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Stuart S. Nagel
University of Illinois College of Law

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MULTIPLE CORRELATION OF JUDICIAL BACKGROUNDS AND DECISIONS

Stuart S. Nagel*

I. THE BASIC RESEARCH DESIGN

In the early 1960's this writer published a series of articles describing the relation between the backgrounds of judges and judicial decisional propensities. The basic research design used for this project was divided into three components. The first step was to establish a number of hypotheses, for example: if judges possess a particular background characteristic, then it may be possible to predict that they also generally possess a specific decisional propensity. Next, the hypotheses were tested through compilation and analysis of data supplied from carefully selected sources. The data sources for this analysis were the judicial decisions and background characteristics of the judges on every state supreme court that was bi-group with respect to the background characteristic under investigation; compilations were based on all the nonunanimous decisions reached by these courts during their 1955 term. After statistical analysis of the data, conclusions about the presence and strength of the proposed relationship could be drawn.

One relation investigated during this period was that hypothesized to exist between political party affiliation and a propensity to favor the


3. See id. 15-20.

4. The background characteristics used were defined so that a judge would belong to one of two categories. For a discussion of the problems encountered in positioning the judges, see Nagel, Testing Relations Between Judicial Characteristics and Judicial Decision-Making, 15 W. POL. Q. 425, 428-30 (1962). A court was bi-group with respect to a background characteristic (such as political party) if it had at least one member included in each category (that is, at least one Democrat and one Republican). To understand why it was necessary to restrict the sample to bi-group courts, see note 17 and accompanying text infra.

5. Nagel, Testing Relations Between Judicial Characteristics and Judicial Decision-Making, 15 W. POL. Q. 425 (1962), gives more detailed information about the methods used to gather and analyze the data for this early research. The year 1955 was the only year for which the valuable Directory of American Judges was published. The time period used is referred to in this article as a possible explanatory variable where it may be relevant, although the general findings do not appear to be time-bound.

6. S. Nagel, supra note 2. at 20-23.
defense in criminal cases. The specific hypothesis used was: "Democratic judges have a greater tendency to decide for the defense in criminal cases than do Republican judges." To test the hypothesis, it was necessary to compare: (1) the percentage of Democratic judges (the +X position) who decided for the defense in criminal cases more often than their supreme court did (the +Y position) with (2) the percentage of Republican judges (the -X position) who decided for the defense more often than their supreme court did (the +Y position).

The conclusion drawn from these comparisons was that, compared to other background characteristics, political party affiliation is a relatively accurate predictor of decisional propensities among state supreme court judges hearing criminal cases.

Some reviewers of this early research indicated that determining the relations between two or more background characteristics and two or more decisional propensities simultaneously could lead to additional insights about the relation between a judge's background and the judicial rulings he made. The purpose of this article is to provide such a multiple correlation analysis of judges' backgrounds and decisions.


8. Because it is used here to predict the presence of a decisional propensity, political party affiliation is called an independent variable. The letter X is usually used to represent such a variable. Since the propensity to favor the defense is the behavior to be predicted, it is regarded as the dependent variable. The letter Y usually denotes the dependent variable. In this case each usable member of the sample set can assume only one of two possible positions with respect to each variable: either a judge is a Democrat or he is a Republican; either he finds for the defense in criminal cases more often than his supreme court or he does not. Arbitrarily, one position with respect to the independent variable X will be considered positive (denoted +X) and the other position negative (denoted -X). In the same way, one position with respect to the dependent variable is considered positive and the other negative.

The results of the data collection can be summarized in a four-cell table that can be used later to compute a statistical measure of the strength of the hypothesized relationship. See note 14 infra.


10. The IBM card data and coding key from which all the calculations in this article are made are available on request from this writer or from the Inter-University Consortium for Political Research at Ann Arbor. Tables showing the names of the judges, their backgrounds, their decisional propensities and the citations to the cases used are available in Nagel, Judicial Characteristics and Judicial Decision-Making (un-
A. Some Problems in the Original Research Design

The original research design is unsuitable without modification for multiple correlation analysis because a judge's decisional propensity was measured by comparing his behavior with that of his court. This was necessary to guarantee that comparison would be made only among judges hearing the same cases at the same time. Using the original design to compare the decisional propensities of Catholic and Protestant judges who belong to the same political party (i.e., holding party constant) would require finding at least one state supreme court whose members included Catholic Democrats, Catholic Republicans, Protestant Democrats and Protestant Republicans. One would then compare (1) the percentage of Catholic Democratic judges whose decisions for the defense in criminal cases exceeded the average of their state supreme court with (2) the percentage of Protestant Democratic judges who decided for the defense more often than did their court. One would repeat this procedure for Catholic Republican judges and Protestant Republican judges.

To evaluate the combined effect of religion and party affiliation would require a similar comparison of Catholic Democrats, Catholic Republicans, Protestant Democrats and Protestant Republicans. The probability of finding a state supreme court with at least one member

published dissertation, Northwestern University Microfilms Order No. 62-865, 1961). These materials can be used for checking the calculations or for secondary analysis.

11. Failure to control for these important case determinants when comparing judges can easily lead to spurious results. For example, Glendon Schubert compares Northern trial judges with Southern trial judges in union-management cases later heard by the United States Supreme Court, and he finds the Southern trial judges decided in favor of the union about the same percentage of times as did the Northern judges. G. SCHUBERT, JUDICIAL BEHAVIOR: A READER IN THEORY AND RESEARCH 458 (1964). Southern union-management cases, however, may be much easier to decide in favor of the union, given the possibly more clear-cut violations of the National Labor Relations Act by Southern employers. See R. Downing, The Federal Courts and Labor Relations Policy, 1936-1954: A Study of Judicial Decision-Making (unpublished dissertation in University of Illinois at Urbana-Champaign Library, 1956).

