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Bernard Grofman

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This article critiques the views of Freedman et al. and Clark and Morrison on questions having to do with the applications of social science methodology in the law, including statistical techniques to measure racial bloc voting and techniques to estimate the Spanish-origin percentage of registered voters. It is argued that these authors misunderstand the case law in the voting rights area and have unrealistic standards of precision that, if adopted, would make it virtually impossible for minority plaintiffs to successfully prosecute a voting rights claim.

STATISTICS WITHOUT SUBSTANCE

A Critique of Freedman et al. and Clark and Morrison

BERNARD GROFMAN

University of California, Irvine

In *Garza v. County of Los Angeles Board of Supervisors*, a group of Hispanics, represented by the Mexican-American Legal Defense and Educational Fund, and the U.S. Department of Justice, as plaintiffs in a consolidated suit, sued the County of Los Angeles on the grounds that district lines for the five members of the county's Board of Supervisors had been drawn in such a fashion that Hispanic voting strength had been fragmented and diluted in a fashion that violated Section 2 of the Voting Rights Act of 1965 as amended in 1982. For plaintiffs to prevail they would need to show either that the challenged plan had had *discriminatory effects* or that it was *intentionally discriminatory*. The former required a showing that the Hispanic population whose fragmentation was alleged was large enough for Hispanics to have a legal claim of vote dilution, that voting patterns in the county reflected voting along Hispanic versus non-Hispanic lines, and that Hispanic candidates for supervisory positions regularly lost (and/or that

AUTHOR'S NOTE: *Much of the material in this article is adapted from the author's testimony on behalf of the U.S. Department of Justice in Garza v. County of Los Angeles Board of Supervisors. The views expressed are solely the author's own.*

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viable Hispanic candidates were deterred from running by the way in which district lines had been configured). Alternatively, plaintiffs could prevail if they were able to convince the court that there had been deliberate discrimination against Hispanics in the way that district lines had been drawn. Both effects and intent questions were subject to debate, both legal and empirical.

Each side began with a legal theory of the case and sought to produce expert witness testimony that would allow it to prevail *if* the court accepted its claims as to what type of evidence a finding of statutory violation of the Voting Rights Act required. Each side also sought to introduce evidence to rebut the testimony supporting the data underpinnings of the other side's legal theory of the case. Disputes about the size and geographic dispersion of the Hispanic population and about the uses of Spanish-surname data in estimating Spanish-origin registration pitted demographers testifying on behalf of the county (including Dr. Clark) against demographers (including Drs. Estrada and O'Hare) and a political scientist (the author) testifying on behalf of the plaintiffs. Disputes about the nature of Hispanic and non-Hispanic voting behavior pitted statisticians (and an educational psychologist) testifying for the county (Drs. Freedman, Sacks, and Klein) against a quantitatively trained political historian (Dr. Lichtman) and the present author. Disputes about intentional discrimination required the court to compare the recollections of elected officials and their staffs with a historian's reconstruction of the historical record. This article deals exclusively with the first two disputes, those involving demographic and political science issues, because there are the issues dealt with by the Freedman et al. (1991) and Clark and Morrison (1991) articles in this issue. I should note, however, that at the appellate level, the case was decided on grounds of intent, with one judge characterizing the trial record as showing "smoking gun" evidence of intent to discriminate. As a consequence, the appellate court found no need to review the lower court's findings on the plan's discriminatory effects. The lower court had found for the plaintiffs on both effects and intent grounds.

At the trial, there were four critical demographic issues. The first was the definition of the plaintiff class. The Department of Justice took the legal position that persons of "Spanish heritage" (the term used in the Voting Rights Act) was effectively synonymous with persons of "Spanish origin," as determined by self-identification on census questionnaires. Experts for the plaintiffs presented all their analyses in terms of members of this latter group, and most used "Hispanic" (or "Latino") simply as a shorthand of "person of Spanish origin." The county took the legal position that not all Spanish-origin persons in Los Angeles ought to be counted as members of the plaintiff class. During the trial, one expert for the county testified that the term Hispanic

was not accepted by all persons of Spanish origin, while Dr. Morrison testified that Cubans, Filipinos, and people born in Spain ought to be subtracted from the number of persons of Spanish origin in the county because of socioeconomic and other differences between them and the rest of the county's primarily Mexican-American population.

The second key demographic issue at the trial had to do with the dispute over what proportion of the Spanish-origin population was eligible to vote, in particular, over how many Spanish-origin persons over the age of 18 were citizens. Experts for the plaintiffs took the position that 1980 citizenship figures should be taken from official census tabulations. Experts testifying for the county took the position that there were particular statistical corrections to these 1980 Census estimates that should be used. These corrections led to a reduced estimate of the number of Hispanic citizens.

The third key demographic issue was over the reliability and the appropriateness of use of postcensal estimates of total population and racial and ethnic breakdowns that had been generated by the county itself for planning purposes. The county took the legal position that such estimates were legally irrelevant, asserting that only 1980 population and citizenship mattered for a vote dilution showing. This legal claim was rejected by the plaintiffs, who used postcensal estimates to show Hispanic growth over the course of a decade. Some experts for the county attacked the validity of the postcensal estimates, while experts for the plaintiffs defended their greater current (1989-1990) reliability as compared to the "stale" 1980 Census data.

A fourth key issue had to do with the uses of Spanish-surname registration data. Experts for the plaintiffs developed a methodology to estimate Spanish-origin registration in any given year from the list of registrant names. This methodology was based on tract-specific surname-to-origin matchups involving self-identified Spanish-origin voting-age citizens. Experts for the county challenged the reliability of this methodology. They also challenged the claim made by the present author that the proportion of Spanish-origin voting-age citizens within certain heavily Hispanic supervisorial districts that had been proposed by the plaintiffs could be expected to exceed the proportion of Spanish-origin registered voters in that district; thus districts shown to have a 50% or greater Spanish-origin registration could be expected, a fortiori, to have a 50% or greater Spanish-origin citizen voting-age population.

All of these issues had to do with measuring the size of the plaintiff class, which, if reduced far enough, would buttress the county's legal argument that there were not enough Hispanics to have a legal claim under the Voting Rights Act.

The first issue was taken by the trial court to be a matter of law, not demography. Judge Kenyon, following well-established precedents, took Spanish-origin self-identification from the census as the defining characteristic of individuals of Spanish heritage protected under the Voting Rights Act. Thus I confine my attention to the last three demographic issues, each of which is discussed in the Clark and Morrison article.

