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# **The Use/Nonuse/Misuse of Applied Social Research in the Courts**

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### *Case Histories*

tion of your employees and increase their pay by x number of dollars per week and you agree to pay \$25,000, we will settle the case."

In a criminal court that's known as plea bargaining and that's exactly what they do at EEOC. I think that that is somewhat less than fair.

Earlier we were talking about fairness and what trial lawyers do in cross-examination. Dr. Rossi's account of his terrible treatment by counsel reminded me of a story. A number of years ago I represented the Massachusetts District Commission (MDC) and the question was whether or not certain prestressed concrete pipe, which was made by Lockjoint Company in New Jersey and which was specified by the MDC, was better than regular reinforced pipe. I found the one man in the world who knew more about prestressed concrete pipe than anybody else. He turned out to be an Israeli and I found him in New York, of all places.

I went to New York and spoke with him and he said, "Yes, there's no question, the prestressed concrete pipe was better than reinforced concrete pipe, and I will testify for you." I brought him up to Boston and went through two days of preparation. At the end of that preparation I said, "This is an important case, \$15 million is involved, and there are five lawyers on the other side who are going to cross-examine you. Remember, English is not your first language, so whenever you're asked a question and you want to think about the answer, just ask them to repeat the question."

We went through two days of direct examination; he was well prepared for it. The direct examination could not have been better.

Lou Weinstein, who started the cross-examination, was a very good trial lawyer in Massachusetts. He asked the first question, which was a neutral question, and the witness said, "Could you repeat that, please?" Lou repeated it, and the engineer thought about it and said, "Could you repeat that, please?"

Well, after three days of that, Lou said, "That's all I want from this witness." He turned around and said under his breath, "You dirty son-of-a-bitch." The witness yelled out, "I'm not a dirty son-of-a-bitch. You're a dirty son-of-a-bitch."

## *MATHEMATICS, SOCIAL SCIENCE, AND THE LAW*

### **BERNARD GROFMAN AND HOWARD SCARROW\***

Let me begin by stating some summary generalizations based on my reaction to the earlier presentations and on the lessons I've gleaned reviewing both Supreme Court cases on jury decision making and New York cases on representation involving weighted voting electoral systems.<sup>5</sup>

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## CASE HISTORIES

I would propose that the social scientist who wants to do research which will have an influence on court decisions should do four things.

First, publish in law journals.

Second, explain, preferably in words of one syllable, exactly what the research consists of and how it is relevant to potential legal decisions that courts might be expected to confront. As social scientists, we are accustomed to presenting our research in terms of which theories are rebutted and which supported. If we are going to write for the courts, we have to explain ourselves in terms of relevance to the legal issues on which courts must decide.

Third, use a self-promotion strategy; in other words, send a copy of one's published research to the judges that one expects will be concerned with it (or to their law clerks, if it's the U.S. Supreme Court) as well as to those lawyers who might make some use of it or who might cite it in their law journal articles. (Be careful, however, to make it available to all parties to any legal dispute.)

Finally, and most importantly, recommend something which the judges already want to do, because it will then be used by the courts to provide a rationale for a decision which was actually reached on other grounds, but one will be able to claim that one's work was influential.

With these observations out of the way, let me turn to some actual cases on jury decision making and on equal representation. Because of time limitations I will state conclusions without being able to substantiate them fully. For details see Grofman (1974, 1976, 1980a, 1980b, 1980c) and Grofman and Scarrow (1979a, 1979b, 1980).

Let me summarize in advance my main points. First, with the important exception of the Blackmun opinion in *Ballew v. Georgia*, a 1978 case in which the U.S. Supreme Court held that five-member juries are constitutionally impermissible, the recent Supreme Court rulings on jury size and jury unanimity requirements represent the *misuse* of social science by the courts.

Second, the New York state courts' rulings on the constitutionality of weighted voting (in particular, the rather obscure New York Court of Appeals case that I'm going to concentrate on, *Iannuci v. Board of Supervisors of the County of Washington* [1967]) provide intriguing and important examples of the *use* (indeed whole-hog acceptance) of social science by the courts.

