analysis," invited lecture, Federal Interagency Panel on Early Childhood Research, Oct. 1977

Invited participant, Conference on "Child Development within the Family - Evolving New Research Approaches," Interagency Panel of the Federal Government for Research and Development on Adolescence, June 1978

Commentator on papers in argumentation, Annual Meeting of the Speech Communication Association, Nov. 1978

Commentator on papers on family policy, Annual Meeting of the American Association for the Advancement of Science, Jan. 1979

"Phenomenology, History, and Social Science," Graduate Colloquium of the Department of Philosophy," The American University, March 1979

"Comparing Tests for Aggregation Bias: Party Realignments of the 1930`s," Annual Meeting of the Midwest Political Science Association March 1979, with Laura Irwin Langbein

"Party Loyalty and Progressive Politics: Quantitative Analysis of the Vote for President in 1912," Annual Meeting of the Organization of American Historians, April 1979, with Jack Lord II

"Policy Systems Debate: A Reaffirmation," Annual Meeting of the Speech Communication Association, Nov. 1979

"Personal Family History: Toward a Unified Approach," Invited Paper, World Conference on Records, Salt Lake City, Aug. 1980

"Crisis at the Archives: The Acquisition, Preservation, and Dissemination of Public Documents," Annual Meeting of the Speech Communication Association, Nov. 1980

"Recruitment, Conversion, and Political Realignment in America: 1888- 1940," Social Science Seminar, California Institute of Technology, April 1980

"Toward a Situational Logic of American Presidential Elections," Annual Meeting of the Speech Communication Association, Nov. 1981

"Political Realignment in American History," Annual Meeting of the Social Science History Association, Oct. 1981

"Critical Elections in Historical Perspective: the 1890s and the 1930s," Annual Meeting of the Social Science History Association, Nov. 1982

Commentator for Papers on the use of Census data for historical research, Annual Meeting of the Organization of American Historians, April 1983

"Thirteen Keys to the Presidency: How to Predict the Next Election," Featured Presentation, Annual Conference of the International Platform Association, August 1983, Received a Top Speaker Award

"Paradigms for Academic Debate," Annual Meeting of the Speech Communication Association, Nov. 1983

Local Arrangements Chairman, Annual Convention of the Social Science History Association Oct. 1983

"Forecasting the Next Election," Featured Speaker, Annual Convention of the American Feed Manufacturers Association (May 1984)

Featured Speaker, "The Ferraro Nomination," Annual Convention of The International Platform Association, August 1984, Top Speaker Award

"Forecasting the 1984 Election," Annual Convention of the Social Science History Association Oct. 1984,

Featured Speaker, "The Keys to the Presidency," Meeting of Women in Government Relations Oct. 1984

Featured Speaker, "The Presidential Election of 1988," Convention of the American Association of Political Consultants, December, 1986

Featured Speaker, "The Presidential Election of 1988," Convention of the Senior Executive Service of the United States, July 1987

Commentary on Papers on Voting Rights, Annual Meeting of the American Political Science Association, September 1987.

Commentary on Papers on Ecological Inference, Annual Meeting of the Social Science History Association, November 1987.

Featured Speaker: "Expert Witnesses in Federal Voting Rights Cases," National Conference on Voting Rights, November 1987.

Featured Speaker: "The Quantitative Analysis of Electoral Data," NAACP National Conference on Voting Rights and School Desegregation, July 1988.

Panel Chairman, "Quantitative Analysis of the New Deal Realignment," Annual Meeting of the Social Science History Association, Nov. 1989.

Keynote Speaker, Convocation of Lake Forest College, Nov. 1989.

Featured Speaker, The American University-Smithsonian Institution Conference on the Voting Rights Act, April 1990

Panel Speaker, Voting Rights Conference of the Lawyer's Committee for Civil Rights Under Law, April 1990

Panel Speaker, Voting Rights Conference of the NAACP, July 1990

Panel Speaker, Voting Rights Conference of Stetson University, April 1991

Panel Chairman, Annual Meeting of the Organization of American Historians, April, 1992

Panel Speaker, Symposium on "Lessons from 200 Years of Democratic Party History, Center for National Policy, May 1992

Olin Memorial Lecture, U.S. Naval Academy, October 1992

Commentator, Annual Meeting of the Organization of American Historians, April, 1993

Panel presentation, Conference on Indian Law, National Bar Association, April 1993

Feature Presentation, Black Political Science Association, Norfolk State University, June 1993

Delegation Head, Delegation of Washington Area Scholars to Taiwan, Presented Paper on the promotion of democracy based on the American experience, July 1993

Feature Presentation, Southern Regional Council Conference, Atlanta Georgia, November, 1994

Master of Ceremonies and Speaker, State of the County Brunch, Montgomery County, February, 1996

Feature Presentation, □Predicting The Next Presidential Election,□ Freedom□s Foundation Seminar on the American Presidency, August 1996

Feature Presentation, □Predicting The Next Presidential Election,□ Salisbury State College, October 1996

Feature Presentation on the Keys to the White House, Dirksen Center, Peoria, Illinois, August, 2000

Feature Presentation on American Political History, Regional Conference of the Organization of American Historians, August 2000

Testimony Presented Before the United States Commission on Civil Rights Regarding Voting Systems and Voting Rights, January 2001

Testimony Presented Before the United States House of Representatives, Judiciary Committee, Subcommittee on the Constitution, February 2001

Testimony Presented Before the United States Senate, Government Operations Committee, Regarding Racial Differentials in Ballot Rejection Rates in the Florida Presidential Election, June 2001

DEPARTMENTAL AND UNIVERSITY SERVICE

Department of History Council 1973 -

Undergraduate Committee, Department of History 1973-77

Chairman Undergraduate Committee, Department of History 1984-85

Graduate Committee, Department of History, 1978-84

Freshman Advisor, 1973-1979

First Year Module in Human Communications, 1977-79

University Committee on Fellowships and Awards 1976-78

University Senate 1978-79, 1984-85

University Senate Parliamentarian and Executive Board 1978-79

Founding Director, The American University Honors Program, 1977-79

Chairman, College of Arts and Sciences Budget Committee 1977-78, 1982-84

University Grievance Committee, 1984-85

Member, University Honors Committee 1981-82

College of Arts and Sciences Curriculum Committee 1981-82

Jewish Studies Advisory Board, 1982-1984

Mellon Grant Executive Board, College of Arts & Sciences, 1982-83

Chairman, College of Arts and Sciences Faculty Colloquium, 1983

Chairman, College of Arts and Sciences Task Force on the Department of Performing Arts, 1984-85

Local Arrangements Chairman, National Convention of the Social Science History Association, 1983

Chairman, Rank & Tenure Committee of the Department of History, 1981-82, 1984-85

Board Member, Center for Congressional and Presidential Studies, The American University, 1988-89

Chairman, Graduate Committee, Department of History, 1989 - 1991

Chairman, Distinguished Professor Search Committee 1991

Member, College of Arts & Sciences Associate Dean Search Committee, 1991

Board Member, The American University Press, 1991-95

Chair, Subcommittee on Demographic Change, The American University Committee on Middle States Accreditation Review 1992-94

Member, Dean's Committee on Curriculum Change, College of Arts and Sciences 1992 - 1993

Member, Dean's Committee on Teaching, College of Arts and Sciences 1992 -

Co-Chair, Department of History Graduate Committee, 1994-95

Vice-Chair, College of Arts & Sciences Educational Policy Committee, 1994-95

Elected Member, University Provost Search Committee, 1995-96

Chair, Search Committee for British and European Historian, Department of History, 1996

OTHER POSITIONS

Director of Forensics, Brandeis University, 1968-71

Director of Forensics, Harvard University, 1971-72

Chairman, New York-New England Debate Committee, 1970-71

Historical consultant to the Kin and Communities Program of the Smithsonian Institution 1974-1979

Along with general advisory duties, this position has involved the following activities:

1. directing a national conference on techniques for studying historical and contemporary families held at the Smithsonian in June 1976.
2. chairing a public session at the Smithsonian on how to do the history of one's own family.
3. helping to direct the Sixth International Smithsonian Symposium on Kin and

Communities in America (June 1977).

4. editing the volume of essays from the symposium.

Consultant, Expert Witness and Analyst of Third Parties in the United States.

1. Consultant to John Anderson campaign for president, 1980.

I researched and wrote a study on "Restrictive Ballot Laws and Third-Force Presidential Candidates." This document was a major component of Anderson's legal arguments against restrictive ballot laws that ultimately prevailed in the Supreme Court (Anderson v. Celebreeze 1983). According to Anderson's attorney: "the basis for the majority's decision echoes the themes you incorporated in your original historical piece we filed in the District Court."

2. Expert Witness for New Alliance Party Ballot Access in State of Alabama, 1990 (New Alliance Party v. Hand)

I analyzed the state of Alabama□s system for third-party ballot access to demonstrate that the state□s early filing deadline for third parties imposed an undue burden on such parties, without justification by a compelling state interest for the ballot restrictions. My analysis was accepted by the federal district court (in which I was recognized as an expert on third parties) in a decision that was upheld by the 11th Circuit Court of Appeals.

3. Expert Witness for Reform Party Ballot Access in State of Arkansas, 1996 (Citizens to Establish a Reform Party in Arkansas v. Priest)

I analyzed the state of Arkansas system for third-party ballot access to demonstrate that the combination of an early filing deadline and relatively high signature requirements for third parties imposed an undue burden on such parties, without justification by a compelling state interest for the ballot restrictions. I also analyzed the burdens placed on third-parties by the disparity between third-party and independent signature requirements and by the lack of a cure provision for ballot signatures, which is available for initiative and referendum petitions. My analysis was accepted by the federal district court in which I was again recognized as an expert on third parties.

4. Books and articles dealing with third parties in the United States.

These include PREJUDICE AND THE OLD POLITICS: THE PRESIDENTIAL ELECTION OF 1928, THE THIRTEEN KEYS TO THE PRESIDENCY, THE KEYS TO THE WHITE HOUSE, 1996, "Critical Election Theory and the Reality of American Presidential Politics, 1916-1940," AMERICAN HISTORICAL REVIEW (April 1976), "Political Realignment and `Ethnocultural` Voting in Late Nineteenth Century America," JOURNAL OF SOCIAL HISTORY (March 1983), "'They Endured:' The Democratic Party in the 1920s," in Ira Foreman, ed., DEMOCRATS AND THE AMERICAN IDEA: A BICENTENNIAL APPRAISAL (1992).