At the trial, there was really only one issue having to do with the voting behavior of Hispanics and non-Hispanics in Los Angeles, namely, whether there was credible evidence that, when given the option to vote for a viable Hispanic candidate, Hispanics preferred Hispanic candidates to non-Hispanic candidates and non-Hispanics did not. Experts for the county answered this question in the negative; the plaintiffs' experts (Dr. Lichtman and myself) answered it affirmatively. Experts for the county generally took the position that Lichtman and I failed to understand the nature of statistical models and inappropriately applied statistical techniques such as ecological regression and homogeneous case analysis. If sufficient doubt could be cast on the plaintiffs' claims that if a viable Hispanic candidate were running, voting could usually be expected to be polarized along Hispanic-non-Hispanic lines in nonpartisan contests (such as those for supervisor), the county would win the litigation. This issue is the central topic of the Freedman et al. article.

For purposes of discussion, I divide the arguments in Freedman et al. and Clark and Morrison into three categories: claims about legal standards in voting rights cases, discussion of demographic issues and discussion of issues in measuring racial bloc voting.

LEGAL ERRORS

Both Freedman et al. and Clark and Morrison mischaracterize the legal requirements for districting and the applicable Section 2 standards. First, Freedman et al. (p. 674) and Clark and Morrison (p. 714) each assert that for a group to have a claim under Section 2 of the Voting Rights Act of 1965 as amended in 1982, it always *must* be demonstrated that the group is sufficiently large and sufficiently geographically concentrated so that a district could be drawn in which its members comprise a *citizen voting-age majority*. That claim is wrong as a matter of law.

Second, Clark and Morrison (p. 713) asserted that for the Los Angeles County Board of Supervisors, the "one person, one vote" rule is a requirement that five districts be drawn with equal numbers of *voting-age citizens*.¹ As a matter of law, that claim, too, is simply wrong.

Third, Clark and Morrison left the reader with the erroneous impression that the use of noncensus data is never permitted in redistricting.

The issues of total population versus voting-age population and of apportioning on the basis of persons rather than citizens can have important consequences for minority representation because, in general, minority groups such as Blacks, Asians, and Hispanics have a lower proportion of persons of voting age than does the White/Anglo population, and the latter two groups have a much lower proportion of citizens than is true for the White/Anglo population. Moreover, in some jurisdictions, the proportions of voting-age Hispanics or Asians who are citizens is lower than the proportion of all Hispanics/all Asians who are citizens, since children born in the United States become U.S. citizens.

A REALISTIC OPPORTUNITY TO ELECT CANDIDATES OF CHOICE

Turning to the first point, while Freedman et al. and Morrison and Clark may believe the law *ought* to require numbers sufficient to create a citizen voting-age majority district before a group has a cognizable claim under the Voting Rights Act, given the denial of certiorari on *Garza* by the Supreme Court of the decision of the Ninth Circuit in that case and similar precedents in other circuits, that is certainly not what the law *is*. Some background may be useful.

Following the language of the Senate Judiciary Committee Report on the 1982 extension of the Voting Rights Act of 1965, Justice Brennan, delivering the opinion of the Supreme Court in *Thornburg v. Gingles* (1986), the leading voting rights case to date, advocated a "functional" view of the political process," where courts are to "conduct a searching and practical evaluation of reality" (p. 66). While Justice Brennan's discussion in *Thornburg* (pp. 50-51 n. 17) suggests a test based on *potentially eligible* voters, that is, voting-age population or citizen voting-age population, his language also suggests that what is relevant is a functional test of whether minorities have been denied a realistic opportunity to elect candidates of choice. In his words: "Unless minority members possess the *potential* to elect representatives in the absence of the challenged structure or practice, they cannot claim to have been injured by that structure or practice" (pp. 50-51 n. 17, emphasis in original). Moreover, as Justice O'Connor asserted in her concurring opinion in *Thornburg* (joined by three other Justices), "If a minority group that is not large enough to constitute a voting majority in a single-member district can show that white

support would probably be forthcoming in some such district to an extent that would enable the election of candidates its members prefer, that minority group would appear to have demonstrated that . . . it would be able to elect some candidates of its choice” (pp. 89-90 n. 1).

A majority of *voting-age population* was the threshold used by the lower court in *Gingles v. Edmisten* (1984) to evaluate proposed remedy plans. It was also the standard used in a number of cases decided subsequent to *Thornburg*, in which questions as to potential to elect raised by substantial noncitizen populations were not salient. In *Romero v. City of Pomona* (1989), a case involving Hispanics, the appellate court found that the minority was not numerous enough to constitute a *citizen voting-age majority* in at least one district and held that no valid Section 2 claim had been raised. However, in *Romero*, no argument was offered that even though not constituting a majority of the eligible electorate, the minority group nonetheless had a realistic opportunity to elect candidates of choice. Moreover, in that opinion, the court also says “[l]ess than a majority, of course, might suffice, in a district where candidates are elected by plurality” (p. 1424 n. 7; for further discussion on this point, see Karlan 1989).

In *Garza v. County of Los Angeles Board of Supervisors*, the District Court looked at total population figures, Spanish-surname registration figures, and the success rates of Hispanic candidates as a function of Spanish-surname registration and found the evidence compelling that even though no district could be drawn with a citizen voting-age majority in 1981, a supervisorial district could have been created in which Hispanic voting-age citizens had the potential to elect the candidate of their choice. The court then asserted that “it would be myopic, on these facts and circumstances, for the Court to apply the bright line 50 percent requirement” (p. 6). I should also note that the citizen voting-age population issue was largely mooted by the fact that there was agreement by all experts (including Dr. Clark) that both the remedy plan eventually proposed by the County and the remedy plan proposed by the plaintiffs that was adopted by the Court did in fact contain a Hispanic citizen voting-age majority *as of 1990*.