Finally, since the conference deals with use, misuse, and nonuse, let me also mention briefly an area which seems to exemplify perfectly the *nonuse* of social science by the court, and that is *Buckley v. Valeo* (1976), a recent Supreme Court case in which the Court dealt with the constitutionality of limits on campaign contributions and expenditures, and with public financing of election campaigns. In my view, had the Supreme Court been willing, social science could have played a major role in resolving the complex issues in this case by addressing certain important factual questions which the Court dismissed as irrelevant to its decision making because it claimed they had no known answers.

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## Case Histories

### The Jury Cases

As I look at the jury decision-making cases, I think of the opening lines of *A Tale of Two Cities*. For me the jury cases offer a view of the U.S. Supreme Court in which the Court makes use of the best of reasons and of the worst of reasons. The use of social science by the Court ranged from *abysmal* in the first of the jury cases, *Williams v. Florida* (1970), to remarkably *sophisticated* in the Blackmun opinion in the fourth of these cases, *Ballew v. Georgia* (1978), to *nonexistent* in the most recent of the jury cases, *Burch and Wrestle v. Louisiana* (1979).

I want to present an overview of the jury cases in terms of a variety of approaches which the Supreme Court has taken to the use of social science. I call the first of these the "Kris Kringle" approach, in honor of *Miracle on 34th Street*. In that approach the Court appears to be unwilling or unable to distinguish between speculation and social science.

In the first of the jury cases, *Williams*, the Court listed a variety of studies which purported to say something about whether or not six-member juries were likely to be discernibly different from twelve-member juries. As a number of scholars (including Shari Diamond and Michael Saks) have pointed out, these "studies" were in fact not studies at all; they were unsupported opinions. The Court's reliance on such evidence is akin to the strategy that proved that Kris Kringle was really Santa Claus in *Miracle on 34th Street*.

You may remember that in that movie the proof comes when the post office delivers to Kris Kringle dozens and dozens of stacks of mail addressed to Santa Claus. The fact that Kris Kringle has been given stacks of mail by people who happen to think that Kris Kringle is Santa Claus does not really prove that Kris Kringle is Santa Claus. Similarly, the fact that the Supreme Court was able to find some number of lawyers and judges who happen to think that six-member and twelve-member juries would not arrive at different verdicts does not really prove that there will be no discernible verdict differences between six-member and twelve-member juries.

A second approach of the Court is the "Lice-in-the-New-Hebrides" approach, which is a term I will use to refer to the Court's inability (an inability often shared by social scientists) to distinguish between methodologically sound and methodologically flawed research. We may describe the Lice-in-the-New-Hebrides approach as follows. A scientist interested in how one can improve the health of the New Hebrides citizens goes to the New Hebrides, examines healthy and unhealthy people, and discovers that the healthy people have lice and the unhealthy people do not. The scientist concludes, in good Millsian fashion, that if one wishes to improve the health of the citizens of the New Hebrides, one should import lice.

In the third of the jury cases, *Colgrove v. Battin* (1973), the Court claims that four empirical studies provide convincing empirical evidence that there is "no discernible difference" in verdicts between six-member and twelve-

## CASE HISTORIES

member juries. These four studies have been devastatingly critiqued and appropriately demolished in work by Zeisel and Diamond (1974) and Saks (1977). It is fair to say that, after one has listed all of the methodological flaws of these studies, even though confusion of cause and effect is not among them, it would still be a presumptuous social scientist indeed who would claim that these studies proved either singly or in toto anything at all about the existence or nonexistence of differences in verdict outcomes between six-member and twelve-member juries.

A third difficulty with Supreme Court uses of social science in the jury case is that the Court is generally prepared to exaggerate or distort available social science evidence and theory in order to buttress the intuitions of justices. I think of this as the "It-Always-Snows-on-Christmas" approach. That is to say, when courts and judges look at social science, they eliminate the hedges, the buts, the ifs, the ands, the maybes, and the *ceteris paribus* clauses which make social science social science.

In *Ballew v. Georgia* (1978), Justice Blackmun cites a study by Nagel and Neef (1975) which purports, at least as summarized by Justice Blackmun, to show that it is indeed permissible to draw the line at six jury members but not at five. However (as Stuart Nagel pointed out in his earlier presentation), it was improper by social science standards (and I think by legal standards) to use the Nagel and Neef piece to support the claim that the optimum jury size is between six and eight members, because that conclusion rested on a series of assumptions, at least some of which are questionable and at least one of which is in fact impossible to verify directly.<sup>6</sup> Furthermore, Nagel and Neef (1975) themselves were quite careful to point out the "if-then" nature of their results.