5. Media Citations and appearances.

These include quotations in newspaper articles dealing with third parties, analyses of the role of third parties in popular articles (e.g., □President Bill?□ WASHINGTONIAN (Oct., 1992), an appearance as a third-party expert on C-SPAN□s Washington Journal program on third parties (03/20/96), appearances on United States Information Agency□s Worldnet television on the American party system, an appearance on National Public Radio Talk of the Nation as an expert on third parties, and a speech to foreign correspondents at the National Press Club on third parties.

Statistical Consultant to the George Washington University Program of Policy Studies in Science and Technology, 1983

I advised researchers at the Policy Studies Program on the application of pattern recognition techniques to their work on the recovery of communities from the effects of such natural disasters as earthquakes and floods.

Expert Witness-on Quantitative Analysis, Political Systems, Political History, and Voting Behavior for the Lawyers, Committee for Civil Rights Under Law 1983-

I have analyzed racial bloc voting, turnout, and registration; socioeconomic conditions; political systems; and methodological issues for voting rights cases involving the following ,Jurisdictions: Petersburg, Virginia; Boston Massachusetts; Holyoke Massachusetts; Hinds County Mississippi; the state of Mississippi (voter registration); the state of Mississippi (judicial elections); Springfield, Illinois, Pittsburgh Pennsylvania; Anchorage, Alaska; Holyoke, Massachusetts; Crittenden County, Arkansas; Red Clay School District, Delaware; the state of Florida (judicial elections). I have also analyzed statistical information on promotion practices for probation officers within the Philadelphia Court of Common Pleas.

I prepared written reports for each of the three of the Mississippi cases, the Pittsburgh case, the Red Clay School District case, the Philadelphia case, and the Florida judges case. I presented in-court testimony for the judicial and registration cases in Mississippi, two judicial cases in Florida, and for the cases involving Springfield, Illinois; Holyoke Massachusetts; Crittenden County, Arkansas; and Red Clay School District.

Expert Witness on Quantitative Analysis, Political Systems, Political History, and Voter Behavior for the United States Department of Justice 1983 -

I have analyzed racial bloc voting; turnout and registration; socioeconomic conditions; political systems; methodological issues for voting rights cases in the following jurisdictions: Greenwood, Mississippi; Halifax County, North Carolina; Valdosta, Georgia; Bessemer, Alabama; Marengo County, Alabama; Dallas County, Alabama; Selma, Alabama; Cambridge, Maryland; Darlington County, South Carolina; Lee County, Mississippi; Passaic, New Jersey;

Lawrence, Massachusetts; Santa Paula, California; the state of North Carolina (judicial elections); Augusta, Georgia; Wicomico County, Maryland; the state of Mississippi; Los Angeles, California; the state of Georgia (judicial elections, majority vote requirement, and Shaw v. Reno type challenge); the state of Florida (statewide legislative plans); the state of Texas (judicial elections, Edwards Aquifer governing plans); the city of Chicago (Shaw v. Reno type challenge to Hispanic congressional district).

I prepared written reports for the cases in Greenwood, Halifax County, Marengo County, Dallas County, Selma, Cambridge, Wicomico County, Los Angeles County, Lee County, Passaic, Lawrence, Santa Paula, Georgia, Florida, and Texas, and Chicago. I presented in-court testimony for the cases in Dallas, Marengo, Wicomico, and Los Angeles Counties, and the states of Florida, Georgia (judicial elections, Shaw v. Reno challenge), and Chicago.

Expert Witness on Quantitative Analysis, Political Systems, Demography, and Voter Behavior for State, Municipal and County Jurisdictions, 1986-

I have analyzed matters such as racial and party bloc voting, turnout and registration, annexations, racial demography, political systems, and methodological issues for various state, municipal and county jurisdictions: Claiborne County, Mississippi; Dade County, Florida; Grenada County, Mississippi; Spartansburg, South Carolina; Maywood School District, Illinois; Crete-Monee School District and Rockford School District, Illinois; the city of New York (Charter Revision Commission); the state of North Carolina (judges and redistricting); the state of Virginia; the state of Maryland; the state of Texas; the state of Connecticut; the state of Pennsylvania (non-partisan commission); the state of New York (Assembly); the state of New Jersey (non-partisan commission); the state of Louisiana; the State of Texas (Speaker of the House), the state of Illinois (Speaker of the House), the city of New York (Charter Revision Commission), and Indianapolis, Indiana.

I prepared written reports for Claiborne, Grenada, and Dade Counties, Crete-Monee School District, and the states of Louisiana, Maryland, New Jersey, North Carolina, New York, Texas, and Virginia. I presented oral testimony on behalf of Claiborne County, Crete-Monee School District, the state of Texas, the state of New Jersey, the state of Illinois, the state of North Carolina, and the state of Louisiana. For the states of Louisiana, Texas, and North Carolina I have provided testimony related to issues posed in the Supreme Court case, Shaw v Reno.

Expert Witness on Quantitative Analysis, Political Systems, Political History, and Voter Behavior for Private Attorneys: 1986-

I analyzed matters such as racial bloc voting, turnout and registration, political systems, political history, annexations, and methodological issues for private attorneys in voting rights cases taking place in Boyle, Mississippi; Cleveland, Mississippi; Mississippi statewide (on behalf of minority voters, legislative plan and Supreme Court Districts); City of Starke and Hardee County, Florida; Peoria Illinois; Chicago Heights, Illinois; Jefferson County, Alabama; Chickasaw, Lafayette, Monroe, Newton, Simpson, and Yalobusha counties, Mississippi; Columbus County, North Carolina; Kent County, Michigan; Massachusetts statewide (on behalf

of Republican party, legislative plan), Michigan statewide (on behalf of Democratic party, legislative and congressional plans), New Jersey statewide (on behalf of the Democratic party), Texas Statewide (on behalf of IMPAC 2000), and Virginia statewide (on behalf of the Democratic party). I have analyzed statistical results of employment decisions by employers for an employment discrimination case, analyzed the history of peremptory strikes of black and white jurors in Hinds County for a death penalty case, and ballot access by third parties in Jefferson County, Alabama. I have analyzed the influence of voting system technology on voting in Florida during the 2000 presidential election.

I prepared written reports for all cases except Peoria and Jefferson County and have presented oral testimony in the jury selection case; Starke County; Hardee County; Jefferson County; Chicago Heights, Monroe County; Chickasaw County; Lafayette County; Newton County, Columbus County; the statewide Michigan cases; the statewide Mississippi redistricting case; and the Florida voting systems case.

Expert Witness on Quantitative Analysis, Political Systems, Political History, and Voter Behavior for the ACLU. 1987 -

I analyzed racially polarized voting, the socioeconomic standing of racial groups, and black political opportunities for Henrico and Brunswick Counties, Virginia; and Southern Pines and Moore County, North Carolina. I prepared a written report for the Henrico case and the Southern Pines case. I presented in-court testimony for the Henrico, Brunswick, and Southern Pines cases.

Expert Witness on Quantitative Analysis, Political Systems, Political History, and Voter Behavior for the Southern Poverty Law Center. 1990 -

I analyzed racially polarized voting, the socioeconomic conditions, and black political opportunities for judicial circuits in Alabama. I prepared a written report and presented oral testimony.

Expert Witness for the Mexican-American Legal Defense Fund, 1991 -

I analyzed the impact of the Census undercount on the state legislative plan in Texas, including oral testimony in state court. I analyzed racially polarized voting in the city of Chicago and its implications for aldermanic elections.

Expert Witness on Quantitative Analysis, Political Systems, Political History, and Voter Behavior for the NAACP, 1993-

I prepared a written report and presented in-court testimony for the NAACP's challenge to the State House and Senate plan in Michigan.

Expert Witness on voter purging for the Puerto Rican Legal Defense and Education Fund 1991 -

I prepared a written report and presented in-court testimony for PRLDEF's challenge to voter purging in Philadelphia.

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In The Matter Of:

Richard Vieth, et al. v.
Commonwealth of Pennsylvania, et al.

Thomas L. Brunell
February 19, 2002

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A: I'm telling you that if you want me to draw conclusions about appropriate methods, appropriate data, then you're probably going to have to tell me what method you're talking about.
Q: I'm asking you as the expert whether you can think of any method that would use those data and be professionally acceptable. If you can't answer the question, that's fine, but I do think I'm entitled to an answer. Can you think of one or not?
A: With respect to JudgeIt, I would use congressional —
Q: I'm not asking about JudgeIt. I'm asking about other methods. You've already said that with JudgeIt you wouldn't use it.
A: Right.
Q: Are there other methods that come to mind where one would use statewide election data?
A: Again, with the hypothetical swing, the other method I would use congressional election data. I can't think of any others off the top of my head that you could use statewide election data to get an estimate of partisan bias, a point estimate.

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Q: Are you, in some way, modifying your answer now to limit it to getting a point estimate of partisan bias as opposed to some other estimate of partisan bias?
A: I think that's what I said previously. I think that's what I testified to.
Q: I'm sorry I didn't understand you. So maybe we need to go back. Where does this concept of a point estimate come into the discussion?
A: I said that, a few questions ago, I said that I would do a partisan bias analysis and from that analysis have a number. Here is the level of partisan bias usually described in a proportion or a percentage.
Q: The record will reflect whether you said any of this before or not, but I'd like you to say it this time, Professor. Now, tell me what you mean by a number reflecting partisan bias.
A: The results from JudgeIt, one of the major results that you get is a number, a definite discrete number that, again, would be a percentage, for instance. And let's say that it's five percent partisan bias in an electoral system. Since we are only dealing with two parties, they are symmetric or asymmetric to one

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another. So let's say it's a five percent that favors the Democratic party, which you would interpret as when both parties get 50 percent of the votes, the Democrats get an extra five percent of the seats. So that takes away five percent from the Republican party. So that's the partisan bias, it's five percent.
Q: Okay. Now, I asked you before whether you do think of any methods for analyzing partisan bias that would rely on statewide data. Now I'd like you not to confine yourself to methods which produce a single point estimate. I'd like you to broaden your analysis and broaden your perspective to include other ways you could analyze partisan bias and see whether you can think of a method in which you could use statewide data to analyze partisan bias?
A: You could, and Dr. Lichtman has, look at how statewide elections break down into individual congressional districts. The utility of doing that is that you control for differing factors and differing races like incumbency, quality of candidates, campaign finance, things of that nature. So it gives you, without trying to control for these other variables, you can do a

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simple analysis of how statewide elections break down into these different districts. In fact, I have done that previously.
Q: And that kind of analysis is professionally acceptable in your judgment?
A: It can give an indication about what's happening in the redistricting plan. It does not provide, necessarily, a point estimate for the bias.
Q: But it gives you information about the extent of bias in the plan; is that correct?
A: Well, I don't know if I said that.
Q: I didn't ask you whether you said that. I'm asking whether you think it.
A: I know. It does not give you an estimate for partisan bias as political scientists define it. So sometimes when you say bias, I can interpret that as meaning something else other than partisan bias. Does it give you a partisan bias estimate like JudgeIt, no. Can it give you an indication about the relationship between seats and votes, yes.
Q: Are you familiar with the concept of partisan symmetry?
A: I mean, I could ascribe something to partisan asymmetry, but I'm not sure I know exactly what

you mean.
Q: That's not a term you've heard used before?
A: Partisan bias deals with partisan symmetry.
Partisan symmetry could mean lots of things.
Q: But it has no particular meaning that you're aware of in your profession?
A: I would probably think it has to do with electoral systems.
(Brunell Deposition Exhibit #1 marked for identification)
BY MR. SMITH:
Q: Professor Brunell, showing you what's been marked as Exhibit 1, this is your supplemental expert report in the Texas litigation. Is that right?
A: That appears to be.
Q: Do you recall doing a supplemental expert report on partisan bias in the Texas litigation?
A: Yes.
Q: This was a situation where the Democrats had called a witness, Professor Katz, who had used JudgeIt to, and congressional data, to produce a point estimate of the extent of bias in various proposed plans; is that right?
A: That's my recollection.