The District Court also pointed out that

for practical purposes, decennial census counts of voting age citizen population cannot be an exclusive measure of geographic compactness. Total population data and voting age population data are available for redistricting promptly after the decennial census is taken, while citizenship data is not released until several years later. . . . Many jurisdictions, including Los Angeles County, will be legally required to complete their redistrictings before citizenship data becomes available after the 1990 Census. (Pp. 54-55)

On appeal, in the same circuit in which *Romero* was decided, the Ninth Circuit said about this issue that whatever may be the meaning of the *Thornburg* threshold when no showing of intentional discrimination has been made

to impose the requirement [a citizen voting age majority] that the County urges would prevent any redress for districting which was deliberately designed to prevent minorities from electing representatives in future elections governed by that districting. *This appears to us to be a result wholly contrary to Congress' intent in enacting Section 2 of the Voting Rights Act and contrary to the equal protection principles embodied in the fourteenth amendment.* . . . [In Los Angeles,] continued fragmentation of the Hispanic population had been at least one goal of each redistricting since 1959. (90 C.D.O.S. 8138 at 1840)

THE "ONE PERSON, ONE VOTE" STANDARD

Turning to the second legal claim, the assertion by Clark and Morrison (p. 714) that for the L.A. County Board of Supervisors the "one person, one vote" standard *must* be interpreted as requiring districts that are equal in citizen voting-age population, that claim has never been accepted by any court (*Burns v. Richardson* 1966) and was specifically rejected in the L.A. County case at both the trial and the appellate level, although it did meet acceptance by Judge Kozinski in his dissenting appellate opinion in *Garza*. As the Ninth Circuit majority opinion said with respect to this issue: Basing districts on voting population rather than total population would "abridge the rights of aliens and minors to petition that representative. For over a century, the Supreme Court has recognized that aliens are 'persons' within the meaning of the fourteenth amendment to the Constitution, entitled to equal protection. This equal protection right serves to allow political participation short of voting or holding a sensitive public office" (p. 8142, internal citations omitted). Moreover, virtually all jurisdictions at all levels of government use total population as the basis of reapportionment. If only citizens counted for apportionment purposes, then the representation of Hispanics (and also Asians) would be dramatically diminished.

USE OF POSTCENSAL ESTIMATES

The notion that it was legally improper for the county to redistrict using population estimates is wrong. The county is statutorily authorized to do so and had engaged in intracensal redistricting at several times in the past. The California Elections Code (Section 35000) reads in part:

At any time between the decennial adjustments of district boundaries, the board may cause a census of the County to be taken as provided in Section 26203 of the Government Code, and may adjust the boundaries of the Supervisorial districts on the basis of that census, or on the basis of population estimates prepared by the State Department of Finance or the County planning department or planning commission.

METHODOLOGICAL ERRORS IN THE USE OF DEMOGRAPHIC DATA

Clark and Morrison and Freedman et al. made certain misleading claims about the use of demographic data in the Los Angeles County case and in some instances asserted that their views were either the legally or demographically correct position in all vote dilution cases. Specifically, Clark and Morrison (a) suggested that the postcensal data used in the L.A. case was unreliable, (b) argued that U.S. Census figures (PUMS) on the percentage of Spanish-origin citizens in Los Angeles County at the tract level should have been replaced with estimates derived by substituting national estimates of citizen misreporting and that this should be done as a general practice in all voting rights cases, and (c) implied (p. 724 n. 7) that reliable estimates of Hispanic registration were not available in Los Angeles because of problems in using Spanish surname as a proxy for Spanish origin and appeared to assert that the proportion of Spanish-surname registrants would in general overstate Hispanic voting strength in areas of heaviest Hispanic concentration. (The reason why I say "appeared to assert" is that the language in Note 8 completely neglected the problem that surname-to-origin matchups involve both Type I and Type II errors.)

POSTCENSAL ESTIMATES

Clark and Morrison suggested that postcensal (1985, 1987, and 1989) estimates or projections generated by the County of Los Angeles and by the State Board of Finance ought not to be used, and they allude in a footnote to the "experimental" nature of the data.

In my view, postcensal population estimates generated by the county for planning purposes (known as PEPS) are a more accurate indicator than the 1980 Census of *current* conditions in Los Angeles County, given the dramatic changes in the county's population over the course of a decade. Legally, that is all that need be shown. It is important to emphasize that nothing in the Los Angeles County case involved a repudiation of any 1980 Census figures, merely a recognition that there were better population estimates available for

the county's 1989 or 1990 population. It is hard for me to see much to argue about in the trial court's acceptance of PEPS data. Indeed, *the county's own witness*, demographer Nancy Minter, who supervised most of the work in preparing the PEPS estimates, testified that in her opinion, "*the 1985 PEPS estimates are a more accurate reflection of current population in Los Angeles County than the 1980 census* at the countywide level and when the tract data is aggregated, to the supervisorial district level" (Garza 1990, p. 51, emphasis added), and Clark himself used the PEPS data to draw remedial plans for the county (also see O'Hare 1991, this issue). A tremendous amount of time and research had been devoted by the county to the development of the PEPS methodology, which had already gone through several iterations and was not something created for trial purposes. Because of the efforts that went into its preparation, and because it is being used only for a redistricting occurring very late in the decade in an area of the country known to have undergone tremendous population growth, its acceptance in the *Garza* case does not commit courts to any general acceptance of population estimates in other jurisdictions or other circumstances. Courts have long recognized that there may be circumstances in which it is appropriate to take into account population shifts. As Judge Kenyon said in the *Garza* case, plaintiffs "need not demonstrate that the Census is inaccurate," they need merely show that "there have been significant demographic changes since the decennial census and that there exists post-decennial population data that more accurately reflects evidence of the current demographic conditions" (pp. 14-15; cf. *Kirkpatrick v. Preisler* 1969).

ESTIMATING SPANISH-ORIGIN CITIZEN VOTING-AGE POPULATION

With respect to the issue of misreporting of citizenship, from a social science perspective it is in the same category as census undercount, namely, a can of worms. The trial court rejected the claim that the official census counts of citizenship should be replaced with the estimates of citizenship offered by Clark. Clark and Morrison (1991) asserted that at least one California court accepted the correction for estimated citizen misreporting that Clark offered in his testimony in the Los Angeles Supervisors case and cited *Skorepa v. City of Chula Vista*, a case in which Morrison testified on behalf of the defendant jurisdiction. While Morrison's citizenship numbers were cited by the *Skorepa* court, there was no reference in the decision to the citizen misreporting methodology used by Morrison, and apparently no census figures on citizenship were offered by the plaintiffs' expert, Bruce Cain. Thus

Skorepa is of minimal or no precedential value with respect to the acceptability of a citizenship correction for misreporting. Indeed, with respect to previous censuses, federal courts have consistently rejected claims that census figures require statistical adjustment, although the need for adjustment of 1990 census figures remains, as of this writing (January 1991), an issue of legal dispute.