Fourth, the Court has shown itself willing to ignore evidence unfavorable to its views and, in fact, to "Bury the Evidence in the Footnotes," a common strategy among lawyers who are drawing up contracts. This occurred in *Williams* (1970), in which several important studies were cited but their findings were not discussed, because their conclusions ran counter to the assertions made by the Court majority.

Fifth, the Court has followed a strategy which I would call "Sticking to the Yellow Brick Road," by which I mean that if an article is not to be found in the *Index to Legal Periodicals*, it is unlikely to be found in Court opinions. With rare exceptions lawyers simply are unwilling (or perhaps uninterested or unable) to search out potentially relevant nonlegal references that are not referenced in the legal literature. Hence, as mentioned earlier, if one wants one's research to influence courts, one really has to publish it in ways that will make it accessible; in other words, it should appear in the periodicals that lawyers read.<sup>7</sup>

Sixth, even when it has relied heavily on social science evidence, the Court has been unwilling, in my view, to acknowledge the overwhelming implications of that evidence, when to do so would entail a politically unpleasant task for the justices, namely, reversing previous decisions. I think of this as the "Wrapped-in-the-Bosom-of-Abraham" mentality of judges, although this is

### Case Histories

perhaps an unfair way of characterizing *stare decisis*. The Court has thus been unwilling to take social science where it leads, especially if it leads to the reversal of decisions made by judges still sitting on the bench.

Hans Zeisel has said that *Ballew* (1978) represents the first case in which social science has moved out of the footnotes of U.S. Supreme Court decisions into the body of the text. Those who are familiar with the case know that Blackmun's opinion reads like a social science article, citing both empirical and theoretical studies. Moreover, not only is Blackmun's opinion in *Ballew* social science, it is, by and large, good social science. Nevertheless, in *Ballew* (in which the Court rejected five-member juries as unconstitutional) social science evidence in my view should have led the Court to a reversal of *Williams V. Florida* (1970) (in which the Court accepted the constitutionality of six-member juries). The empirical studies that the Court (or at least Justice Blackmun) relied upon in *Ballew* to declare five-member juries unconstitutional were in fact studies which compared six-member juries and twelve-member juries. Justice Blackmun accepted the fact that the studies cited in *Williams* and *Colgrove*, which previously had been used to support six-member juries, were methodologically flawed, and he cited favorably a variety of studies which condemned six-member juries relative to twelve-member juries. For Justice Blackmun to then come out in opposition to five-member juries and to reaffirm his support for six-member juries seems, to put it mildly, to have been disingenuous.

Seventh, reaction to Blackmun's opinion in *Ballew* reveals that at least some justices of the Supreme Court think of social science as "That Old Black Magic" and are resolved that "That Old Black Magic" will never get them under its spell. In *Ballew* Justice Powell (joined by Justices Burger and Rehnquist) refers to social science research as "numerology" and condemns Blackmun for his reliance on it.<sup>8</sup>

#### Equal Voting Representation and Weighted Voting at the County Level in New York

Recent Supreme Court cases have stressed the requirement that apportionment and electoral systems at all levels of government approach the ideal of "one person, one vote." In the 1960s and thereafter unequally populated, single-member legislative districts were more or less eliminated due to court and legislative action. Also eliminated have been so-called unit voting systems, which provided for one representative from each political subunit, regardless of the population of that unit.

In order to preserve traditional political boundaries and the traditional political power of Republican machines in the smaller counties, many county governments in New York responded to these one-person, one-vote decisions either by shifting over to a combination of single- and multiple-member districting in which smaller townships became single-member districts and larger townships were divided into multimember districts, or (in twenty-three

## CASE HISTORIES

counties) by following the example of Nassau County, which since 1917 had made use of weighted voting. (In a weighted voting system, rather than having, say, one representative for every 10,000 people, a representative has, say, one vote for every 10,000 people represented.) Thus, in New York county legislatures, one township with 20,000 people may have a representative with 10 votes, while a township with 200,000 people has a representative with 100 votes.