Q: And you criticized him for using congressional data and said that it would be better to use statewide election results to tabulate the relationship between seats and votes. Is that true?
A: No, I don't think I said that.
Q: Would you refer to the second sentence of your report, please. It says, "Instead of using Congressional election results, which have complications of incumbency and variance across races in terms of campaign finance, candidate quality and a whole host of other variables, I used statewide election results to calculate the relationship between seats and votes." Did you make that statement in that report?
A: I did.
Q: And did you also testify in that case?
A: Yes.
Q: Did you testify that your analysis based on statewide election results gave a better picture of the extent of partisan bias in the various plans than Dr. Katz's analysis?
A: I think it gave another look at it. Like I said before, statewide races have the value of holding constant things like incumbency, candidate quality, campaign finance, whereas Congressional elections don't necessarily do that. Professor Katz ran the results. I don't recall all the things that Professor Katz did.
Q: It's true that in terms of what you did everything you did was using statewide election results reaggregated into the Congressional districts in various proposed plans. Is that right?
A: I believe that's correct.
Q: Was the analysis that you presented in the Texas litigation a professionally acceptable analysis of partisan bias?
A: Again, this isn't, I don't in this report, calculate partisan bias. What I was really trying to show in Texas was what I called in the report, I believe, the majoritarian principle, which is when a party wins over 50 percent of the votes it ought to also win 50 percent of the seats.
Q: And that's a statement you made in a report which was called Supplemental Analysis Of Partisan Bias. Is that right?
A: That appears to be the title, yes.
Q: Is this an analysis of partisan bias?

A: It does not give a point estimate.
Q: Is it an analysis of partisan bias?
A: I may have been — it's not an analysis of — it does not give a point estimate of partisan bias. There are some indications in here.
Q: We'll be here a long time if you don't answer my question instead of trying to answer the question you prefer I ask, Doctor.
MR. KRILL: Well, counsel, you know perfectly well the witness is entitled to qualify any answer to any leading question you may ask and that's what he's trying to do.
MR. SMITH: Which you know perfectly well he's trying to avoid the question.
BY MR. SMITH:
Q: Is it an analysis of partisan bias, regardless of the question of whether it gives a point estimate or not?
A: Again, I think there is a difference between when we talk about, when we just talk about partisan bias which may have been the way that I was using it here and partisan bias in terms of kind of a social, a more social scientific use of the term, which is what I refer to in terms of getting point estimates for bias.

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Q: This was an analysis which you thought was appropriate to present to a federal court and a state court in Texas dealing with the question of the fairness of a particular districting map; is that correct?
A: That's correct.
Q: And the elections that you used here, all statewide elections, which statewide elections did you use?
A: I don't recall off the top of my head. I asked the TLC, which may or may not have stood for the Texas Legislative Counsel for all statewide elections in the previous decade, if my memory serves me correctly.
Q: Do you know whether you included in that statewide judicial elections?
A: I'm almost certain that I did.
Q: Now, over on Page 3 of Exhibit 1, you make the statement, the second sentence in the first full paragraph, "That is, if the two parties split the vote 50/50, they also each get 50 percent of the seats. The political science literature refers to deviations from this ideal as "partisan bias"." Is that a statement that you stick by today?

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A: Yes.
Q: And can you tell me which political science literature you were referring to there?
A: There's lots of literature on partisan bias.
Q: Which literature defines partisan bias as deviations from the ideal of getting 50 percent of the seats when you get 50 percent of the votes?
A: Do you want me to name articles?
Q: I do. Following Mr. Krill's lead on this.
A: I'm glad that Professor Lichtman mentioned my article in his testimony. I think the first article was by Professor Tufte in about 1974, perhaps. Gary King and Andrew Gelman have at least two articles one in the American Political Science Review and one in the American Journal of Political Science on partisan bias.
Q: These are all articles which define it as deviations from the ideal of getting 50 percent of the vote with — 50 percent of the seats with 50 percent of the vote?
A: Well, it's with regard to the differential treatment of the parties, like I said before. If partisan bias is five percent, that means that one party is getting five percent more of the seats at the 50/50 level than they do the vote.

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Q: Any others?
A: There are lots of other ones.
Q: Including you mentioned an article you wrote. What article is that?
A: I believe you have it in front of you. It was an Electoral Systems in maybe 1997 written with Bernie Grofman and Bill Koetzle.
Q: Bernie Grofman is one of the leading experts in this field?
A: Yes.
Q: What was the third name?
A: Koetzle, K-o-e-t-z-l-e.
Q: Now, in your article that you wrote with Mr. Grofman and Mr. Koetzle, you advocate studying partisan bias by getting a national vote share for each of the two parties and then plugging those into the Congressional districts; is that right?
A: I don't think so.
Q: Let me have this marked as Exhibit 2.
(Brunell Deposition Exhibit #2 marked for identification)
BY MR. SMITH:

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Q: I'm showing you what has been marked as Exhibit 2. Let me ask you to turn over to Page 461. First sentence in the first full paragraph, "All methods of calculating partisan bias have in common the need to specify each party's national share of the two-party vote as a baseline for calculating a seats/votes relationship from which bias is to be estimated.".
Now is that a statement that you needed to get a national share of the vote that you then plug back into Congressional districts?
A: No, I don't think so.
Q: Can you explain that statement to me, please?
A: Again, partisan bias you start, this is with regard to the relationship between votes and seats, the translation of votes into seats in an electoral system.
Q: Right.
A: And in this article, we talk about using JudgeIt as the method for figuring out what we call distributional bias.
Q: I'm not asking you about the article. I'm asking about this statement. Now, what is the national share of the two-party vote? What does that refer to?

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A: If you're going to include — so congressional elections happen both in presidential years and then in off years.
Q: In even-numbered off year?
A: That's correct. Off years mean non-presidential even-numbered years. It's somewhere between the two. I think that statewide elections that happen in odd years, I would use. In general, I think that the more data you can bring to bear might give you a better idea about what's going on.
Q: If Dr. Lichtman decided instead that the data relating to odd-year elections were involved in electorate were substantially different than the electorate that shows up in Congressional elections and therefore would not be particularly helpful or valid basis on which to make his calculations, do you think that was an error on his part?
A: I don't know why he used a 1991 special election if that was his decision.
Q: Was there anything else, though, about the explanation I just gave you that you disagree with?
A: No, I think I would have used the statewide.

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Q: I understand that. My question was if Dr. Lichtman disagreed with you and said that he thought the electorate would be sufficiently different in odd years that it could skew the analysis, do you think that was an error on his part?
A: Yes. I think I would have used all statewide elections. Therefore, I would criticize him for leaving those out.
Q: If in Texas you didn't use any odd-year elections and didn't use any judicial elections, that was an error on your part as well?
A: I asked for from the TLC which has all the data available at the punch of a button, all statewide elections.
Q: If your analysis wasn't based on that, was that an error on your part?
A: No, it was an error on the people that provided me the data.
(Brunell Deposition Exhibit #3 marked for identification)
BY MR. SMITH:
Q: Now, Professor, Exhibit 3 is the exhibit that was called Exhibit 1 at Professor Lichtman's deposition last week. And I'd ask you to focus

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on Table 1, first of all. You were listening to Dr. Lichtman's deposition when he explained this table; is that right?
A: I came in five or ten minutes late. But I think that I heard his testimony with regard to this table. I didn't hear the whole deposition.
Q: Now, can you tell me, do you disagree with Dr. Lichtman in terms of his ability to draw conclusions about bias in Act One from this table?
A: Yes.
Q: Can you tell me what it is that you disagree with with respect to the significance of the analysis and data presented in Table 1?
A: He hasn't established any relationship between the data that he used here and Congressional elections first off.
Q: So this is the correlation issue. You'd want to do a correlation between statewide elections and Congressional elections?
A: Right. I think you'll start with Congressional elections and then you can bring other data to bear on that issue as well.
Q: How would you establish a relationship between statewide elections and Congressional elections?