The meaning of findings in other studies is also weakened because the authors did not account for differences in the cases heard by different groups of judges. See, e.g., D. Bowen, The Explanation of Judicial Voting Behavior from Sociological Characteristics of Judges (unpublished dissertation in Yale University Library, 1965); Goldman, Voting Behavior on the United States Courts of Appeals, 1961-64, 60 AM. POL. SCI. REV. 374 (1966); Schmidhauser, Stare Decisis, Dissent, and the Background of the Justices of the Supreme Court of the United States, 14 TORONTO L.J. 194 (1962). Richard Schwartz, however, has clearly indicated his awareness of this comparability problem. Schwartz, Judicial Objectivity and Quantitative Analysis, in 1963 MODERN USES OF LOGIC IN LAW 141-42. See also R. WATSON & R. DOWNING, THE POLITICS OF THE BENCH AND THE BAR 311 (1969); Sacks, Book Review, 67 AM. POL. SCI. REV. 221 (1973) (reviewing GLICK, SUPREME COURTS IN STATE POLITICS (1971)).
in each of these four categories is very small. If one wishes to assess the combined effect of more than two background variables, the opportunity to make the necessary comparisons becomes even less likely.

**B. Modifications to Allow Multiple Correlation Analysis**

As an alternative research design, one can first determine the correlation between each background characteristic, X, and the judges' decisional propensities in criminal cases, Y. To do this requires one to introduce the statistical concept of the correlation coefficient, denoted $r_{xy}$. This coefficient may assume any value between $+1.00$ and $-1.00$. The closer $r_{xy}$ is to $+1.00$, the stronger the positive relationship between X and Y; the closer $r_{xy}$ is to $-1.00$, the stronger the negative re-

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12. The average number of members of a state supreme court is seven; among its seven members, a court is not likely to have at least one judge belonging to each of these four categories.

13. This kind of partitioning or fractionization approach to the problem of partial and multiple correlation was used with regulatory agency commissioners in Nagel & Lubin, Regulatory Commissioners and Party Politics, 17 ADMIN. L. REV. 39 (1964). That research, however, did not require that all usable agencies have all the categories of commissioners being compared, although the research did use being above or below the decisional average of one's agency in a liberal direction as the decisional variable.


For the general formula to compute $r$, see P. Hoel, Introduction to Mathematical Statistics 165 (3d ed. 1962). Because each variable discussed in this article assumes only one of two values, however, the computation of $r_{xy}$ can be greatly simplified. To evaluate $r_{xy}$ in the special case, the following steps suffice. **Step 1.** Construction of a four-cell illustrating the distribution of the data collected:

<table>
<thead>
<tr>
<th></th>
<th>−Y</th>
<th>+Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>+X</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>−X</td>
<td>C</td>
<td>D</td>
</tr>
</tbody>
</table>

This table indicates that (1) in A cases, the $+X$ and $−Y$ positions were taken, (2) in B cases, the $+X$ and $+Y$ positions were taken, (3) in C cases, the $−X$ and $−Y$ positions were taken, and (4) in D cases, the $−X$ and $+Y$ positions were taken.

**Step 2.** Then $r_{xy}$ can be computed using the formula:

$$r_{xy} = \frac{BC-AD}{\sqrt{(A+B)(C+D)(A+C)(B+D)}}$$


Data collected by this author can now be used to compute the correlation coefficient between political party affiliation and a tendency to favor the defense in criminal cases (the first entry in the first column of Table 1, pp. 266-67 infra).

The four-cell constructed from the data looks like this:
relationship between $X$ and $Y$. The closer $r_{xy}$ is to 0.00 in value, the weaker the relationship is between $X$ and $Y$.

The sources used in the original design can again supply the necessary data to compute each correlation coefficient. Only bi-group courts are used because religion, party or any other background

<table>
<thead>
<tr>
<th>Democratic Judges</th>
<th>Above the average of one's court on the decision score</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>A=18</td>
<td>22</td>
<td>40</td>
</tr>
<tr>
<td>(55% of 40)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Republican Judges</td>
<td>Below the average of one's court on the decision score</td>
<td></td>
</tr>
<tr>
<td>C=31</td>
<td>14</td>
<td>45</td>
</tr>
<tr>
<td>(31% of 45)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Decision score represents the proportion of times voting for the defense in criminal cases. Unanimous cases were excluded, since they have no bearing on the direction of the position of judges relative to other judges sitting on the same court.

Id. at 190.

In this example,

A=18

B=22

C=31

D=14

Substituting these numbers in the formula for $r_{xy}$, one sees that

$$r_{xy} = \frac{(22 \times 31) - (14 \times 18)}{\sqrt{(18 + 22)(31 + 14)(18 + 31)(22 + 14)}} \approx .24$$

There is a "rule-of-thumb" that can be used to estimate $r_{xy}$ in the cases considered here:

When both the [independent] predictor variable and the [dependent] outcome variable provide for only two categories . . . the correlation coefficient is approximately [see note 33 infra] equal to (1) the percentage of cases positive on the predictor variable that are also positive on the outcome variable minus (2) the percentage of cases negative on the predictor variable that are positive on the outcome variable.

Id. at 147.

15. H. BLALOCK, SOCIAL STATISTICS 377 (2d ed. 1972) [hereinafter cited as SOCIAL STATISTICS]. The reader must remember:

The interpretation of a correlation coefficient as a measure of the strength of the . . . relationship between two variables is a purely mathematical interpretation and is completely devoid of any cause or effect implications. The fact that two variables tend to increase or decrease together does not imply that one has any direct or indirect effect on the other.

P. H. OEL, INTRODUCTION TO MATHEMATICAL STATISTICS 164 (3d ed. 1962) (emphasis added). See, e.g., the example illustrating this warning, id. at 164-65.

16. SOCIAL STATISTICS 377. $r_{xy}=0$, however, does not imply that there is no relationship between the variables since $r_{xy}$ may only be measuring the linear relation and a non-linear relation may be present. See P. H. OEL, INTRODUCTION TO MATHEMATICAL STATISTICS 377-78 (3d ed. 1962).
characteristic cannot explain differences in the decisions of members of the same court if the members of the court all share or all fail to share the background characteristic under study. Only cases decided nonunanimously are used because these are the only cases in which there are differences to explain. The size of the sample from which each correlation is determined will vary because the number of judges serving in 1955 on bi-group courts depends upon the background characteristic being studied—in other words, upon the number of \(+X\) and \(-X\) judges who are members of each court that has at least one \(+X\) and at least one \(-X\) judge.