In 1967 the New York courts were confronted with the issue of whether or not weighted voting could pass constitutional muster as satisfying one-person, one-vote standards. In *Iannuci v. Board of Supervisors of the County of Washington* (1967), a state court held that an argument put forward by a lawyer, John Banzhaf III (Banzhaf 1965), was to set the standard which would govern whether or not systems of weighted voting apportionment would be held constitutional.

As an example of how Banzhaf's standard works, imagine that we have three districts with 200, 200, and 100 voters. If we allocated 2 votes to the districts with 200 voters and 1 vote to the district with 100 voters, we would have a weighted voting system with 3 representatives having 2 votes, 2 votes, and 1 vote, respectively. The relative proportions of these weights might seem to satisfy the one-person, one-vote guidelines; that is to say, a legislator representing 200 of the 500 voters, or two-fifths of the total voters, would have 2 votes out of 5, seemingly two-fifths of the total power.

Banzhaf argued that rather than look at the proportion of weights, we should consider the likelihood that a legislator would cast a *decisive* vote. In this example if 3 votes are needed for passage, the representatives with 2 votes are not more powerful than the representative with 1 vote, because *any* 2 legislators, by combining their votes, are able to insure passage. Moreover, if either changes his mind, the position is reversed. Thus, in Banzhaf terms, all 3 legislators have equal power because each has equal ability to affect the outcome.

Banzhaf (1965) argued that the appropriate criterion for one-person, one-vote standards in legislatures using weighted voting is whether the power held by a legislator is proportionate to the population that that legislator represents. In the 2-2-1 example we would violate the Banzhaf criterion, because legislators representing two-fifths of the population would have only one-third of the power and legislators representing one-fifth of the population would also have one-third of the power.

Through *Iannuci* it is now law in New York that all twenty-four counties which make use of weighted votes have their proposed weighted voting system subjected to the test of the Banzhaf doctrine. In order to calculate Banzhaf indices, we must look at the number of possible combinations of votes. For larger legislatures it is necessary to do a computer calculation to determine whether or not a proposed apportionment scheme in fact satisfies the Banzhaf criterion.

*Iannuci* is a remarkable example of the whole-hog acceptance of social science notions in the law. But as we look at the response by New York courts



### Case Histories

to applications of this mathematical notion of power as a measure of fair representation, we discover some interesting facts suggesting an inability to apply well in practice what has been wholeheartedly adopted in theory.

First, we discover that what the New York courts have adopted with relish the U.S. Supreme Court has looked upon with dismay. The U.S. Supreme Court, when it was confronted with an argument inspired by Banzhaf (1966) against the constitutionality of a mixed, single- and multiple-member district system, rejected the argument. According to the majority opinion in *Whitcomb v. Chavis* (1970), "while we have no fault to find with the defendant's mathematics, we find his reasoning irrelevant to the constitutional issues before the court, . . . because it neglects 'political realities'." In *Whitcomb* the Court rejected the argument of Banzhaf (1966). In *Iannuci* (1967) the New York Court of Appeals embraced the closely related argument of Banzhaf (1965); but the New York courts never reconsidered the *Iannuci* decision in the light of *Whitcomb*, despite the fact that a dictum in *Whitcomb* suggested the Supreme Court has no more appreciation for Banzhaf (1965), the Banzhaf analysis relied on in *Iannuci*, than the Court did for Banzhaf (1966), the Banzhaf argument rejected by the Court in *Whitcomb*.

Second and relatedly, no New York court has ever seen the applicability of the Banzhaf measure envisaged in *Iannuci* to mixed single- and multiple-member districting systems. Yet in a system where representatives are elected from the same constituency by the same electorate and, hence, given the realities of party politics, those representatives tend to vote alike, a system involving mixed single- and multiple-member districts is mathematically identical to a system of weighted voting. Thus, the same standards which are applicable to weighted voting apportionments ought to be applicable to mixed single- and multi-member districts, at least if one believes, as I do, that bloc voting of district representatives is the political reality. The New York courts have simply failed to recognize this.