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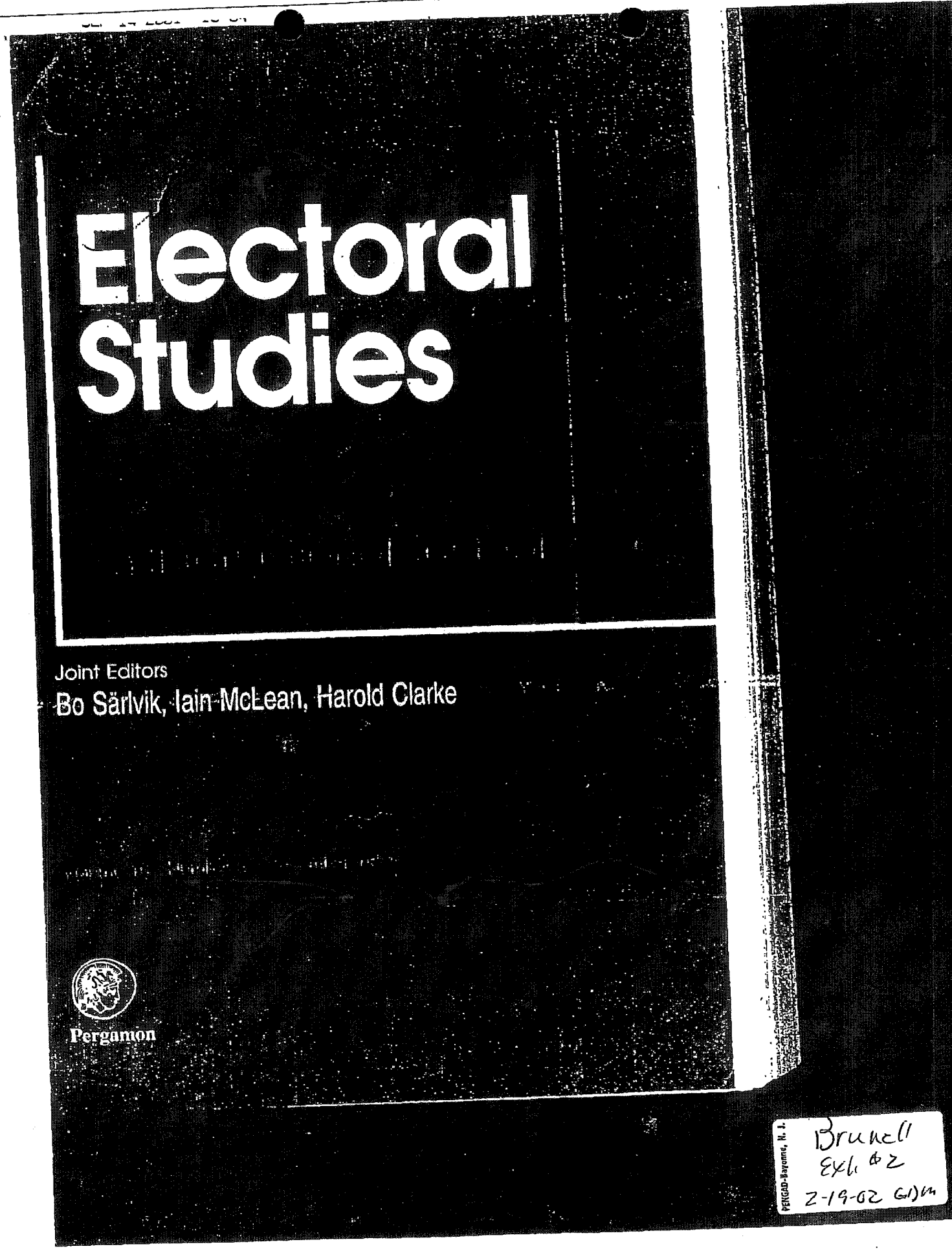
A: Again, you could run a correlation analysis.
Q: What would you want to find before you included statewide elections in your analysis?
A: I think you would want to establish that there are some relationship between the two.
Q: How much of a relationship would you have to have?
A: I mean you can't decide what the relationship is until the relationship is whatever it is. It could be a negative relationship, but if it's a really a strong relationship, then maybe you could make some conclusions.
Q: Did you check for a correlation between statewide results and Congressional elections in Texas before you presented testimony based solely on statewide elections?
A: I don't recall.
Q: Do you have some reason to believe that there is not a strong relationship between the performance of statewide candidates and congressional candidates in Pennsylvania?
A: The first point is that we don't know what the relationship is. I don't know. Nobody at this table knows.
Q: Do you want to answer my question now?



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An Integrated Perspective on the Three Potential Sources of Partisan Bias: Malapportionment, Turnout Differences, and the Geographic Distribution of Party Vote Shares

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Partisan bias refers to an asymmetry in the way party vote share is translated into seats, i.e., a situation where some parties are able to win a given share of seats with a lesser (share of the) vote than is true for other parties. Any districted system is potentially subject to partisan biases. We show that there are three potential sources of partisan bias: (1) differences in the nature of the vote shares of the winning candidates of different parties that give rise to differences in the proportion of each party's votes that come to be 'wasted'—differences which arise because of the nature of the geographic distribution of partisan support; (2) turnout rate differences across districts that are linked to the partisan vote shares in those districts, such that certain parties are more likely to have 'cheap seats' *vis-à-vis* turnout; and (3) malapportionment. In the context of two-party competition over single-member districts we provide a simple formulation to calculate the *independent* effect of each of these three factors. We illustrate our analysis with a calculation of the magnitude and direction of effects of the three determinants of partisan bias in elections to the US House and the US Senate in 1984, 1986 and 1988; then we consider how to extend the approach to a system with a mix of single- and multi-member districts or to a weighted voting system such as the US electoral college. We then apply the method to calculate the nature and sources of partisan bias in the 1984 and 1988 US presidential elections. © 1997 Elsevier Science Ltd. All rights reserved.

Keywords: seats and votes, malapportionment, turnout, elections, redistricting, bias

In two-party political competition, there are two basic measures of the characteristics of a seats–votes curve showing the relationship between a party's vote share and its (expected) share of the seats: *partisan bias* and *swing ratio* (Tufte, 1973): The swing ratio, often denoted β, is a measure of the responsiveness of the electoral system to change in the vote. In two-party competition, the *swing ratio* is taken to be the expected size of the percent point increase in seat-share for each percentage point increase in a party's share of the aggregate vote above

50 per cent, i.e., swing is analogous to a tangent to the seats–votes curve (Tufte, 1973).[1] Partisan bias can be thought of as the (expected) advantage/disadvantage in seat-share above/below 50 per cent received by a given party that wins 50 per cent of the vote.[2] In two-party competition, *partisan bias* is customarily taken to be the difference between the seat-share a given party with exactly 50 per cent of the vote can expect to win and the seat-share that it should win if both parties were treated equally by the electoral rules, i.e., a seat share of 50 per cent (Tufte, 1973).

It is well known (Gudgin and Taylor, 1979; Johnston, 1981; Brady and Grofman, 1991b) that, in two-party competition, swing ratio is largely a function of the number of competitive districts. Similarly, it is well known that partisan bias is also, at least in part, a function of the asymmetry in the distribution of partisan voting strength across constituencies (Gudgin and Taylor, 1979; Johnston, 1981; Taylor *et al.*, 1986; Brady and Grofman, 1991b). In particular, if one party wins most of its seats by disproportionately large vote shares and loses most of the seats it loses by relatively narrow vote shares, while the reverse is true for the other party (or parties), then partisan bias exists against the first party. Such bias may have been caused by intentional gerrymandering or by an 'accident' of geography. Any districted system is potentially subject to partisan biases.[3]

The focus of this paper is on the determinants of partisan bias in two-party systems. The partisan bias that arises because of differences in the distribution of party voting strength across constituencies that creates differences between each party's share of 'wasted votes' is only one of the three basic ways in which an electoral system may manifest partisan bias. The other two ways to create partisan bias are (a) through malapportionment, i.e., differences in population across districts (e.g., Baker, 1955; Rydon, 1968; May, 1974; Yamakawa, 1984; Jackman, 1994),[4] and (b) through differences in turnout rates across districts (Campbell, 1996).[5] However, neither malapportionment nor unequal turnout, *per se*, generate partisan bias; it is only when population or turnout differences across districts are linked to the distribution of party voting strength that we get partisan bias. While this fact is well known in the electoral systems literature (e.g., Jackman, 1994, Rydon, 1968), in discussions of partisan bias in the United States it is still customary to focus primarily (if not exclusively) on the distributional causes of partisan bias. While this is not that unreasonable in the case of the US House elections since the one-person, one-vote revolution, it does not make sense for other types of analysis, e.g., for analyzing partisan bias in the US Senate or in the US electoral college. Moreover, while population in US House districts is now almost perfectly equal within states, it is often forgotten that, across states, there can be dramatic differences in average House district size. In the 1990s apportionment, for example, the largest district in the United States had 1.7 times the population in the smallest (Grofman, 1992). Thus, despite the one-person, one-vote standard it is still quite reasonable to imagine that there might be a partisan bias in the US House due to malapportionment.

While distributional effects, malapportionment effects and turnout effects are not, in general, mutually exclusive, we can conceptually separate them in the following way by imagining three ideal types: In the first, all districts are equally populated[6] and the same proportion of voters turn out in each (or, at least constituency population and turnout are uncorrelated with the distribution of party voting strength at the constituency level), but the distribution of voting strength across districts is such that one party's victories are costlier than the others in terms of winning its seats by larger vote shares, on the average. In the second, all districts are equally populated (or, at least district population is uncorrelated with distribution of party voting strength at the constituency level) and the distribution of mean partisan voting strength across

districts does not generate any partisan bias, but one party's voters do tend to turn out at a lower level than do voters of the other party. In the third case, while the distribution of mean partisan voting strength across districts does not generate any partisan bias, and each party's voters tend to turn out at the same rate as do voters of the other party (or, at least, turnout is uncorrelated with distribution of party voting strength at the constituency level), now districts are not equally populated and the differences in population across districts is related to the partisan distribution of voting strength. We may think of these three examples as giving rise to pure forms of distributional, turnout and malapportionment-based partisan bias.

We may illustrate the first case, partisan bias in a legislature with equally populated districts and with identical turnout rates in each district, using a five-seat legislature. Imagine that there are two parties, Ds and Rs. Ds win two of the five seats, 100,000 to 50,000 each, and the Rs win three of the five seats, 80,000 to 70,000. Now, the Ds win their seats by a 2:1 ratio, while the Rs win theirs by only an 8:7 ratio. Clearly, the Rs are advantaged by this discrepancy in the average seat shares of the winning candidates of their party and those of the Ds. Indeed, in this example, the Ds get only 40 per cent of the seats even though they receive 54.7 per cent of the vote. Here, partisan bias is caused solely by the nature of the *distribution* of partisan voting strength across constituencies.

An illustration of the second case is based on turnout discrepancies across seven equally populated districts. We might imagine that the Ds win every seat they win by, say, 60,000 to 30,000; while the Rs win every seat they win by 80,000 to 40,000, i.e., turnout is higher in the areas where Rs do best, but the vote shares of all winners is the same, namely 2:1. If the Ds win four House seats while the Rs win three House seats, the Ds will have picked up their four seats with a total of 360,000 votes nationally, while the Rs will have picked up three seats with a total of 360,000 votes. Here, partisan bias in House outcomes is attributable to *differences in turnout rates* that act to favor the Ds.

An illustration of the third case is a five-constituency legislature with constituencies D and E exactly twice as populous as districts A, B, and C. Imagine that the Rs regularly win in A, B and C with 53.3 per cent of the vote (80,000 to 70,000) while the Ds regularly win in districts D and E with 53.3 per cent of the vote (160,000 to 140,000). Here the winner's average victory margin is uncorrelated with partisan vote share, and the turnout rate is the same in all districts. The Rs have 60 per cent of the seats in the legislature, even though their legislative candidates win only 520,000 votes, while those of the Ds win 530,000. Here, partisan bias is due simply to *malapportionment*.