Clark and Morrison said that "demographers with the Census Bureau have devised adjustment procedures to correct for citizen misreporting at the national level" (p. 720) that have been applied to calculate the 1980 number and proportion of Hispanic citizens in certain counties, including Los Angeles. However, any claim that the Passel et al. corrections are recommended by the Bureau of the Census is false. One of the plaintiffs' expert witnesses who testified against the appropriateness of using the Warren and Passel estimates to replace official census figures is Dr. Robinson, who now holds the position at the U.S. Bureau of the Census previously occupied by Passel. Robinson testified that in a choice between the census numbers and the Passel modifications he would "choose the census data" (February 15, 1990, p. 151). Indeed, his view was quite clear that no correction for misreporting was sufficiently well justified that it ought to be applied to Los Angeles County data.

Another problem with Clark and Morrison's recommendation to adjust the citizen estimates to reflect estimated differential citizen misreporting is that that choice is a decision to adjust the estimates of potential Hispanic voting strength *downward*. If one is going to decide to adjust official census figures, then there are other adjustments that might be made that would adjust the Hispanic population and voting potential upward. For example, if one takes into account the quite well-documented fact that Hispanics are less likely to be counted by the census than are non-Hispanics and the evidence that this undercount is greatest in the areas of highest Hispanic concentration, one would estimate the Hispanic population as greater than what is shown in the census. If so, even though the overall population needed to create an equipopulous district would increase when we took undercount into effect, because the undercount occurs disproportionately in the areas where Hispanic population is concentrated, after population data is corrected for undercount, it would be possible to draw an equipopulous district with a higher percentage of *both* Hispanic persons and Hispanic voting-age eligibles than before. The reason for this is that the previously drawn, heavily Hispanic district would now be overpopulated and it would be possible to eliminate from it some areas where the Hispanic citizen proportions were lower than in the district overall.

Clark and Morrison are in favor of seeking to “correct” for citizen misreporting but not in favor of correcting for the well-known minority undercount. Contrary to the claim in Clark and Morrison (1991, 721), the basis of adjusting for undercount is at least as plausible as adjusting for misreporting. In both cases, we need to apply national figures to local data. Clark and Morrison applied national estimates of misreporting to Los Angeles, despite the fact that there is evidence that citizen overreporting is lower in Los Angeles than nationally, but they rejected undercount corrections. As a justification for not correcting for undercount, they pointed out in Note 11 the official position of the Census toward such statistical adjustments of 1980 data: “The Census Bureau has concluded that it was not feasible to adjust the counts from the 1980 Census on the basis of the available data in such a way as to ensure that the adjusted census counts would more accurately reflect the true distribution of the 1980 population than the official counts” (p. 724 n. 11, quoting Fay, Passel, and Robinson 1988, 7). They ignored the fact that the Census Bureau’s position with respect to replacing citizen counts with a statistical correction based on estimated citizenship misreporting is exactly the same: It should not be done. Moreover, they neglected to point out that the Passel of Warren and Passel (1987), whose estimates they wished to use to “improve” on official census figures, is the same Passel who in Fay, Passel, and Robinson (1988) said that statistical adjustments should not be used to replace official census figures.

SPANISH-ORIGIN SHARE OF REGISTERED VOTERS

Clark and Morrison (1991) concluded their article with the claim that if the 1990 remedy plan adopted by the *Garza* court had been in place since 1981 it would have had “dilutive effects on Hispanic voting strength during most of the 1980s” (p. 722). One reason for this alleged dilution, they asserted, is the fact that for much of the decade, the district would have “contained a [voting] majority of *non-Hispanics* potentially able to control the outcome of elections there” (p. 722). Yet Clark and Morrison also suggested that it is dilutive to “pack” Hispanics into a “single district.” But these two positions are contradictory. The 1981 plan was a plan that fragmented Hispanic voting strength; the remedy plan ended that fragmentation. The most Hispanic district in the plan held to be unconstitutional began the decade with a 21% share of Hispanic registrants in 1982 and was still only 25% Hispanic in 1988! In contrast, the remedy district had a roughly 40% Hispanic registration share even as early as 1982 and was majority Hispanic in registration by the end of the decade. Moreover, both the trial court and

the Ninth Circuit concluded that the fragmentation of the Hispanic population concentration in the 1981 plan was an *intentional* means of diluting Hispanic voting strength.

As for the reliability of estimates of Spanish-origin registration, contrary to what Clark and Morrison suggested (p. 724 n. 7), the county ratio of Spanish surname to Spanish origin to estimate the Hispanic registration at lower levels of census geography was used only as a preliminary estimate at the very early phase of the litigation well before the trial began. Instead, O'Hare obtained a special run from the census that matched, at the track level, the Bureau of the Census's Spanish-surname list against the names of census respondents and whether they identified themselves as of Spanish origin. This permitted the author to use the census-tract-specific Type I and Type II Spanish-surname error rates to develop estimates of Spanish-origin registrants for each of the proposed districts. In general, these estimates were very similar to those derived simply by using Spanish surname, but in heavily Hispanic areas, Spanish-surname counts slightly underestimate the proportion of persons of Spanish origin. In my view, O'Hare's work is the most sophisticated analysis of the accuracy of the surname matchup techniques at the local level that has yet been done and is likely to be used in future litigation to show the general reliability of Spanish-surname data.

METHODOLOGICAL CRITIQUES OF ECOLOGICAL REGRESSION

Freedman et al. (1991) presented four main arguments as to why estimates of bloc voting patterns derived via ecological regression or homogeneous precinct analysis are misleading. First, according to Freedman et al. (p. 678), ecological regression assumes that, except for random variation, within each ethnic group the probability of turning out and voting for a candidate is the same in all precincts. They claimed that this assumption is violated in Los Angeles and that, because this assumption is violated, ecological regression should not have been used. Second, Freedman et al. claimed (p. 678) that the comparisons with known answers such as those obtained from exit polls data show that ecological regression leads to mistaken conclusions about whether voting in Los Angeles County is polarized along Hispanic-non-Hispanic lines. Third, they claimed (p. 678) that a model that three of its coauthors developed in the *Garza* trial as an alternative to ecological regression, the so-called neighborhood model, is "more plausible than ecological regression" in estimating group voting behavior in cases involving racial bloc

voting claims, and in the case of Los Angeles, "fits the facts better" than do results from ecological regression. Their fourth claim is that "without survey data, there may be no reliable answers to questions about ethnic voting behavior" (p. 701).

All four assertions are false.