As the next step, one can place these correlation coefficients in a correlation matrix from which a multiple correlation analysis or a multiple regression analysis can be completed. Forming the matrix requires the assumption that the number of judges upon which each correlation is based (denoted \(N\)) is in some sense a representative sample of the set of judges upon which each correlation could have been based. Assuming that the sample used is representative of the population from which it was drawn is less reasonable when, as here, membership in the sample set is not randomly determined. When one interprets the results, however, he can allow for the possibility that a group of judges is not randomly representative of the whole.

17. When this writer used judges serving on one-party courts in the correlation of political party and decisions, the correlation dropped greatly although the sample sizes increased since more judges could become members of the sample. Similarly lowered correlations were observed when the writer used judges serving on courts that were homogeneous with regard to other background characteristics being correlated.

18. See notes 4 & 8 supra.

19. The correlation matrix for the 14 background characteristics is a rectangular array of 14 rows and 14 columns. The entry in column \(j\), row \(i\) is the correlation coefficient relating the \(i\)th independent variable \(X_i\) to the \(j\)th independent variable \(X_j\). See Social Statistics 386-87 (1st ed. 1960).

20. See notes 53-63 and accompanying text infra, discussing multiple correlation analysis.

21. See notes 64-66 and accompanying text infra, discussing multiple regression analysis.

22. The statistical term “sample” refers to the subset of the “population” (see note 23 infra) contributing the data on which the statistical computations are based and from which statistical inferences are drawn. P. Hoel, Introduction to Mathematical Statistics 64 (3d ed. 1962).

23. The statistical term “population” refers to the totality of all possible contributors of data for a statistical investigation; a specific population is always defined by naming its unique properties. See J. Guilford, Fundamental Statistics in Psychology and Education 155 (3d ed. 1956).

24. A sample is randomly determined if “every individual in the population has an equal chance of being chosen [as a member of the sample]. The selection of any one individual is also in no way tied to the selection of any other.” Id. at 156. The problems caused by using a sample that was not randomly selected are discussed in id. at 157-58; Social Statistics 142-45, 523-24.
For example, if Democratic judges are found to be more liberal than Republican judges, one could observe that only northern courts were bipartisan. One would then realize that northern Democrats are being compared with northern Republicans because the bi-group or bipartisan criterion of the sample set prevents any comparison between southern Democrats and northern Republicans hearing the same cases on the same court.

II. THE NON-MULTIPLE CORRELATION RESULTS

The main results this writer obtained from such a multiple correlation analysis of judicial characteristics and decisions are exhibited in Table 1. The twelve background variables and two attitudinal variables used in this writer’s prior research appear again for two reasons: (1) to establish continuity between the present and earlier research and (2) to take advantage of the predictive power of the previous background variables. The background variables studied include political party affiliation, pressure group affiliation, ethnic affiliation, pre-judicial occupation, education, age, and size of hometown. The only change made in the set of background variables has been the substitution of the variable of economic liberalism for the variable of liberalism, primarily because the latter lacked the clarity and specificity needed to do a more meaningful analysis.

25. The term “liberal” in this context corresponds to “the viewpoint associated with the interests of the lower or less privileged economic or social groups in one’s society and (to a less extent) with acceptance of long-run social change.” Nagel, Political Party Affiliation and Judges’ Decisions, 55 AM. POL. SCI. REV. 843, 846 (1961).

26. In an unpublished review dated May 26, 1973, of this manuscript and the multiple correlation methods which it uses, Robert Ferber (an editor of the Journal of the American Statistical Association) wrote: “I do not have any major comments on how to improve the goodness of fit . . . . All things considered, I think you have done as much as you could do with these data.”

27. For more detailed information about these background characteristics, see Nagel, Judicial Backgrounds and Criminal Cases, 53 J. CRIM. L.C. & P.S. 333 (1962).

28. The number of variables could be increased by inserting into the regression equation (see notes 68-70 infra) variables that represent (1) the squares or exponents of certain of the 14 variables if non-linear relations were suspected and (2) the product of certain pairs of the 14 variables if joint interaction effects on the dependent variable were suspected. See Social Statistics 459-64, 502-06. Similarly, the number of variables could be decreased (thereby reducing the multicollinearity or intercorrelations among them) by constructing a single score for a related block of variables within the 14 variables. See id. at 457, 503.

29. See note 25 supra.

30. The statement in the mailed questionnaire used to measure the economic liberalism attitude read, “Present laws favor the rich as against the poor.” Judges were asked whether they strongly agreed, mildly agreed, had no opinion, mildly disagreed or strongly disagreed with this statement. The statement used to measure a liberal attitude towards treatment of criminals was, “Our treatment of criminals is too harsh; we
The two dependent variables examined here are both decisional propensities. The first is the tendency of a judge to decide for the defense in criminal cases more often than does his state supreme court. Since all the cases examined were decided by a state supreme court, the issues emphasized were legal rather than factual; that is, the issues presented were often procedural or constitutional questions of law rather than trial-level determinations of fact.

The second dependent variable reflects the tendency of a judge to find more often than his state supreme court: (1) for the administrative agency in business regulation cases; (2) for the claimant in unemployment compensation cases; (3) for the tenant in landlord-tenant cases; (4) for the debtor in creditor-debtor cases; (5) for the consumer in sale-of-goods cases; (6) for the injured party in motor vehicle accident cases; (7) for the labor union in union-management cases; and (8) for the employee in employee injury cases. Calculating a judge’s position with respect to this second dependent variable requires computation of a composite decision score for each judge. To obtain this composite score, the decision scores of each judge for each of these eight categories of cases were added together and then the sum was divided by the number of categories for which he received a score. Thus each judge was assigned a score indicating that his behavior in economic cases was more or less liberal than that of his court.

Table 1 is divided into two parts, with data for the criminal cases in the first three columns and the data for the economic cases in the last three columns. In both parts, the first data column lists the one-to-one (or zero-order) correlation coefficients between each should try to cure, not to punish them.” For more information about the questionnaire, see S. Nagel, Judicial Attitudes and Those of Legislators and Administrators, in The Legal Process From A Behavioral Perspective 199 (1969); Nagel, Off-the-Bench Judicial Attitudes, in Judicial Decision-Making 29 (G. Schubert ed. 1963). The response rate was as follows: 139 judges replied to the questionnaire (with 118 usable replies), 136 failed to reply, and 38 were known to have died before the questionnaires were mailed.