The fact that there are three distinct sources for partisan bias that are not mutually exclusive gives rise to an important theoretical question in the study of electoral systems, namely "How can we develop an integrated theory of partisan bias that takes into account all three sources of such bias?" A number of authors have incorporated two of these three factors into a single model in a fashion that allows different effects to be separately estimated (see, especially, Gudgin and Taylor, 1979; Johnston, 1981; Taylor *et al.*, 1986; Jackman, 1994: Lee and Oppenheimer, 1997) but, as far as we are aware, no treatment exists that encompasses all three factors in this fashion. Our aim in this paper is to develop analytic tools to provide precise measurement of the *independent* impact of each of these three sources of partisan bias. Although developed independently, the approach we take is very similar to that in Jackman (1994).

Some notation is necessary to present our key results. We have deliberately chosen to separately represent raw votes (denoted by v's) and vote shares (denoted by p's). This makes our notation distinct from both that of Gelman and King (1994a) and Taagepera and Shugart

(1989). Also, although in this paper we present data analysis only for the case where there are two parties, we have expressed our results in a form that can be made applicable to the case where there are n parties competing. This makes for a more cumbersome notation but it also makes it easier to see how our results might generalize beyond the two-party case.

Let S be the size of the legislature, and N the number of separate constituencies.

We shall look initially only at legislatures all of whose members are elected from single-member districts, i.e., legislatures for which $S = N$.

Let s_{ij} be the number of seats won by party i in the jth district. Let S_i be the number of seats won by party i nationally,[7] i.e.,

$$S_i = \sum_j s_{ij}$$

Let v_{ij} be the number of votes won by party i in the jth district. Let V_i be the number of votes won (across all constituencies) by all candidates of party i, i.e.,

$$V_i = \sum_j v_{ij}$$

Let V be the total number of votes cast for legislative office, i.e.,

$$V = \sum_i V_i$$

Let p_{ij} be the proportion of votes won by party i in the jth district, i.e.,

$$p_{ij} = v_{ij} / \sum_i v_{ij}$$

If we have a two-party system, then i takes on values from the set $\{1, 2\}$.

Let P_i be the *average* proportion of the (two-party) vote (across districts) received by party i, i.e.,

$$P_i = \left(\sum_j p_{ij}\right) / S$$

Let R_i be party i's share of the *total* national *raw* vote, i.e., party i's share of the total votes won by that party's candidates across all the districts, i.e.,

$$R_i = V_i/V$$

Measuring the Distributional Element in Partisan Bias

The first source of partisan bias we wish to examine is that which springs from the nature of the distribution of partisan voting strength across constituencies. Such distributional differences may arise by the chance effects of geography or through intentional gerrymandering (e.g., Gudgin and Taylor, 1979; Johnston, 1981; Cain, 1985; Owen and Grofman, 1988).

All methods of calculating partisan bias have in common the need to specify each party's national share of the (two-party) vote as a baseline for calculating a seats–votes relationship from which bias is to estimated. It is important to recognize that even though both P_i (party i's vote share in each constituency averaged across all constituencies) and R_i (party i's raw share of the total vote) can legitimately be regarded as party i's national vote share, these two estimates of national party vote share are unlikely to be identical because they measure two different things. One, R_i, is based on *raw total votes*; the other, P_i, is based on *average vote shares at the district level*. Only if the district level turnout is totally uncorrelated with the distribution of party voting strength across constituencies (a special case of which would be that in which turnout levels are constant across all constituencies) will $R_i = P_i$. But we know that in the United States, for example, Democratic seats tend to have a lower turnout because Democratic identifiers are disproportionately lower turnout, lower income, and minority voters (e.g., Campbell, 1996; Grofman *et al.*, 1997).

Clearly, whether we use R_i or P_i as our national vote share value will directly affect our estimate of bias. Say, for example, we use P_i. If, instead, we had used R_i the effect would simply be to displace each x element on the seats–votes curve by an amount equal to $P_i - R_i$. But, in particular, this would mean that the seat share value when party i has a national vote share of 50 per cent would be displaced by an amount equal to $P_i - R_i$. But that is just another way of saying that *replacing P_i with R_i as our estimate of party i's actual national vote share should (if our statistical estimation procedure were perfect) act to increase the estimated partisan bias by the amount $P_i - R_i$*. This simple link between choice of measure of national vote share and estimated partisan bias is an important observation that we will make crucial use of in developing our integrated approach to the determinants of partisan bias.

Measuring the Turnout Rate and Malapportionment Elements in Partisan Bias

Before we can show how to develop an integrated approach to partisan bias that separately measures distributional, turnout-related and malapportionment-related effects, some further mathematical analysis is very helpful in clarifying the underlying nature of partisan bias in seats–votes relationships. We begin by offering alternative definitions of both P_i and R_i, in which we show that *both* can be represented as a simple weighted function of the p_{ij} values, i.e., as a simple weighted sum of party i's vote *shares* in each of the districts, of the general form

$$\sum_j (p_{ij} \times w^{(j)})$$

where the nature of the $w^{(j)}$ will, of course, be different for P_i and R_i, but will share the

characteristic that the weights are district specific. Later, we will show how an analogous representation as a weighted function of the p_{ij} values can be developed for a malapportionment-corrected measure of national party vote share. We will then use this malapportionment-corrected measure of national party vote share to derive an estimate of the nature of partisan bias due to malapportionment.

It is straightforward to represent P_i as such a weighted function. All we need do is take the weights to be

$$w^{(j)} = 1/S, \text{ for all } j$$

Here

$$\sum_j w^{(j)} = 1$$

This gives us

$$P_i = \sum_j \left(p_{ij} \times 1/S \right) = \left(\sum_j p_{ij} \right) /S$$

as desired.

Thus, we see that P_i may be defined as a weighted function of the p_{ij} values *in which each constituency is weighted equally (i.e., with weight equal to 1/S)*. Note also that, in calculating P_i as a weighted function of the p_{ij} values, *the appropriate weights for each district may be taken to be the ratio of the number of seats in that district (here one) to total seats in the legislature.*

Now we wish to show that R_i may also be defined as a weighted function of the p_{ij}, albeit with a different set of weights. To do so, some further notation is necessary.

Let us define the *ratio* of (two-party) turnout in the jth district to total turnout as $t^{(j)}$, i.e.,

$$t^{(j)} = \left(\sum_i v_{ij} \right) /V$$

and

$$\sum_j t^{(j)} = 1$$

Clearly, party i's share of the two-party raw vote is just the sum over all districts, j, of the quantities that consist of party i's share of the raw vote in each district multiplied by that district's share of the total raw vote. Thus, after some algebra, we obtain

$$R_i = Vi/V = \sum_j (p_{ij} \times t^{(j)})$$

This equation demonstrates that R_i may also be expressed as a weighted function of the p_{ij}. Here, the appropriate weights are the $t^{(j)}$ values, i.e., the appropriate district weights for calculating R_i as a weighted function of the p_{ij} can be defined as the *ratio of district raw turnout to total raw turnout*.

This way of thinking about both R_i and P_i shows that these measures can be expressed in a 'common language', where the difference between the two is a function of how we choose to weight. It is apparent that, in weighting constituencies equally, we neglect both turnout and malapportionment effects and have only distributional effects, while in weighting constituencies by turnout we incorporate turnout effects on partisan bias in addition to distributional effects.

While R_i captures both the distributional and turnout-related aspects of partisan bias, if national vote share is taken to be R_i in our calculation of the seats–votes curve (and features thereof such as swing and bias), we would not get separate measures of the impact of distributional and turnout-related factors on partisan bias—only a measure of combined impact. But we would like to be able to separate out the effects of these two factors. More generally, the question becomes: How can we specify the effects of all three factors—malapportionment, turnout rates, and partisan vote share distribution—on partisan bias in a way that allows us to separately estimate all three effects?

The approach to an integrated model of the three factors we develop below permits us to do so. In particular, when we let national party vote share be defined as P_i, rather than as R_i, the standard approach to bias pioneered by Tufte (1973) perfectly captures the concept of distributional bias in a fashion that excludes from consideration turnout and malapportionment effects. Thus, we can build our estimates of separate malapportionment effects and turnout effects *on top of* the analysis of distributional effects using the seats–votes curve that we have already created with P_i as our measure of national party vote share.[8]

Before we do so, we need to develop a malapportionment-corrected figure for national party vote shares. But it is easy to see how to do this. By analogy with the turnout-related weighting scheme, to establish a malapportionment-corrected figure, M_i, for national party vote shares, we simply weight the p_{ij} by $d^{(j)}$ = the ratio of raw population in the jth district to total raw national population, i.e., we set

$$M_i = \sum_j (p_{ij} \times d^{(j)})$$

Note that

$$\sum_j d^{(j)} = 1$$

We showed earlier that, when we change our measures of party i's national vote share, we are, in effect, adding or subtracting partisan bias equal to the difference between the two measures. To create an integrated approach we begin by calculating partisan bias as in Tufte (1973) or Gelman and King (1994a) in a seats–votes equation in which national vote share is taken to be P_i. *We take this measure of partisan bias to be our pure measure of partisan bias due to distributional effects.*

Because this method does not take into account differential turnout rates across constituencies or malapportionment effects, we can then *use the difference between M_i and P_i (i.e., $M_i - P_i$) as our measure of that aspect of partisan bias that can be taken to be purely malapportionment-related in nature.*

However, to calculate the pure turnout-related effect on partisan bias we must be more careful, because some (or even all) of the differences in turnout rates across districts may be due to malapportionment and we do not want to count these effects on partisan bias twice. For example, if $t^{(i)} = d^{(i)}$, i.e., if turnout rate differences are simply a function of differences in the population base in each district rather than actual differences in turnout rates across district populations, then we really have no independent turnout-related effects. Thus, if $t^{(i)} = d^{(i)}$, we would want a measure of the pure turnout rate-related effects that was zero. We will *use the difference between R_i and M_i (i.e., $R_i - M_i$) as our measure of that aspect of partisan bias that can be taken to be purely turnout-related in nature* after we have corrected for both distributional bias and malapportionment bias.

Note that, now, all three effects are independent of one another, and the sum of the three effects may be thought of as the total partisan bias caused by all three factors.

Now that we have established how to calculate each of the three components of partisan bias, in the next section we illustrate those calculations with data from US House and US Senate elections in the 1980s. It is important, however, to recognize that these three estimates of partisan bias make sense only when taken together. For example, the turnout-related bias we estimate is after we have controlled for other sources of bias and is different from what we might estimate were we simply to look at, say, the correlation between turnout in the district and partisan success.[9]

Illustrative Applications of the Procedures to Estimate the Three Determinants of Partisan Bias

US House and Senate Elections 1984, 1986, 1988

Hitherto, for purposes of simplicity, we have largely treated the three sources of partisan bias separately, but there is no reason why more than one such factor might not be present in a particular situation, nor need they all operate in the same partisan direction. Thus, in looking at US House and Senate elections we would wish to take into account not just the effects of population-based malapportionment, but also the impact of the nature of the distribution of partisan support across states and of the partisan consequences of differences in turnout across states.