In addition, Freedman et al. discussed the election results in the June 1990 contest involving the Hispanic candidate Sarah Flores and implied that these results validate their view that Hispanic candidates can win in a district that is overwhelmingly non-Hispanic. However, some key facts about the Flores candidacy were omitted.

ASSUMPTIONS UNDERLYING ECOLOGICAL REGRESSION

With respect to the first point, the claim that use of ecological regression is inappropriate unless there is constancy of racial/ethnic group behavior across precincts (subject only to random variation) overstates the restrictiveness of the assumptions underlying the circumstances where ecological regression might reasonably be used. The ecological regression technique is designed to provide accurate estimates only of *average* group behavior. Freedman et al. suggested a completely unrealistic standard for applied social science. In the real world, of necessity, statistical models are routinely applied in domains where their assumptions are not perfectly satisfied, since the only place where assumptions of statistical models are *perfectly* satisfied is on the pages of statistics textbooks. Lichtman (1991, this issue) provided a more detailed look at the so-called assumptions of ecological regression analysis.

Freedman et al. (1991) pointed to variation in the voting behavior of non-Hispanic areas (precincts or districts) in some elections as demonstrating that ecological regression is inappropriate. But no one would seriously argue that all non-Hispanics are *alike* (or *vote alike*), merely that it is sensible to talk about how Hispanics vote and it is sensible to talk about how non-Hispanics vote, the way we do all the time and the way in which exit poll data are often reported. It is certainly reasonable to ask if the presence of substantial numbers of Black voters affected reliability of regression results, but it is easy to show that it did not. In the countywide nonpartisan contests I analyzed, the homogeneous Black precincts showed that they were voting for the Hispanic candidate(s) at about the same low rates that non-Hispanic Whites were. All but one of the other election contests relied on by Lichtman (1991) or myself in our analyses of polarization had only minuscule Black

population. In the one election where a substantial Black presence might conceivably have affected the reliability of the Hispanic/non-Hispanic analysis, Lichtman performed a multigroup ecological regression that demonstrated that the non-Hispanic voting behavior estimated by the standard method was simply a weighted average of the behavior of Black voters and other non-Hispanics.

Freedman et al. also suggested that it is unreasonable to believe that differences between those who are Hispanic and those who are not cannot account for voting patterns because other factors such as income, education, or party registration come into play. However, in the contests reviewed by Lichtman (1991) and myself in our analysis of polarization, party identification was not at issue: in some cases because the contests were nonpartisan, in most cases because they were primaries that involved voters from only one party (in Los Angeles it is possible to identify the proportion of Spanish-surname registrants in each party). Moreover, as Justice Brennan's opinion in *Thornburg v. Gingles* makes clear, what is relevant in judging bloc voting is the differences in voting behavior between minority and nonminority voters and not the *reasons* for those differences.

THE ACCURACY OF ECOLOGICAL REGRESSION

Freedman et al. (1991) claimed that the exit poll data show the unreliability of ecological regression because, on balance, ecological regression overstates the extent to which Hispanic and non-Hispanic voters vote differently. Here, they go wrong in a number of different ways.

First, racial bloc voting analysis is a lot more like weighing two people on a bathroom scale to try to determine whether or not they are similar in weight than it is like weighing chemicals in a pharmaceutical lab to try to determine weights to the nearest milligram; that is, establishing the fact of difference is more important than establishing exact magnitude of difference. Of course, we must still establish that minority candidates regularly lose in the jurisdiction for the *level* and *pattern* of racial bloc voting to rise to legal significance.

Second, the Freedman et al. criticisms of the failings of ecological regression with respect to the exit poll data are quite misleading. Table 10 in their article failed to show the ecological regression estimates and exit poll results for non-Hispanic voters. If it did, it would show ecological regression to be quite accurate for non-Hispanic voters. Also, Table 10 is misleading in the numbers reported for one of the contests. In the Bradley-Obledo Democratic primary, the only election where it might appear that ecological

regression gets polarization wrong by claiming it to be present when it is, in fact, absent, Freedman et al. are attacking a straw man. The ecological-regression-based number reported in Table 10 for the Bradley-Obledo contest is based on Sack's own calculations, not those of Lichtman or myself. Analysis of that election in accord with the practices I have regularly followed would not have led to error in classifying that election because the inconsistency between the ecological regression estimate and the homogeneous precinct estimate of voting patterns would have raised a "red flag" and led me to conclude that polarization was not present.

When we look at the remaining nine exit polls identified in Table 10, we find that ecological regression correctly shows a majority of Hispanics voting differently from most non-Hispanics in all five instances where the exit poll data show that not to be the case and correctly shows the two groups voting differently in the remaining four elections in which the majority of Hispanics voted oppositely from the majority of non-Hispanics; that is, ecological regression gets it right nine of nine times, both when voting is polarized and when it is not. Even in situations where there is no reason to expect race (or in this case, Hispanicity) to be a major factor, such as the referendums about carcinogenic warnings, tort law reform, the nuclear freeze, or gun control that constitute four of the five exit polls selected by Freedman et al. (pp. 687, 689), nonetheless, in point of fact, ecological regression does correctly show voting to be polarized in the contest where the exit poll gives rise to that conclusion and shows it not to be polarized in the contests where the exit polls show no polarization.

Third, Freedman et al. provided a great deal of data purporting to demonstrate the unreliability of ecological regression, but almost none of it involves elections with Hispanic candidates or referenda with issues involving the particularized interests of the minority community.

Thornburg and subsequent cases made it clear that the elections that are directly relevant to an assessment of bloc voting are those with viable minority candidates in a genuine contest against nonminority candidates or where there are issues uniquely involving the particularized interests of the minority community. The litmus test for the accuracy of ecological regression in Los Angeles County is whether it actually tells us whether voting is or is not polarized along Hispanic-non-Hispanic lines *in those votes that are potentially legally relevant to a finding of polarization in the supervisorial contests*, namely, (a) those involving a viable Hispanic candidate pitted against a non-Hispanic candidate or (b) issues of uniquely particularized concern to Hispanics. Moreover, because the supervisorial contests are non-partisan, we would pay special attention to voting patterns in contests without

a party cue, but in the two elections (the Reynoso confirmation and the English-as-an-official-language referendum) that most nearly match our conditions, countywide ecological regression results perfectly matched those from exit polls for both Hispanic and non-Hispanic voters. In the other contest involving a Hispanic candidate for which we have exit poll data, as noted earlier, analysts who looked at both homogeneous and ecological regression evidence would have correctly concluded that voting was not polarized along Hispanic-non-Hispanic lines.