In the correlation and regression analysis used to generate Table 1, the two attitude variables were each coded with five categories or degrees, and the twelve background variables were coded as dichotomous.


32. See note 25 supra.

33. The zero-order correlation coefficient is defined in note 8 supra. This coefficient is computed without recognition of the possible effect of other intervening variables. When these effects are recognized, multiple correlation techniques must be used to measure the correlation between any two variables. If the effect of n other variables is statistically controlled, the correlation coefficient relating two variables is called an nth order partial correlation coefficient.
<table>
<thead>
<tr>
<th>Background Characteristics</th>
<th>Criminal Case Decisions</th>
<th>Economic Case Decisions</th>
</tr>
</thead>
<tbody>
<tr>
<td>(the category hypothesized to be more liberal is mentioned first)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I. Party</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Democrat vs. Republican</td>
<td>+.26</td>
<td>85</td>
</tr>
<tr>
<td>II. Pressure Groups</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Not a member of business group vs. is</td>
<td>+.01</td>
<td>80</td>
</tr>
<tr>
<td>3. Not a member of ABA vs. is</td>
<td>+.12</td>
<td>190</td>
</tr>
<tr>
<td>4. Not a member of nativist group vs. is</td>
<td>+.11</td>
<td>44</td>
</tr>
<tr>
<td>III. Occupations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Not a former businessman vs. was</td>
<td>+.12</td>
<td>97</td>
</tr>
<tr>
<td>6. Not former prosecutor vs. was</td>
<td>+.12</td>
<td>181</td>
</tr>
<tr>
<td>IV. Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Attended low tuition law school vs. high</td>
<td>−.12</td>
<td>70</td>
</tr>
</tbody>
</table>
### V. Age
8. Under 65 vs. over 65

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<tbody>
<tr>
<td>-.02</td>
<td>134</td>
<td></td>
<td>+.08</td>
<td>168</td>
</tr>
</tbody>
</table>

### VI. Geography
9. Practiced initially in a large city vs. small town

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<tbody>
<tr>
<td>00</td>
<td>68</td>
<td>0</td>
<td>-.10</td>
<td>81</td>
</tr>
</tbody>
</table>

### VII. Ethnic
10. Catholic vs. Protestant
11. Low income Prot. denom. vs. high
12. Part non-British ancestry vs. only British

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</tr>
</thead>
<tbody>
<tr>
<td>+.25</td>
<td>59</td>
<td>13</td>
<td>+.05</td>
<td>77</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+.09</td>
<td>108</td>
<td>2</td>
<td>-.03</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+.09</td>
<td>180</td>
<td>2</td>
<td>+.01</td>
<td>213</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### VIII. Attitudes
13. High economic liberalism score vs. low
14. High criminal liberalism score vs. low

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>-.18</td>
<td>75</td>
<td>3</td>
<td>+.11</td>
<td>86</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+.25</td>
<td>75</td>
<td>1</td>
<td>+.07</td>
<td>86</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTALS** (regardless of sign)

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.74</td>
<td>1446</td>
<td>43% = R²</td>
<td>1.21</td>
<td>1752</td>
<td>90% = R²</td>
<td></td>
</tr>
</tbody>
</table>

**AVERAGEs** (regardless of sign)

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>.12</td>
<td>103</td>
<td>4%</td>
<td>.09</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>125</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>.9</td>
<td>9%</td>
</tr>
</tbody>
</table>
background characteristic and a judge's tendency to find for the defense in criminal cases more often than did his state supreme court. The second column shows the size of the sample of judges who supplied data to compute these correlation coefficients. Judges are included in a sample only if (1) they serve on courts that are bi-group with respect to an independent background variable; (2) they have heard cases involving the dependent variable issue; and (3) they reached a nonunanimous decision in at least one of these cases.

All the background characteristics can assume only one of two values; they are described so that the category hypothesized to be more liberal is mentioned first. A positive entry in the first and fourth data columns indicates support for the general hypothesis that there is a correlation between the liberal background characteristics and finding for the defense in criminal cases and for the generally economically weaker party in the civil cases considered. The table shows that political party affiliation is a relatively good predictor of a judge's vote in both criminal cases and civil cases involving economic issues. Religious affiliation is also an indicator of judicial behavior

The correlations in the first column of Table 1 do not correspond exactly to the differences between percentages shown in Nagel, Judicial Backgrounds and Criminal Cases, 53 J. Crim. L.C. & P.S. 333, 335 (1962), because \( r_{xy} \) is not exactly equal to the difference between the percentage of \( +X \) judges who are \( +Y \) and the percentage of \( -X \) judges who are \( +Y \). See Nagel, Applying Correlation Analysis to Case Prediction, 42 Texas L. Rev. 1006, 1009-10 (1964); notes 4 & 8 supra. The substantial deviation with regard to the education variable is explained by a typographical error in the earlier article.

34. See note 22 supra.
35. See note 4 supra.
36. See note 25 supra.

Less significant differences between the two groups of judges were found in Adamany, The Party Variable in Judges' Voting: Conceptual Notes and a Case Study, 63 Am.
in these situations, although it probably does not directly cause a judge to favor the defendant or the state in a criminal case. There is also a positive correlation between a judge's not having been a former businessman (for example, a director, executive or proprietor) and his support for the economic underdog.