For US House and Senate races in 1984, 1986 and 1988, Table 1 shows the three different measures of national vote share for the Democrats. It also shows the derived estimates for partisan bias of each of the three types. We use the Gelman and King (1994b) JudgeIt program to calculate partisan bias based on mean partisan vote shares, with all districts/states equally weighted. We use that estimate as our value for partisan bias due to distributional effects.[10]

Table 1. Three ways of estimating democratic national vote share and three aspects of partisan bias in 1980s US House and Senate elections[a]

Year	Chamber	P_i	M_i	R_i	Pure distribut. partisan bias	Pure malapport. partisan bias = $M_i - P_i$	Pure turnout partisan bias = $R_i - M_i$
1984	House	54.9	55.0	52.5	− 1.7**	0.1**	− 2.5**
1986	House	57.3	57.1	54.8	− 2.6**	− 0.3**	− 2.7**
1988	House	57.0	56.8	54.1	− 3.4**	− 0.3**	− 2.7**
1984	Senate	48.5	51.9	50.7	− 0.4 ns	3.4 ns	− 0.8 ns
1986	Senate	50.6	51.0	50.8	2.9 ns	0.4 ns	− 0.2 ns
1988	Senate	53.2	53.3	52.9	− 0.2 ns	0.1 ns	− 0.4 ns

[a]Positive values of bias are pro-Republican.
**Significant at the 0.01 level or less.

We then use $M_i - P_i$ as our measure of that aspect of partisan bias that can be taken to be purely malapportionment-related in nature, and we use $R_i - M_i$ as our measure of that aspect of partisan bias that can be taken to be purely turnout-related in nature after we have controlled for malapportionment.

The statistical significance of the partisan bias calculated from P_i, M_i, and R_i are also reported in Table 1. However, the latter two of these are calculated differently from the first. The statistical significance of the partisan bias using the P_i value is provided by the Gelman and King JudgeIt package. Since this bias is a mean value estimated from a simulation, there is an error variance associated with it. The significance level reported tells us the likelihood that the partisan bias attributed to distributional effects is nonzero.[11] In contrast, the statistical significances of the malapportionment bias and of the turnout bias are calculated using a difference of means test. For each district (or state) for each year we have an observed p_{ij} value, and observed values for $p_{ij} \times d^{(j)}$ and for $p_{ij} \times t^{(j)}$. If we neglect the issue of the up-to-datedness of the population figures for the different constituencies, all three of these values are actual values, not estimates. The significance reported for the $M_i - P_i$ column is the likelihood that the mean value of the p_{ij} is different from the mean value of the $p_{ij} \times d^{(j)}$ distribution. Similarly, the significance reported for the $R_i - M_i$ column is the likelihood that the mean value of the $p_{ij} \times t^{(j)}$ distribution is different from the mean value of the $p_{ij} \times d^{(j)}$ distribution.

We see from Table 1 that there is statistically significant partisan bias in the House that can be attributed to the geographic distribution of partisan vote shares, but that the findings on distributional bias for the Senate are not statistically significant.

We also see from Table 1 that for the House there is statistically significant partisan bias that can be attributed to malapportionment, although the actual magnitude of this bias is not especially large. However, for the Senate there is no statistically significant malapportionment bias. Indeed, with the exception of 1986, the partisan bias effects that might be attributed to Senate malapportionment are not that large. This may seem too implausible, given the dramatic malapportionment that exists in the US Senate, but, as noted earlier, we need to distinguish between malapportionment, *per se*, and malapportionment that generates partisan bias. In these

Senate elections there simply is no strong link between a state's population and how well either party does in that state.

Lastly, we see from Table 1 that there is a substantial and statistically significant partisan bias in the House due to turnout rate differences across constituencies. The Democrats are the beneficiary of this bias, i.e., Democrats win their seats, on average, in districts with lower levels of turnout than is the case for Republicans. This is the 'cheap seats' phenomenon that Campbell (1996) called attention to. However, for turnout-related bias, as with the other two potential causes of partisan bias, we find no statistically significant results for the Senate.

Of course, the fact that the n for the Senate is only 33 or 34 diminishes the likelihood of statistically significant effects. Nonetheless, even when we pool Senate data for the four years from 1984 to 1988 to raise our n to 100, we still get nonsignificant results for distributional bias. Moreover, even for this pooled data we still get statistical nonsignificance for partisan bias effects due to malapportionment or turnout as well.

If we look at the combined effects of all three sources of partisan bias over the 1984–1988 period we see that, by and large, in the House, they tended to reinforce one another to create a pro-Democratic bias. In the Senate, in contrast, they tended to work in a pro-Republican direction. Thus, we would expect that, in this period, the Senate would be more Republican in composition than the House—and it was.

US Presidential Elections 1984 and 1988

While we presented our analysis in the previous section solely for the case of single-member districts, it is straightforward to generalize it to districted systems with a mix of single- and multi-member districts or, analogously, to weighted voting systems like the US electoral college. We replace the weight $1/S$ in our earlier formula with $s^{(j)}/S$, where $s^{(j)}$ is simply the number of seats elected from the jth constituency. We apply this extension to calculate the three aspects of partisan bias in the US electoral college in 1988. Table 2 shows data for the presidential election of 1988 paralleling that in Table 1 for House and Senate elections.

We see from Table 2 that, in the electoral college, unlike what we found for the House, none of the three effects have any statistically discernible impact on partisan bias. This, too, is a surprising finding considering how much has been written about supposed (pro-Republican) bias in the electoral college of that period. Elsewhere (Grofman *et al.*, forthcoming) we show why partisan bias in the electoral college has generally been overestimated.

Table 2. Three ways of estimating democratic national vote share and three aspects of partisan bias for the US electoral college 1984 and 1988[a]

Year	Equally weighted states estimate of Democrat. vote share	P_i (electoral college)	M_i	R_i	Pure distrib. partisan bias	Pure malapport. partisan bias = $M_i - P_i$	Pure turnout partisan bias = $R_i - M_i$
1984	39.7	40.5	40.6	40.8	− 0.8 ns	− 0.1 ns	0.2 ns
1988	46.0	46.0	46.0	46.0	− 1.7 ns	0.0 ns	0.0 ns

[a]Positive values of bias are pro-Republican.
**Significant at the 0.01 level or less.

Discussion

When we think of partisan bias as having the three explanatory factors of partisan distribution of vote share, population malapportionment, and party-specific differences in turnout rates that translate into constituency-specific differences in turnout rates, we are in a position to resolve a long-standing dispute in the literature on elections about whether P_i, or R_i should be used to measure national vote share. Some authors (e.g., Gudgin and Taylor, 1979; Campbell, 1996) argue for the latter, while most authors who have made use of seats–votes measures of bias (e.g., Grofman, 1983; Cain, 1985; Campagna, 1991; Brady and Grofman, 1991a; Gelman and King, 1994a) use the former.

The way to resolve the dispute is to recognize that, as we demonstrated earlier, when bias is calculated simultaneously with swing ratio in a formulation in which each party's vote share nationally is calculated as the *average* of its partisan vote *share* in each constituency (which, in effect, weights all constituencies equally), bias so calculated becomes a *pure* measure of bias of the first type, i.e., of distributional bias. In contrast, when bias is calculated simultaneously with swing ratio in a formulation in which each party's national vote share tally is taken to be its share of the *total* vote cast for its party's candidates for that office (which, in effect, weights each constituency by the constituency's proportion of the total national turnout), bias as so calculated is a *combined* measure of bias of the first and second and third types. Thus, controversy in the electoral systems literature as to which of these two methods is the 'correct' method for calculating partisan bias is misguided. Both can be said to be 'correct'; they simply measure different things.

Nonetheless, as we previously argued, use of P_i is preferred, since it is an uncontaminated measure of distributional effects. Of course, we must also recognize that use of P_i does not capture turnout rate-related or malapportionment-related effects, and thus, if we use P_i as our measure of national vote share, we need to separately account for these effects. Showing how this can best be done has, of course, been the central point of this paper.

We have demonstrated that it is possible to separately estimate turnout, malapportionment and distributional effects on partisan bias and that, for US elections, these do not necessarily all go in the same direction or operate with the same magnitude in different electoral contexts. We did see, however, that in the House, the sum of these three sources of partisan bias tended to reinforce a Democratic advantage in that body. The results shown in Table 1 are consistent with an important empirical phenomenon in the 1980s, namely the fact that, in this period, the Democrats did better for the House than for the Senate. We saw that distributional bias for the House is pro-Democratic and the only large distributional bias estimate for the Senate is in a pro-Republican direction. Similarly, we found both strong and statistically significant partisan bias in favor of the Democrats in the House in terms of bias that could be attributed to turnout differences. In the House, only with respect to malapportionment-related bias were there no biasing effects that were both statistically significant and strongly in favor of the Democrats.