I should also note that Freedman et al. neglected the way in which homogeneous precinct data can be used to complement the results of ecological regression analysis. If there is a problem with the usual methods of proving racial bloc voting, it cannot lie in situations where more than 40% of the members of either the minority or the nonminority group live in homogeneous precincts since, in such situations, ecological regression and homogeneous precinct analysis can be expected to yield near identical estimates. In Los Angeles County as a whole and in some supervisorial districts, a sufficiently high proportion of the non-Hispanic population was located in homogeneous precincts so that one could take the election results in these homogeneous precincts as a *reliable* measure of how the non-Hispanics were voting. One basis of the trial court's finding that non-Hispanic voters failed to provide significant support to Hispanic candidates was the court's reliance on "Dr. Sacks analysis . . . of five test cases of the reliability of the regression analysis for non-Hispanics" that met Sacks's own threshold for a sufficiently high proportion of non-Hispanics living in homogeneous non-Hispanic precincts to be able to treat the homogeneous precinct results as reliable indicators of non-Hispanic voting (Garza, 95). In Los Angeles, comparable levels of geographic concentration were also found for the subgroups of Black non-Hispanics and White non-Hispanics.

In five elections where there was a high concentration of non-Hispanics in "homogeneously" non-Hispanic precincts, there was an extremely close correspondence between the estimates of non-Hispanic voting for the Hispanic candidate derived by ecological regression and the actual vote for the Hispanic candidate in precincts that are more than 90% non-Hispanic. In these elections, non-Hispanic support for Hispanic candidates ranged from 2% to 23%, averaging 12%. But, if we can use homogeneous precincts to pin down the voting behavior of one group, since we know how many votes the minority candidate actually got and we can estimate minority and nonminority turnout, once we know the behavior of one group, we can find the behavior of the other group by assigning to it the votes for which we have not already accounted.

THE FLAWS IN THE SO-CALLED NEIGHBORHOOD MODEL

Freedman et al. offered as their preferred alternative to ecological regression a model that posits that *all* voters in a precinct vote in the same way as does the precinct overall. There are several problems with this model, any one of which would be fatal.

First of all, it is empirically invalid when applied to the type of elections that were at issue in the Los Angeles County case, namely, nonpartisan elections involving Hispanic and non-Hispanic candidates. The idea that Hispanics and non-Hispanics in a given neighborhood would vote identically in such a case is politically naive, as well as a classic example of the ecological fallacy. Indeed, what could be a more pernicious example of an invalid ecological inference than believing that what was true of an ecological aggregate such as a precinct must be true of *everyone* within it?

Second, the neighborhood model is a prisoner of the distribution of minority population. In countywide elections in Los Angeles, given the spatial distribution of Hispanic voters, it is *mathematically impossible* for the neighborhood model to show polarization greater than about 60-40. Indeed, in Los Angeles County as a whole, if 100% of Hispanics are voting one way and 100% of non-Hispanics are voting the other way, the neighborhood model will estimate that the split is 41-8 rather than 100-0; that is, even in this extreme case, it will not find voting to be polarized. *Thus for any countywide election, the neighborhood model is useless as a diagnostic tool because it is essentially guaranteed to find no polarization.* The only time it is mathematically possible for the neighborhood model to find polarization in a countywide race is when there is only bare polarization. Freedman et al. dismissed this point as if it were simply a matter of competing modeling assumptions; that is, if you assume ecological regression to be right, then the neighborhood model will be shown to be wrong. It is a much more conclusive point.

There are 10 countywide contests or referendum votes listed in Table 10. *If Freedman et al. had provided the data on non-Hispanic voting in these contests,* it would be obvious that in all but one of these contests the neighborhood model finds voting not to be polarized; yet in four of these contest the exit poll shows voting to be polarized. The one contest where the neighborhood model found polarization is the one *least* polarized according to the exit poll data.

Third, while Freedman et al. asserted that the neighborhood model fits the Los Angeles data "better than does ecological regression," to reach that conclusion not only do they have to neglect the clear evidence that it is unable

to detect severe polarization in countywide contests and it understates polarization in general, but they have to treat referenda on tort law reform, carcinogenic warnings, and so on as being as informative about bloc voting as elections contests involving viable Hispanic candidates or issues of particularized concerns to Hispanics. But in the most relevant elections about which we have exit poll data, the Reynoso contest and the referendum on English as an official language, the neighborhood model failed to detect polarization even though voting was in fact polarized.

THE FALLACY OF RELYING ON SURVEY DATA

Freedman et al.'s notion that the only reliable evidence that can be presented in voting rights cases is that from survey data² effectively means that minorities would *never* be able to successfully litigate voting rights challenges. First, minorities do not normally have the resources to commission professional polling firms to conduct exit polls or other surveys with a large enough sample of the relevant racial and ethnic groups reliable enough to stand up in court. Even for small jurisdictions, the cost of such an exit poll can be quite high. Second, even if they could afford the surveys, since voting rights cases require a showing of a pattern of polarization, litigation would need to be delayed until enough data were accumulated. This would deny minorities a timely vindication of their rights. In contrast, with aggregate data analysis, all that is needed are official election returns and census figures and/or registration data. Third, surveys may not be that accurate in low-visibility contests where voters cannot remember the names of the candidates for whom they are voting, and survey responses may not adequately control for turnout in situations where only a small fraction of the eligible electorate participate in the election. Finally, in situations where there are highly salient and highly polarized contests, the self-report of voters may not be fully reliable. For example, as Loewen (1990, 504-5) pointed out, in both the Wilder-Coleman contest for the Virginia governorship and the Dinkins-Giuliani contest for New York City's mayor, surveys overestimate White support for Black candidates by over 10%, presumably in large part because White Democratic voters did not wish to be seen as racist. The same was true in the Harvey Gantt-Jesse Helms senatorial contest in North Carolina in 1990.

THE SARAH FLORES CONTEST

Near the end of their article, Freedman et al. made the following statement: "Sarah Flores—a Hispanic woman—won a contest for the County Board of

Supervisors by a plurality vote" (p. 702). Just prior to this statement, they provided a quote from the District Court opinion in *Garza*, where the court stated that "an Hispanic candidate is unable to be elected to the Board under the current configuration of supervisorial districts [p. 6142]."