Of course, correlation alone does not indicate causation. One must look beyond these correlation coefficients to prove the accuracy of hypotheses explaining the apparent relations. Party affiliation probably does not cause decisional propensities or liberal attitudes; it may, however, reinforce pre-existing attitudes that are partially responsible for a judge's choice of political party. Additionally, re-

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39. This writer attempted to determine the relation between political party (and other related background characteristics) and judicial propensities on the national supreme courts of Australia, Canada, India, Ireland, and the United Kingdom simultaneously, using the same within-court bivariate comparisons described here. The general findings involved substantially lower correlations and thus apparently a lower ideological component than with the American court data, possibly because American courts (1) have more discretion to create judge-made law under the American common law system; (2) have more power to nullify legislative and administrative acts under the American judicial review system; (3) have more ideological leeway given the subjectivity of such key constitutional concepts as equal protection and due process; (4) are often elected, thus injecting partisan and ideological side effects; and (5) can at the state supreme court level be less visible and thus less inhibited in their ideological divisions.


religious affiliation probably causes neither attitudes nor decisional propensities, nor is it usually a result of pre-existing attitudes. Even more than party affiliation, religious affiliation is a consequence of social values transmitted by the individual's family. The explanation for the correlation probably lies in the link between particular religious affiliations and (1) membership in distinct economic classes, (2) urban living and (3) reaction to discrimination. A more detailed analysis of causal relationships necessitates the investigation of correlations among the background variables themselves. Such a study would require statistically controlling for certain variables while allowing others to vary within this same sample of judges.42

There are two negative correlation coefficients of substantial magnitude appearing in the first column of Table 1. These correspond to the independent variables (1) tuition-cost of a judge's law school education and (2) attitude on economic issues. Graduates from law schools with low tuition (especially commuter law schools) might be expected to be more liberal in criminal case dispositions because students at these schools frequently come from lower socioeconomic backgrounds. One might predict that their youthful experiences would give these judges more empathy for the defendant in criminal cases. Each judge in the sample, however, was a member of the state supreme court when this data was gathered. Thus those judges who attended law schools with low tuition experienced a form of the rags-to-riches phenomenon. Persons from modest backgrounds who achieve high economic status are often not particularly tolerant of those of lower economic status.43 These individuals may feel that others, like themselves, should be able to overcome a disadvantaged background. This attitude could explain partially the negative correlation between attending a low tuition law school and being above one's court average on propensity for the defense.

The civil liberties nature of many of the criminal cases in part may account for the negative correlation between an attitude of economic liberalism and partiality for the defendant. Some studies have found positive correlations of only small magnitude or even negative correlations between economic liberalism and civil-liberties liberalism, especially among ethnic Democrats living in large cities.44 More in-

42. See H. Blalock, CAUSAL INFERENCES IN NONEXPERIMENTAL RESEARCH (1964); H. Blalock, CAUSAL MODELS IN THE SOCIAL SCIENCES (1971).
43. For a discussion of the relation between wealth and conservatism, see R. Centers, THE PSYCHOLOGY OF SOCIAL CLASSES (1949); V. Key, PUBLIC OPINION AND AMERICAN DEMOCRACY 121-52 (1961); A. Campbell, P. Converse & D. Stokes, THE AMERICAN VOTER 333-401 (1960) [hereinafter cited as A. Campbell].
44. For a discussion of liberalism and ethnic Democrats, see S. Lipset, POLITICAL MAN (1960); R. Scammon & B. Wattenburg, THE REAL MAJORITY (1970).
fluential than the nature of the cases, however, is the nature of the judges in the sample. This becomes clear when the judges are categorized according to party and religious affiliation, because these were the two background characteristics displaying the strongest correlation with decisional propensities in criminal cases (see Table 1). Examination of the correlation matrix reveals that the variables of political affiliation and of economic attitudes have a positive correlation coefficient, but the correlation coefficient relating a judge's political affiliation and his attitude toward treatment of criminals is negative.

Similarly, the correlation coefficient relating religious affiliation and economic attitudes is positive while the coefficient for religious affiliation and attitude toward treatment of criminals is negative. Thus these correlations suggest that the non-concurring correlations (1) between political affiliation and the two attitudinal variables and (2) between religious affiliation and the two attitudinal variables may explain the negative correlation between liberal economic attitudes and favoring the defense in criminal cases.

For the economic cases the only negative correlation of substantial magnitude involved the variable of geography (see Table 1). One could hypothesize that judges who practiced law in small towns would assume a more conservative position in economic cases than those who practiced in a large city. This notion is supported by the finding that rural people, possibly because of their greater self-sufficiency, are often less sympathetic to the liberal side in economic cases. State supreme court judges who practiced initially in large cities, however, were more likely to be associated with firms that practiced corporate law on behalf of the business side in economic cases; judges who started their legal careers in small towns were more often either sole practitioners or associates of firms in general.

45. See note 19 supra.

46. The matrix reveals that Democratic party affiliation and liberal economic attitudes have a correlation coefficient of +.30 while Democratic party affiliation has a negative correlation coefficient of -.08 with a liberal attitude towards rehabilitation of criminals. Being Catholic had a +.06 correlation with liberal economic attitudes and a correlation of -.16 with a liberal attitude towards criminal rehabilitation. The non-concurring correlations among these four variables seem to be the key to explaining the "inconsistency" between a judge's having liberal economic attitudes and failing to favor the defense in criminal cases. Political affiliation and the attitudinal variables predict the outcome in economic cases more reliably than they predict the outcome in either civil liberties or appellate criminal cases. Nagel, Political Parties and Judicial Review in American History, 11 J. PUB. L. 328 (1962).

47. For a discussion of the relation between urbanism and liberalism, see A. CAMPBELL 402-440; V. KEY, supra note 43, at 99-120.

practice, with professional experience that more likely included criminal defense work.

III. THE RESULTS OF MULTIPLE CORRELATION ANALYSIS

In this section the significance of the entries in the third and sixth columns of Table 1, the columns labelled "additional variance accounted for," will be explained. To enable the reader to appreciate the importance of these entries, however, it is necessary to introduce a few more statistical concepts.

A background characteristic has "accounted for x percent of the variance" in the decisional propensity being studied when the variation among the positions of the judges in the sample with respect to this background characteristic can explain x percent of the variation observed among the judges' positions with respect to the decisional variable. The third data column of Table 1 lists the percentage of variance in judges' tendencies to favor the defense in criminal cases that is accounted for by a specific background characteristic when controlling for all the background characteristics in the table. The sixth data column contains similar information concerning variance in judges' tendencies to favor the economically liberal side in certain classes of civil cases. Columns one and four, by adding to more than 1.00 reveal some information about the overlap among the background characteristics as predictor of judicial behavior in civil and criminal dispositions. The overlap among these independent variables is not great enough that one can obtain a prediction of judicial behavior with maximized accuracy by using only the background characteristic with the highest correlation coefficient. To test the predictive power of all the independent variables interacting with each other, one must resort to multiple correlation analysis.