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Notes

1. Since the publication in 1973 of Tufte's seminal article, numerous authors have approached the analysis of seats–votes relationships in two-party systems by looking at the twin concepts of partisan bias and swing ratio (e.g., Niemi and Deegan, 1978; Grofman, 1983; Brady and Grofman, 1991a; Cain, 1985; King and Browning, 1987; Campagna and Grofman, 1990; Campagna, 1991; Niemi and Jackman, 1991; King and Gelman, 1991; Garand and Parent, 1991; Gelman and King, 1994a). There are several different methods for simultaneously calculating swing ratio and bias, but two are most important. The first is the log-odds method developed by Tufte (1973) and used by many subsequent authors (e.g., Campagna, 1991; Brady and Grofman, (1991a, b)). The second is the averaging technique developed by King and Gelman (1991) and instantiated in the computer program JudgeIt used by these authors (Gelman and King, 1994a, b) and by a number of others (e.g., Garand and Parent, 1991).
2. Customarily, in two-party competition, both swing ratio and the distributional aspect of partisan bias are estimated at a (hypothetical) vote share of 50 (Tufte, 1973), or for a range of vote shares relatively near to 50 per cent and symmetrically distributed around that point. In this paper, following Gelman and King (1994a, b), we estimate values over the 0.45 to 0.55 vote share range. Swing ratio and bias can also be specified at any point on the seats–votes curve or averaged across any range of points (Grofman, 1983), but we shall neglect such complications here. In a two-party contest, the bias for party A is simply the negative of the bias for party B.
3. We shall consider only two-party contests in this paper, although the concepts of swing ratio and bias can both be generalized to multi-party competition. Grofman (1975), Taagepera and Shugart (1989) and Lijphart (1994) discuss the seats–votes relationship across other types of electoral systems.
4. Clearly, the concept of malapportionment needs to be defined with respect to some basis. In the United States, unlike most other democracies, apportionment is on the basis of total population (persons) rather than on the basis of citizen population or potentially eligible electorate (e.g, citizen voting age population) or registered voters or past turnout. Obviously, the choice as to the basis for apportionment can have important implications for what we conclude about the presence or absence of malapportionment (e.g., Grofman, 1992; Scarrow, 1992). In the remainder of this paper, except where otherwise indicated, the reader may take the word 'population' as a generic term, referring to whatever may be the basis of apportioning seats in the country under investigation. Since the actual data we analyze are from the United States, this usage should not be a cause of confusion.
5. By turnout rate we mean the ratio of votes cast to the apportionment base in the district. Obviously, the actual number of voters will not be the same as the apportionment base. Implications of that fact for the equity of representation have been discussed by a number of authors (for a review of the US debate see Brace *et al.*, 1988; Grofman, 1992).
6. Recall that we use 'population' as a generic term to refer to the basis of seat apportionment.
7. For simplicity, here we shall act as if the legislature we are analyzing is a national parliament. Exactly the same analyses go through for state or regional legislatures as well.
8. Campbell (1996) has identified a phenomenon that he refers to as 'cheap seats', in which one party wins its seats with fewer raw votes per victory, on average, than does the other party. He argues that the party that has the cheap seats is advantaged in terms of partisan bias. But the cheap seat phenomenon may arise in one or more of three ways we have previously identified. As with calculating bias via an equation in which national vote share is defined as R_i, the method proposed by Campbell to calculate the partisan bias caused by cheap seat effects (a method that calculates a function of the difference in each party's average total wasted votes) actually measures the combined impact of all three of these factors (distributional differences, apportionment differences, and turnout rate differences) in such a fashion that the independent impact of the factors cannot be disentangled.
9. Also, even if we eliminated malapportionment and turnout-related bias, as long as we still permitted distributional bias to come into play there are many districting plans which will yield the same raw vote totals but which will differ greatly in their partisan consequences. Moreover, it may in practice be impossible to redraw district boundaries so as to ensure both equal turnout and equal population.
10. For the House our estimates are different from those given in King and Gelman (1991) because we do each election separately and only use the actual election outcomes as input rather than attempt to estimate a predictive multiple regression equation based on election data from a longer time period.
11. For example, the House distributional bias figure of − 1.7 reported in Table 1 has an associated

standard error of 0.44. Since this value is almost five times its standard error, the estimate is significant at well above the conventional 0.01 level.

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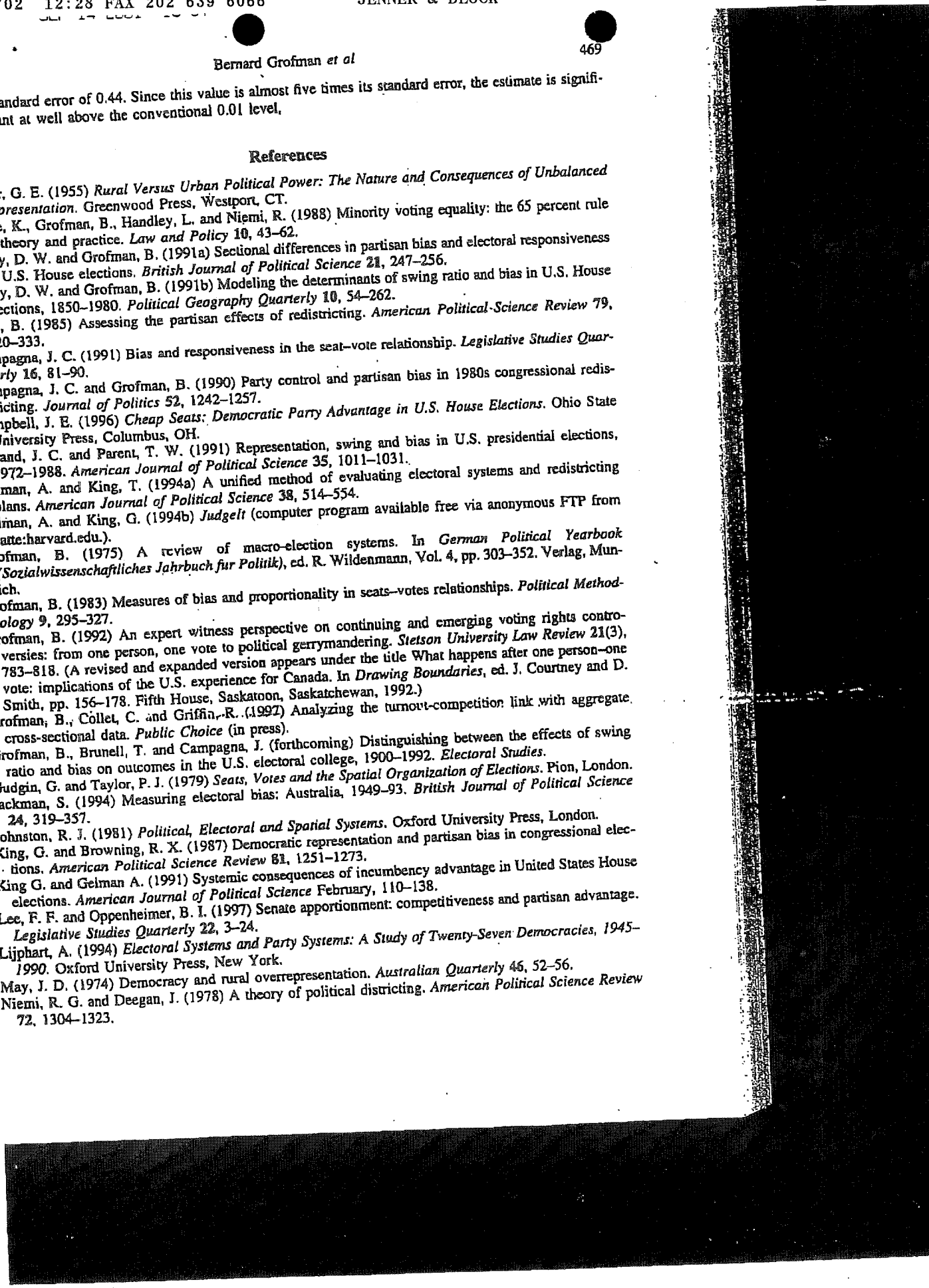

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SUPPLEMENTAL ANALYSIS OF PARTISAN BIAS
BY
THOMAS L. BRUNELL

I reviewed the partisan bias sections in the reports of Professors Lichtman and Katz, and I thought it would be useful to test their conclusions using methods similar to those used by Professor Katz. Instead of using Congressional elections results, which have complications of incumbency and variance across races in terms of campaign finance, candidate quality, and a whole host of other variables, I used statewide election results to calculate the relationship between seats and votes. Thus, each voter in every congressional district is voting on the exact same race. Examining the data this way avoids the problems and complications faced by using Congressional election data.

Figure 1. The "Cube Law," Hypothetical Relationship Between Seats and Votes in a Single Member District, Plurality Electoral System

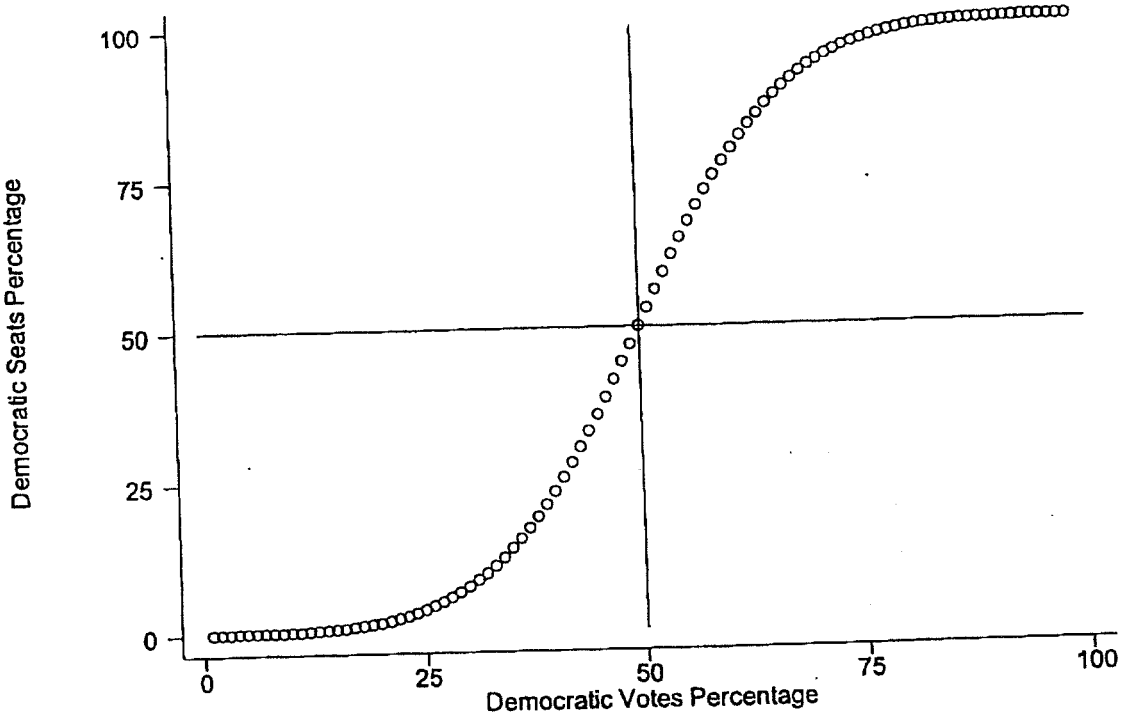

Figure 1 depicts a hypothetical relationship between seats and votes. It displays the relationship between seats and votes in an electoral system in which outcomes are described by the "cube law." This is a reasonable description of the relationship between seats and votes in a single member district system like the one at work for U.S. Congressional elections. The vote share is on the x-axis and the seat share is on the y-axis. Moving from left to right horizontally, as the proportion of a party's share of the vote over all districts increases, so too does their share of the seats. However, in a single member district system like the one in the United States, this relationship is not strictly linear. The rate at which the proportion of seats changes varies drastically. For instance, a party that gets 20 percent of the votes statewide can reasonably expect to get nearly

zero percent of the seats.[1] This is easy to imagine, particularly if the party gets exactly twenty percent of the vote in every single district. If a party receives less than 50 percent of the vote they can count on winning proportionally fewer seats relative to their share of the vote. The obverse is also true. The party that wins a majority of the votes, let's say 55 percent of the vote overall, can count on getting an even greater share of the seats. In this hypothetical relationship, the party that gets 55 percent of the vote receives nearly 65 percent of the seats.