Third, the New York courts have been inconsistent in operationalizing the extent of deviation allowed from the Banzhaf criterion. Because the measurement of deviation involved a percentage standard in some cases and a percentage *point* standard in others, weighted voting schemes held permissible under prevailing guidelines by some courts would have been held impermissible by others, and vice versa. For example, if a township has 2 percent of the weight and 1 percent of the population, some courts have treated this as a 1 percentage point discrepancy, while others have treated it as a 100 percent discrepancy. Moreover, in cases where one subunit (for example, a township) has more than 50 percent of the county population, the attempts by New York courts to reconcile the Banzhaf criterion with one-person, one-vote standards have been ingenious but specious (see especially the recent Nassau cases *Franklin v. Krause* [1973] and *Franklin v. Mandeville* [1970]).

Finally, no court, whether state or federal, has ever really fully understood the reasoning underlying the mathematical arguments in Banzhaf (1965, 1966); or successfully distinguished among what, upon careful analysis, turns out to be the three *different* criteria suggested by Banzhaf in one or

## CASE HISTORIES

the other of these articles;<sup>10</sup> or realized that while these three criteria coincide for single-member district systems, for other systems (especially weighted voting systems) the three criteria may lead to different policy recommendations.<sup>11</sup>

To sum up, New York courts have adopted a Banzhaf criterion for fair apportionment without ever recognizing that Banzhaf enunciated more than one such criterion, without being consistent in judging deviations from that standard, and without ever really understanding what Banzhaf (1965, 1966) meant. Thus, the New York weighted voting case represents an extensive application of social science ideas, but in a badly flawed way.

## NOTES

1. My colleagues on this project are Charles Pulaski of the University of Iowa College of Law; George Woodworth, University of Iowa, Department of Statistics; and Frederick Kyle, Seattle, Washington.

2. The data used in the pilot study were collected by the editors of the *Stanford Law Review* and provided to us through their courtesy. An earlier analysis of the same data can be found in "A Study of the California Penalty Jury in First Degree Murder Cases" (1969).

3. For further details on the deductive model briefly described in this paper, see S. Nagel and M. Neef, *Legal Policy Analysis: Finding an Optimum Level or Mix* (1977, pp. 75-162). For a shorter version, see Nagel and Neef, "Deductive Modeling to Determine an Optimum Jury Size and Fraction Required to Convict" (1975, pp. 933-78).

4. For further discussion of what variables, besides value reinforcement, lead to research utilization by the courts and other policymakers, see Weiss (1977) and Rosen (1972).

5. See Grofman (1980a), Grofman and Scarrow (1979a), and Grofman (1980b).

6. For example, Nagel and Neef (1975) give alternative assumptions as to the percentage of individuals brought to trial who are "truly" guilty. Exactly which assumption is chosen has a tremendous impact on the results.

7. This was particularly unfortunate in *Ballew*, since Justice Blackmun remained in ignorance of the best work done on modeling jury decision making, that of Alan Gelfand and Herbert Solomon. Their articles appeared in the *Journal of the American Statistical Association* in 1973, 1974, and 1975.

8. I should, however, point out that the studies which Blackmun made use of in *Ballew* were not published in refereed social science journals. So Powell's attack on social science "numerology" is not quite as much of a slam against social science as one might think. In fact, it turns out really to be much more of an attack against the reliability of articles published in law journals!

9. Of course, as Justice Harlan points out in a brilliant and quite scathing opinion in *Whitcomb*, if one is to chastise anyone for neglecting political realities, the chastisement is at least equally relevant to the Court itself in its decisions in *Wesberry v. Sanders* and later cases in which strict population equality standards were held as the only legitimate test of fair equal representation. As Harlan says, to equate strict district

### Case Histories

population equality with equal representation is to "neglect political reality," and the question is, in Harlan's felicitous phrase, whether one prefers "higher mathematics" (Banzhaf) to "sixth grade arithmetic" (the Court).

It's also interesting to note that the U.S. Supreme Court disliked the Banzhaf measure because of its political unreality, yet it is this characteristic which appealed to the New York court in *Iannuci*. The New York court praised the Banzhaf measure because it is abstract and divorced of political realities and, therefore, results in calculations which do not need to be revised with each new set of election returns.

10. The task had, however, been complicated by Banzhaf's own failure to label these three criteria. See Grofman and Scarrow (1980).

11. In practice two of the three criteria usually give rise to virtually identical results even for weighted voting systems. See Grofman and Scarrow (1980) for further details.

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