A. Multiple Correlation

This term indicates the part of the total variation in the dependent variable that can be explained by all the interacting independent variables. One cannot simply add the correlation coefficients or the

49. See id.; data described in note 10 supra.
50. SOCIAL STATISTICS 454-55.
51. If there is a substantial correlation between two independent variables, the second will explain essentially the same variation in the dependent variable as the first. Therefore, to account for as much variation as possible in the dependent variable requires that the independent variables selected have moderately high correlations with the dependent variable and low correlation with each other. Id. at 456.
52. See note 14 supra.
53. SOCIAL STATISTICS 429.
squares of the correlation coefficients\textsuperscript{54} to determine how much of the total variance the independent variables explain. Given the overlap in the percentage of variance for which these variables account, such a computation could result in a sum greater than 100 percent; this would be statistically meaningless. By using more sophisticated multiple correlation analysis, one can eliminate the overlap in variance explained and thus ensure that the sum of the percentages listed in the third or the sixth column does not exceed 100 percent.

\textbf{B. Computation of the Multiple Correlation Coefficient}

This coefficient indicates the strength of the relationship between a dependent variable and two or more interacting independent variables.\textsuperscript{55} The variance-accounted-for figures, which appear as the last entries of columns three and six of Table 1, were obtained by the use of a computer. A correlation matrix that showed the correlations among all the background variables\textsuperscript{56} supplied the input data for the computer program. The program assumed that each correlation was based on the same sample size. However, since the correlations were based on samples of different sizes (see columns 2 and 5 of Table 1), some of the correlations are mathematically inconsistent with each other. Consequently, the computer was unable to calculate the value of standardized regression weights\textsuperscript{57} for some of the characteristics. These standardized regression weights are used in the computation of both the multiple correlation coefficient and the additional variance for which a background variable accounts. Dashes in the “variance accounted for” columns indicate that the computer could not calculate the weight for the corresponding variable.

Another consequence of the disparity in sample sizes was the need to modify slightly the basic formula for calculating additional variance.

\textsuperscript{54} See note 51 supra.
\textsuperscript{55} J. Guilford, Fundamental Statistics in Psychology and Education 392 (3d ed. 1956).
\textsuperscript{56} See notes 19 & 33 supra.
\textsuperscript{57} See J. Guilford, Fundamental Statistics in Psychology and Education 394 (3d ed. 1956). The standardized multiple regression weights are not shown because they are useful only as intermediate mathematical values generated by canned computer programs either (1) to determine the amount of additional variance in the dependent variable explained by each independent variable or (2) to obtain unstandardized regression weights. This latter class of weights are needed to define a regression equation or formula for predicting the position of judges with respect to the dependent variable being studied. See notes 64-67 and accompanying text infra. The unstandardized regression weights are not shown because there is no attempt in this article to develop a 14-variable prediction equation.

The goal here is to say something meaningful about the relative and collective importance of the 14 background variables for predicting or explaining variations in the two decisional variables.
Failure to make the change could have resulted in a set of percentages for which the sum exceeded 100 percent. If $X_1, X_2, \ldots, X_{14}$ denote the 14 background characteristics, let $B_i$ and $r_i$ be the standardized regression weight and the correlation coefficient corresponding to $X_i$. Then for each independent variable $X_i$, the basic formula to calculate the additional variance, $V_i$, for which $X_i$ accounts would be:

$$V_i = r_i B_i.$$  

Then, if $R$ denotes the multiple correlation coefficient,

$$R^2 = \sum V_i = \sum (r_i B_i).$$

That is, $R^2$ is the sum of the additional variances for which each independent variable $X_i$ accounts.\(^{59}\)

\textbf{C. The Meaning of the Multiple Correlation Results}

The third and sixth columns of Table 1 do not greatly alter the rank order of unsigned correlation coefficients from the first and

\(^{58}\) If the sizes of the samples used to compute the correlation coefficient were equal, then the additional variance explained by each independent variable would be calculated by multiplying the correlation coefficient for each characteristic by the corresponding standardized multiple regression weight. J. Guilford, \textit{Fundamental Statistics in Psychology and Education} 397 (3d ed. 1956). \textit{See also} Tanenhaus, Schick, Muraskin & Rosen, \textit{The Supreme Court's Certiorari Jurisdiction: Cue Theory}, in \textit{Judicial Decision-Making} 111 (G. Schubert ed. 1963); Ulmer, \textit{Social Background as an Indicator to the Votes of Supreme Court Justices in Criminal Cases: 1947-56 Terms}, 17 Midwest J. Pol. Sci. 622 (1973). Instead of multiplying the correlation coefficient by the corresponding standardized regression weight to determine the additional variance explained by each independent variable, Bowen squared the partial correlation coefficient. D. Bowen, \textit{The Explanation of Judicial Voting Behavior from Sociological Characteristics of Judges} (unpublished dissertation in Yale University Library, 1965). There does not seem to be any statistical support for Bowen's method, however.

\(^{59}\) The basic formula for calculating the additional variance accounted for has to be slightly modified because the basic formula may result in a set of about 14 percentages whose sum exceeds 100 percent. The basic formula as mentioned is the correlation coefficient (symbolized $r$) times the standardized regression weight (symbolized $B$) for each independent variable. The sum of these products should equal the multiple correlation squared (symbolized $R^2$) if the number of judges used in calculating each correlation coefficient were the same. If the values shown in the third data column are symbolized $V$, then the ratio of $(r \cdot B)$ to the sum of the $(r \cdot B)$'s should be equal to the ratio of $V$ to $R^2$. Thus, each $V$ in the third data column algebraically equals $(r \cdot B \cdot R^2)$ divided by the sum of the $(r \cdot B)$'s. This means (where "$/$" is read "is to," and "$\Sigma$" is read "as") that if $(r \cdot B)/\Sigma(r \cdot B) = V/R^2$, or if $(r \cdot B)/V = \Sigma(r \cdot B)/R^2$, then $V$ equals $(r \cdot B \cdot R^2)$ divided by $\Sigma(r \cdot B)$.