It is important to note that the line cross the point at 50-50. That is, if the two parties split the vote 50-50, they also each get 50 percent of the seats. The political science literature refers to deviations from this ideal as "partisan bias." If a party gets 55 percent of the seats with only 45 percent of the votes (which means the other party gets a majority of the votes and less than a majority of the seats) then the plan is not fair to each of the parties. There is an inherent bias in the plan that favors one party, at the expense of the other party. Thus, we expect in a plan fair to both parties for all of the "dots" which each represent one election to be in either the upper right quadrant or the lower left quadrant. Both of those quadrants represent the area of the graph in which a majority of the congressional districts were won by the party that also received the overall majority of the votes. This is known as the majoritarian principle.

We can examine the seats votes curve under the current congressional district map, as well as some of the proposed districts as well. I asked the Texas Legislative Council (TLC) to provide me with data for all statewide elections in Texas from 1992-2000 broken down by Congressional district for the current plan as well as for some of the proposed plans before the Court. In order to create these graphs the following set of tasks were carried out:

1) Take the statewide Democratic Party share of the two-party vote in percentage terms. Which means this is done by dividing the number of votes for the Democratic candidate by the sum of the number of votes for the Democrat and the number of votes for the Republican. So the 1992 vote share for Clinton in Texas is not 37.1 percent, which is his overall share of the vote, but 47.4 percent of the two-party vote (Clinton received 2,265,878 votes, while President Bush received 2,484,116 votes).
2) Count the number of districts in which the Democratic candidate received a majority of the votes (or a plurality in the case of a three-person race).
3) Divided the number of congressional districts won by the Democrat by the total number of congressional districts (30 in the case of the current plan, and 32 districts for the proposed plan).

All of the graphs that follow are based on the 48 statewide votes in Texas between 1992 and 2000 (this includes Presidential election results in Texas). Results show that the current plan is systematically biased in favor of the Democrats. The graphs also indicate a pro-Democratic bias in plans 1021, 1040, and 1048. Of the plans examined, 1046 is the only plan that adheres to the majoritarian principle and indicates no discernible partisan bias for either party in the statewide election data between 1992 and 2000.

[1] This is roughly what happened to Ross Perot in the 1992 Presidential campaign. He received nearly 20 percent of the vote nationwide, yet he did not win a single Electoral College vote, because he failed to get a plurality of the popular vote in any single state.

Figure 2. Seats-Votes Curve for Current Congressional District Lines (Plan 1000)

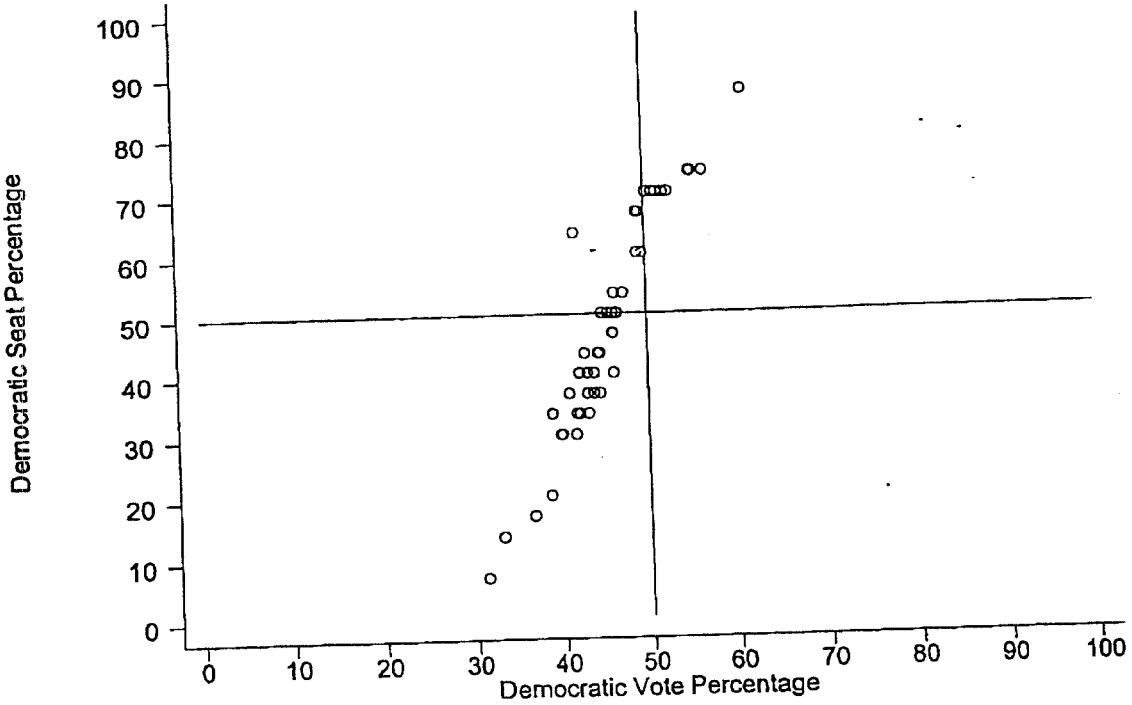

Figure 3. Seats-Votes Curve for Speaker Laney's Proposed Congressional District Lines (Plan 1021)

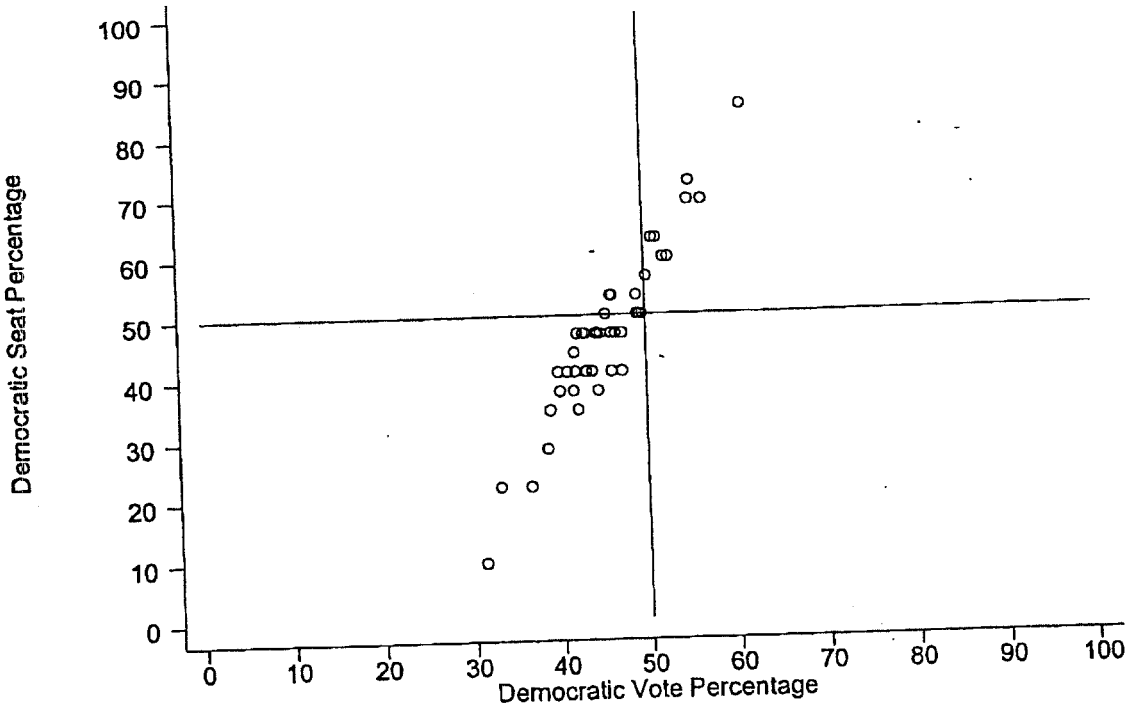

Figure 4. Seats-Votes Curve for Malcolm et al.'s Proposed Congressional District Lines (Plan 1040)

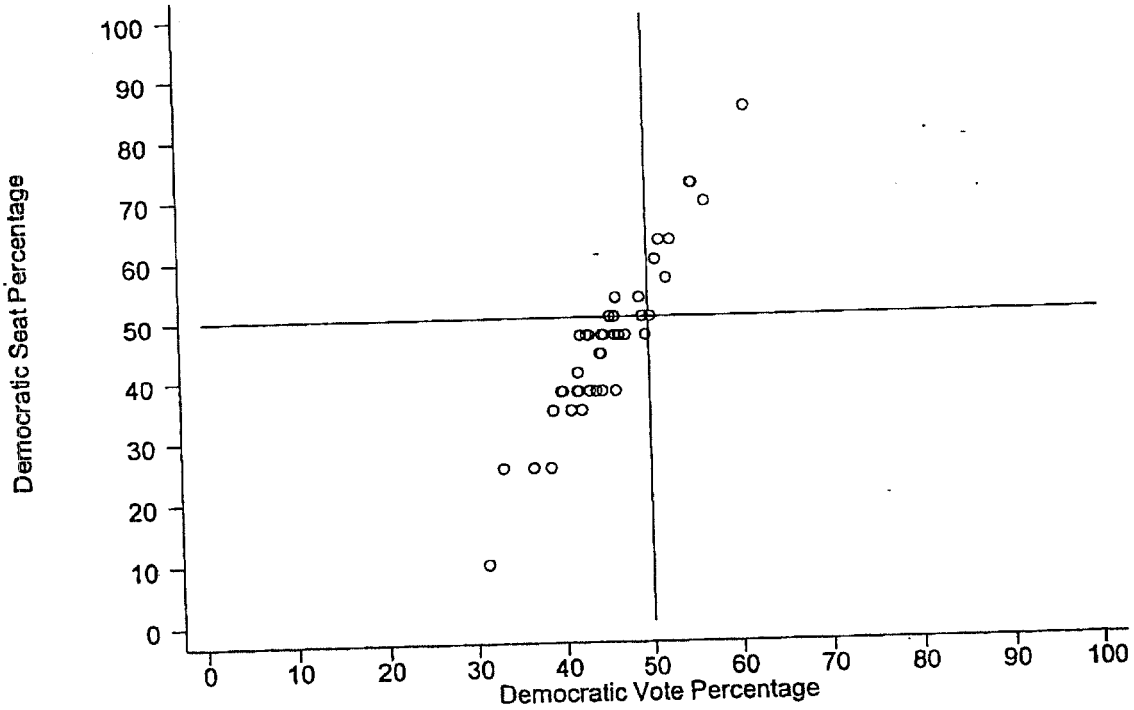

Figure 5. Seats-Votes Curve for MALDEF's Proposed Congressional District Lines (Plan 1048)