The juxtaposition of the quote from Judge Kenyon's trial decision with the sentence about the Flores "victory" in District 1 would appear to be intended to leave the reader with the view that the trial judge was simply not very savvy about even the most basic issues in the *Garza* trial, such as whether a Hispanic candidate could get elected in the present districts. However, Freedman et al. (a) gave the reader the mistaken impression that Sarah Flores was elected supervisor, (b) did not cite Judge Kenyon's other and more carefully worded conclusions about Hispanic potential to elect candidates of choice, and (c) omitted key background data behind the Sarah Flores candidacy.

First, contrary to the impression that might be left by the wording in Freedman et al., *Mrs. Flores was not elected county supervisor*. What she actually "won" was the right to enter a runoff election. In the primary, with 10 candidates, she came in first, with a majority of the Hispanic vote and a plurality (about one third) of the non-Hispanic vote.

Second, the given quote is from the summary statements at the beginning of the *Garza* opinion. What Judge Kenyon later said about the Hispanic electorate was that it would "not normally have an opportunity to elect a candidate of their choice in even the most Hispanic [supervisorial] districts" (p. 98).

Third, the Flores "victory" is far from normal for a number of reasons. Because of peculiarities in California election law and the timing of the withdrawal from the race of the incumbent in District 1, after it was known that the incumbent was not seeking reelection there was only a *5-day period during which people were eligible to file for office*. Given that incumbent's million-dollar war chest and the way in which Hispanic voting strength had been unconstitutionally and deliberately fragmented, no candidate with a serious chance of victory had filed for the election before it was known that it would be an *open seat contest*. Moreover, no candidate who had already filed for another office was legally permitted to change his or her mind and file for the Supervisor 1 open seat. Supervisorial office is a plum. Most state legislators and even some members of the U.S. House of Representatives in the Los Angeles area would rather be a supervisor than hold their state or federal office. Effectively, all were prohibited from running for the Supervisor 1 open seat. In the November 1990 election held under the remedy plan, Mrs. Flores was part of a field of candidates that included two of the best

known Hispanic officeholders in the Los Angeles area, including a Hispanic member of the Los Angeles City Council and a Hispanic state legislator. In that field, she came in third. Had the originally scheduled runoff taken place, she would have been competing against a comparably well-financed White opponent who had the support of the incumbent supervisor. When the 1981 districting plan was held unconstitutional, that runoff election was canceled.

But even leaving aside these peculiar features, the only reason why Mrs. Flores did as well as she did initially was that two White supervisors (Antonovich and Dana) sought to moot the lawsuit by backing a Hispanic candidate who would otherwise not have a chance to be elected. These supervisors were concerned about the political changes that would take place if the *Garza* lawsuit was successful, especially the potential redrawing of their own districts.

Judge Kenyon's key finding about the unusual circumstances surrounding the Flores candidacy was his acceptance of the testimony of another candidate for the Supervisor 3 position, Judge O'Brien, about the contents of statements made to him by Supervisors Antonovich and Dana about the Flores campaign, despite their denial that they had made those statements:

The Court finds the testimony of Judge O'Brien regarding the statements of Supervisors Dana and Antonovich as to their reasons for endorsing Sarah Flores credible. According to Judge O'Brien's testimony, these two supervisors decided to endorse the candidacy of Sarah Flores in the belief that their support of an Hispanic candidate would favorably influence the outcome of this pending lawsuit. Specifically, Judge O'Brien testified that Supervisors Dana and Antonovich stated in separate conversations with him that *the judge could be influenced by political manipulation and that if the two supervisors backed a successful Hispanic candidate the judge would be persuaded to dismiss the lawsuit* (Amended Order, August 3, 1990, 14-15, emphasis added)

Sarah Flores had never previously held elective office. The incumbent supervisor (Schabarum) in District 3, for whom she was then working as assistant chief deputy, endorsed another candidate. Looking at the background of the Flores candidacy, Judge Kenyon found as follows: "Supervisors Antonovich and Dana co-sponsored a fundraising dinner at the Biltmore Hotel for Mrs. Flores. Proceeds from the function totalled \$250,000, more than 60 percent of the \$400,000 Mrs. Flores raised and spent on her primary campaign." There was also testimony that Supervisors Dana and Antonovich assisted Mrs. Flores's campaign in other ways, such as providing her access to their own (normally jealously guarded) lists of potential campaign contributors and by arranging that she have access to professional consulting advice from individuals with whom they had political ties. Judge Kenyon

also found that "Supervisor Antonovich testified that he had known Sarah Flores since high school; had encouraged hundreds of individuals to run for elective office; and had never approached Mrs. Flores to run for any office until after the trial of this case was underway" (Amended Order, August 3, 1990, 14-15, with change in ordering).

SUMMARY AND DECISIONS

The articles by Clark and Morrison and by Freedman et al. are marred by serious errors as to the relevant law in voting rights cases. These legal errors are important in that legal precedents help define what the *relevant* facts are about which expert witness testimony can be expected to aid the court.

With respect to the demographic issues raised by Clark and Morrison, they are unclear and/or inconsistent on what are the circumstances in which the replacement of official census data by statistical estimates for that *same census year* is justified, and they are unreasonably stringent as to the conditions under which carefully derived postcensal estimates might, *very late in a decade*, be an improvement over "stale" census data.

With respect to voting behavior, in the choice between standard ecological regression and homogeneous precinct techniques and what Freedman et al. referred to as the "neighborhood model," the standard techniques clearly demonstrate their superiority.

On one hand, in the two most directly relevant exit polls in Los Angeles County, that involving the Reynoso reconfirmation and that involving English as an official language,³ ecological regression results *perfectly* mirrored the exit poll data; and more generally, even for the 10 contests singled out in Table 10 by Freedman et al., ecological regression when properly complemented with homogeneous precinct analysis (as Lichtman or I would use it) was always in agreement with the exit poll data if we look simply at its diagnosis of polarization or lack thereof.

On the other hand, with respect to the "neighborhood" model favored by Freedman, Klein, and Sacks, not only is it implausible on its face but, because of the spatial distribution of Los Angeles County's Spanish-origin voters, in any countywide election or any countywide referendum, it is a matter of mathematical certainty that use of that model will guarantee a finding that voting is not polarized or only barely polarized, regardless of what Hispanic and non-Hispanic voting patterns are in that contest. A model that always gives the same answer for countywide elections regardless of the facts is

simply not useful as a diagnostic tool. More generally, as Lichtman's (1991) article demonstrated, no matter what the distribution of Hispanic voters, the neighborhood model will always find less polarization than is present unless there is no polarization whatsoever. The neighborhood model is wrong 3 times out of 10 for the data in Table 2 in Freedman et al. because it was *always* wrong in misdiagnosing polarization when voting was severely polarized.