The equation $V = (r \cdot B \cdot R^2)/\Sigma(r \cdot B)$ using the absolute unsigned value of $r \cdot B$ is more meaningful than simply saying $V = r \cdot B$ because $r \cdot B$ can be a negative number, and the variance accounted for cannot be negative since adding any variable increases $R^2$ to some extent. Even without missing data, the above equation provides a meaningful way of allocating the variance accounted for to each individual variable, since all of the $V$'s are positive, they all sum to $R^2$ and they are proportional to $r \cdot V$'s.
fourth data columns, respectively.60 In most cases, those background variables with comparatively large correlation coefficients also accounted for a relatively large part of the total variance explained. One should note, however, that a background variable that has a low correlation with one of the dependent variables may still increase the amount of variance explained by, in effect, filtering out irrelevant portions of other background variables with which it correlates.61

By itself each judicial characteristic cannot explain a large part of the variance among judges' decisional propensities. For example, if one were to rely only upon political party affiliation to predict a judge's tendency to find for the defense in criminal cases, one could account for only 7 percent of the variance (or .26 squared); using the twelve variables for which standardized regression weights could be computed, one can account for 43 percent of the variance. In fact, one can account for 25 percent of the variance by just using the variables of political party affiliation, attitude on economic issues and attitude toward treatment of criminals. Column 3 of Table 1 shows that these three variables had substantial, non-redundant correlations with a tendency to hold for the defense in criminal cases.

The effect of multiple correlation used to interpret data collected from judges hearing civil cases involving economic issues is more dramatic. Without this more sophisticated analysis, political party affiliation accounts for only 14 percent of the variance.62 When adjustments for the effect of other variables are made, however, political party affiliation can account for 44 percent of the variance. If the sum of the additional variance explained by each of the ten variables for which the computer could find standardized regression weights (see Table 1, column 6) is computed, approximately 90 percent of the variance of the dependent variable can thus be explained. While correlation analysis focuses upon the strength of relationships among the

60. This statement can be interpreted to mean that if the magnitude of the correlation of \(X_i\) was greater than that of \(X_i'\), then \(X_i\) also explained more of the variance in the dependent variable than \(X_i'\) did.

61. See J. Guilford, Fundamental Statistics in Psychology and Education 402-03 (3d ed. 1956). The nationality of a judge's ancestors may be an example of such a filtering or suppressor variable, since it has a low correlation with a judge's decisional propensities in economic cases, but a high correlation with political party affiliation. Its removal from the regression equation, however, resulted in a substantial reduction in the multiple correlation coefficient. It may exert a filtering effect by removing a portion of the non-ideological component from the party variable because some ethnic groups tend to join the Republican or Democratic party more from inertia and group reinforcement than because of the party's ideology.

62. To calculate the variance in judges' decisional propensities in economic cases explained by party affiliation while ignoring the effect of the other variables, one must square the correlation coefficient, .37 (see Table 1). Id. at 378.
variables,\textsuperscript{63} regression analysis uses the independent variables to define an equation that explains and predicts the value of the dependent variable.\textsuperscript{64} If one constructs a regression equation to predict a judge's position in appropriate civil cases from the ten "usable" variables,\textsuperscript{65}

\[ R^2 = .90 \text{ and } R = .95 \]

imply that there will be a 68 percent reduction in the degree of error that would result if one simply predicted that each judge would have the average of all the scores of the total sample.\textsuperscript{66}

\textbf{D. An Alternative to Multiple Correlation to Measure Prediction Accuracy}

In this paper, the writer has used the total variance explained by a set of independent variables to measure the accuracy of these variables for collectively predicting judicial behavior in a limited context. There is, however, an alternative approach that is possibly more appealing to an individual's common sense. Regression analysis may be used to predict decisional propensity when specific values are assigned to each of the background variables. For example, one can derive the regression equation to predict a judge's propensity to hold for the defense in criminal cases. Then he can apply this equation to each judge to predict whether his decisional score will be above or below his court's average score. A judge is labeled a misprediction if either his actual score or the score predicted on the basis of his background characteristics is above the court average and the other is below. The percentage of all predictions that are mispredictions offers another measure of accuracy of the predictions.\textsuperscript{67} Although its meaning is initially more difficult to comprehend, prediction accuracy measured by the "variance-accounted-for" method should correspond reasonably well to that calculated by the mispredictions method.\textsuperscript{68}

\textsuperscript{63} Social Statistics 454.
\textsuperscript{64} Id. at 429-30.
\textsuperscript{65} The "usable" variables are those for which a standardized regression weight could be calculated, that is, those variables for which a dash does not appear in column 6 of Table 1.
\textsuperscript{66} The reduction in error is the result of subtracting $\sqrt{1 - R^2}$ from 1.00, where \( R^2 = .90 \). The quantity $\sqrt{1 - R^2}$ is called the coefficient of alienation and indicates the lack of relationship between the dependent and independent variables. J. Guilford, \textit{Fundamental Statistics in Psychology and Education} 375 (3d ed. 1956).
\textsuperscript{67} This mispredictions method perhaps should be called the "mispostdictions" method since the events being predicted have already occurred.
\textsuperscript{68} This mispredictions method is used in Nagel, \textit{Predicting Court Cases Quantitatively}, 63 \textit{Mich. L. Rev.} 1411 (1965); Ulmer, \textit{Dissent Behavior and the Social Background of Supreme Court Justices}, 32 \textit{J. Pol.} 580 (1970). The mispredictions method could not be
E. Sampling Limitations Upon the Statistical Methods

Both the variance-accounted-for method and the mispredictions method described the strength of the multiple correlation. Neither indicates the probability that the multiple correlation coefficient might really be zero and that chance sampling distortion\(^6\) is responsible for the apparent magnitude of the coefficients. Statistical methods indicate that the likelihood of obtaining a multiple correlation as large as those obtained in Table 1, namely .66 and .95, from an average sample size of 103 and 125 respectively is less than one in one thousand if the multiple correlation coefficient is really zero.\(^7\) (Recall that \(R = 0\) would indicate that there was no linear relationship among the dependent and independent variables.)\(^7\) One could also make similar calculations to test the statistical significance of each correlation coefficient and each additional variance explained by the background characteristics.\(^7\) The value of performing such tests upon these statistics, however, is questionable partly because these tests assume that (1) the data has a normal curve distribution; (2) the variances of all the variables are equal; and (3) the variables satisfy a linear equation of the form \(Y = \Sigma (b_i X_i) + a.\)\(^7\) The data collected from the sample may fail to meet these conditions adequately. Moreover, the sample of judges used was not randomly selected from the population of judges; it represents the usable sample of state supreme court judges serving in 1955 who satisfied the other requirements discussed in the preceding two sections of this article.\(^7\) It is also true that statistical significance depends more upon the size of the sample than upon the magnitude of the correlation obtained.\(^7\) Finally, few
would argue that the background characteristics of judges have a zero correlation with their judicial decisions, although some do contend that the correlation is low or, in some sense, not high enough.  

IV. SOME CONCLUSIONS

The methodological purpose of this article has been to show some of the things that can be done using multiple correlation techniques to supplement non-multiple correlation techniques in analyzing the relations between judicial background and attitudinal characteristics and judicial decisions. In addition to this methodological purpose, the article has further indicated the importance of political party as a predictor of judicial propensities in criminal cases and, especially, in cases involving economic conflict. It has also indicated in the multiple correlation context that the religious orientation of judges is an important predictor of their decisional propensities in criminal cases and their pre-judicial association with the business world is an important predictor in economic cases.

Although judicial backgrounds may be useful in predicting those judges or categories of judges who will be above or below the average of their court on various types of decision scores (or at least those scores associated with economic or criminal cases), judicial background variables are not as useful for predicting the outcomes of cases in general. This is so largely because being above or below the

76. Grossman says: "Bowen's findings cast clear doubt on the explanatory power of background variables taken by themselves." Grossman, Social Backgrounds and Judicial Decision-Making, 79 Harv. L. Rev. 1551, 1561 (1966) (footnote omitted). Murphy and Tanenhaus quote Bowen as saying, "[T]he sociological background characteristics of these judges . . . are generally not very helpful." W. Murphy & J. Tanenhaus, The Study of Public Law 107 (1972). In a paper summarizing his results, however, Bowen says:

"[T]he predictive power of these variables [party, region, religion, prestige of schools attended, age, and tenure] is generally quite low when they are taken by themselves . . . .

. . . [W]hen we take all six independent variables and examine their total contribution the picture brightens considerably. The six sociological characteristics together will explain anywhere from 20% to over 40% of the variance in these cases. And to put the situation bluntly, explaining somewhere around a quarter to better than a third of the variance is not, in current political science, to be sneezed at.


77. For a list of other articles reaching this conclusion, see note 37 supra.

78. For a definition of decision score see note 14 supra.
average of one’s court is determined only by those cases in which the judges on one’s court differ, and such cases may only constitute about 12 percent of the cases heard by the average state supreme court. Even in those cases, one may be more interested in knowing whether the plaintiff or the defendant will win and why than in knowing how the judges’ votes will be split. To make such predictions requires an analysis of the factual and legal variables present in the cases used for the predictions and in the cases to be predicted; one or more factual variables may relate to the dominant or plurality party, religion, or pre-judicial occupation on the court.

In spite of the limitations on judicial background analysis for predictive purposes, such analysis does help improve the legal process. It is useful for providing a better understanding of the determinative factors in judicial decision-making. It also enables one to demonstrate better the need for making judges more representative of the people over whom they judge, since it enables one to show that certain background characteristics have a substantial relation to certain judicial propensities. Furthermore, if one finds a relatively high correlation between the background characteristics of some judges and their decisional propensities, then one can make statements about methods of decreasing these correlations by analyzing how low-correlation judges, or their courts, differ from high-correlation judges. Finally, an analysis of these relations can provide some

79. One study found dissenting opinions in an average of 15% of the state supreme court cases investigated. On particular supreme courts dissent was present in between 49% (New York) and 0% (Tennessee) of the cases. See Canon & Jaros, State Supreme Courts—Some Comparative Data, 42 STATE GOVERNMENT 260, 264 (1969).

80. S. NAGEL, THE LEGAL PROCESS FROM A BEHAVIORAL PERSPECTIVE (1969), attempts to discuss the legal process by focusing upon its legal, factual and personnel aspects rather than by examining only the personnel aspect totally in isolation. See id. at 132-72.

81. For a good analysis of the causal role of background and attitudinal characteristics, along with legal and factual elements, in determining one kind of judicial propensity, see J. HOGARTH, SENTENCING AS A HUMAN PROCESS (1971), especially 211-28, 341-82. In comparing judges’ sentencing patterns, however, Hogarth does not control for the nature of the crimes or cases that the judges hear; some judges may hear more serious cases and their doing so may correlate with their background characteristics. For example, certain types of judges (e.g., female, older or Catholic judges) may hear or not hear a disproportionate number of certain types of cases (e.g., rape, juvenile or abortion cases respectively) because of their interest or because of the control counsel may exercise in allocating the cases. These imbalances in case allocation may thereby make certain judges appear to be more severe or lenient than their fellow judges.


83. For example, appointed or long-tenured judges may have a lower correlation between their party affiliation and decisional propensities than elected or short-tenured judges. See S. NAGEL, COMPARING ELECTED AND APPOINTED JUDICIAL SYSTEMS (1973).
data that might be helpful to voters in the selection of judges and to lawyers in the selection of jurors.\textsuperscript{84}

Although this writer has tried to extend raw judicial background analysis to these broader purposes, much remains to be done along the lines suggested. It is hoped that the methods described here and in materials cited in the footnotes will be applied to other courts, judges, cases, countries and time periods to obtain more findings and to build better theories for understanding and improving the legal process.\textsuperscript{85}

\textsuperscript{84} See id.; Nagel & Weitzman, Sex and the Unbiased Jury, 56 JUDICATURE 108 (1972).

\textsuperscript{85} A good recent example of the application of multiple correlation analysis to judicial backgrounds and decisions is S. Goldman, Voting Behavior on the U.S. Courts of Appeals Revisited (paper presented at the 1973 APSA annual meeting). Goldman's paper contains a larger sample of judges than does Ulmer's recent Midwest Journal study, supra note 58, but does not provide equally good control over the uniformity of the cases heard by the judges.