While in theory there exists a possibility that ecological regression could overestimate the degree of polarization, my view quite simply is that, in most instances, statistical issues raised to challenge the accuracy of bloc voting estimates are esoteric quibbles that lack any practical importance and that serve mostly to prolong trials and to increase the incomes of expert witnesses for both sides. In the *Garza* case, ecological regression was subject to its severest and most extensive attack. It came through with flying colors. When used with care and with attention to the various double checks described in the published literature, ecological regression, complemented by homogeneous precinct analysis, is a reliable tool for measuring bloc voting. This is a conclusion that numerous courts have come to, including the trial court in the *Garza* case. It is the correct conclusion. Of course, a *mechanical application* of ecological regression methodology *without an understanding of its basic logic* and *without attention to any accuracy checks* (of the sort described in sources such as Grofman, Migalski, and Noviello 1985; Grofman and Migalski 1988; Loewen and Grofman 1989) could lead to error *in some very special circumstances*. Even in such situations, if there actually are problems with drawing reliable inferences from the standard methodology in a particular election, they will be revealed by failure to achieve satisfactory correlations or statistical significance or by failure of one or more of the other double checks outlined in the preceding references (see quote from trial court opinion cited in Freedman et al. 1991).

More generally, interpreting election returns is aided by a familiarity with aspects of practical politics, where the expertise of social scientists is apt to be more useful than the methodological expertise of statisticians.

NOTES

1. Freedman et al. are less clear on this point, but their discussion on p. 676, where they asked whether Hispanics can constitute a citizen voting-age majority in a district that contains 20% of the citizen voting-age population in the county, suggests that they concurred with the views of Morrison and Clark on how the "one person, one vote" rule is to be interpreted.

2. Freedman et al. believed that the only reason why only survey data can be used is that ecological regression, homogeneous precinct analysis, *and* their own neighborhood model are all unreliable. For example, under cross-examination, Freedman answered as follows:

Q: *And do you not believe that the neighborhood model is a reliable way to estimate the voting behavior in Los Angeles County; isn't that right?*

A: *Right.* Its only advantage is comparative. (March 19, 1990, 115, emphasis added)

Asked about the ability of the neighborhood model to reproduce an 80/20 split countywide — 80% of the Hispanics voting for the Hispanic candidate(s) and 20% of the non-Hispanics voting for the Hispanic candidate(s) — Klein, replied, “It wouldn’t be able to detect the 80/20 split you’re describing” (Klein cross-examination, March 8, 1990, 20). Asked whether it could detect a 70/30 split in a countywide election, Klein replied, “I think it would be tough for the neighborhood model to catch something like that” (p. 20).

3. While these two elections are the most relevant of those for which we have exit poll data, I, like Lichtman, would emphasize that they are not elections pitting a viable Hispanic candidate against one or more non-Hispanic candidates in a setting where party is not a voting cue. It is the latter situation in which I would expect voting to be most heavily polarized along Hispanic versus non-Hispanic lines. The Reynoso contest is a reconfirmation vote. Freedman, Klein, and Sacks tended to treat all elections as essentially equally potentially informative about probable polarization in the matter at issue.

REFERENCES

- Burns v. Richardson, 348 U.S. 73 (1966).
- Clark, William A. V., and Peter A. Morrison. 1991. Demographic paradoxes in the Los Angeles voting rights case. *Evaluation Review* 15:712-26.
- Fay, Robert E., Jeffrey S. Passel, and J. Gregory Robinson. *Coverage of population in the 1980 Census*. Report no. PHC 80-E4. Washington, DC: U.S. Department of Commerce, Bureau of the Census.
- Freedman, David A., Stephen P. Klein, Jerome Sacks, Charles A. Smyth, and Charles G. Everett. 1991. Ecological regression and voting rights. *Evaluation Review* 15:673-711.
- Gingles v. Edmisten, 590 F.Supp. 345 (1984).
- Grofman, Bernard, and Michael Migalski. 1988. Estimating the extent of racially polarized voting in multicandidate elections. *Sociological Methods & Research* 16:427-54.
- Grofman, Bernard, Michael Migalski, and Nicholas Noviello. 1985. The “totality of circumstances” test in Section 2 of the 1982 extension of the Voting Rights Act: A social science perspective. *Law and Policy* 7:209-23.
- Karlan, Pamela. 1989. Maps and misreadings: The role of geographic compactness in racial vote dilution litigation. *Harvard Civil Rights-Civil Liberties Law Review* 24:173-248.
- Lichtman, Alan J. 1991. Passing the test: Ecological regression analysis in the Los Angeles County case and beyond. *Evaluation Review* 15:770-99.
- Loewen, James W. 1990. Comment: Sand in the bearings: Mistaken criticism of ecological regression. *Urban Lawyer* 22:503-13.

- Loewen, James W., and Bernard Grofman. 1989. Recent developments in methods used in voting rights litigation. *Urban Lawyer* 21:589-604.
- O'Hare, William. 1991. The use of demographic data in voting right litigation. *Evaluation Review* 15:729-45.
- Thornburg v. Gingles, 478 U.S. 30, 106 S. Ct. 2952 (1986).
- Warren, R., and J. S. Passel. 1987. A count of the uncountable: Estimates of undocumented aliens counted in the 1980 United States Census. *Demography* 24:375-94.

Bernard Grofman is Professor of Political Science and Social Psychology at the University of California, Irvine. His major fields of interest are in American politics, comparative election systems, and social choice theory. He has coedited a number of books including Choosing An Electoral System (with Arend Lijphart; Praeger, 1984), Representation and Redistricting Issues (with Arend Lijphart, Howard Scarrow, and Robert McKay; Lexington, 1982); Electoral Laws and Their Political Consequences (with Arend Lijphart; Agathon, 1986), Information Pooling and Group Decision Making (with Guillermo Owen; JAI, 1986), The Federalist Papers and The New Institutionalism (with Donald Wittman; Agathon, 1989), and Controversies in Minority Voting: A 25-Year Perspective on the Voting Rights Act of 1965 (with Chandler Davidson; Brookings Institution, forthcoming), and is sole editor of Political Gerrymandering and the Courts (Agathon, 1990).