# The Political Consequences of Electoral Laws, 1945-85

Arend Lijphart

Stable URL:

*The American Political Science Review* is currently published by American Political Science Association.

# THE POLITICAL CONSEQUENCES
# OF ELECTORAL LAWS, 1945-85

AREND LIJPHART
University of California
San Diego

*A* systematic analysis of the relationships between the main electoral system variables (electoral formula, district magnitude, and ballot structure) and electoral outcomes (the degrees of disproportionality and multipartism) in the 20 Western democracies from 1945 to 1985—representing 32 distinct electoral systems (an electoral system being defined as a set of elections held under basically the same rules)—shows that the effects of both formula and magnitude on proportionality are very strong, much stronger than Douglas W. Rae and subsequent researchers have suggested; that on the other hand, their effects on the number of parties participating in elections is surprisingly weak; and that ballot structure affects the degree of multipartism only in single-member district systems. These findings suggest that strategic behavior by politicians and voters plays a less important role in reducing multipartism than is usually assumed.

*W*hen the first edition of Douglas W. Rae's *The Political Consequences of Electoral Laws* was published in 1967, it was almost instantly recognized as a great scholarly breakthrough. A second edition was published in 1971, and it has maintained its stellar reputation as the most important book in the field of comparative electoral systems ever since. More recent major innovative books have explicitly used it both as a model and as a point of departure (Katz 1980, 20; Nohlen 1978, 14), and contemporary authors writing on the subject still unfailingly cite it. It received the 1989 George H. Hallett Award of the American Political Science Association's Representation and Electoral Systems section.

As the first systematic broadly comparative study of electoral systems and as a powerful stimulus to subsequent research, it clearly deserves its reputation as a classic in the field. On the other hand, it has been accorded this status without suf-ficient critical attention. In the preface to the second edition, Rae (1971, vii) himself chides "the over-gentle colleagues who reviewed the original edition."[1] In fact, the book suffers from a variety of conceptual, methodological, and empirical weaknesses, which are so grave and numerous that they cast doubt on all of Rae's conclusions. Moreover, some of his conclusions are so surprising—especially the finding that differences in proportional representation (PR) formulas have only minor effects and that neither two-tier districting systems nor the ballot structure have any effect at all—that they cry out for a critical new examination.

My purpose here is to reanalyze Rae's classic study with more accurate data, stronger hypotheses, and better methods. I shall also use *more* data: to Rae's elections (of the lower or only houses of the legislature) in the 20 Western democracies during the 20-year period from 1945 to 1964, I shall add the few elections in

1945–64 missing from Rae's book and, more importantly, all elections in these countries during the subsequent 21-year period from 1965 through 1985.[2] In order to save space and because I found no major differences between the patterns in Rae's 1945–64 period and in the entire 1945–85 period, I shall present the results for the latter only.

My reanalysis and update will yield conclusions that are significantly different from the relationships that Rae finds between his variables. Rae defines three aspects of the electoral system as his independent variables: (1) the electoral formula, such as plurality, various forms of PR, and so on; (2) the average district magnitude, that is, the average number of legislators elected per district; and (3) the ballot structure, which may or may not allow the voters to split their votes between two or more parties (pp. 15–46). His two dependent variables are (1) the proportionality of the electoral outcome, which is the immediate or (in Rae's terminology) "proximal" effect of the electoral system's translation of votes into seats; and (2) the degree of multipartism that is—or is presumed to be—the indirect or "distal" effect of the electoral aystem (pp. 47–64, 67–68, 84–85).

Rae examines five major relationships between his independent and dependent variables. With regard to all five of these, my conclusions will diverge from Rae's in crucial respects: (1) the relationship between the electoral formula and the proportionality of the election result is much stronger than Rae finds; (2) the link between district magnitude and proportionality is also much stronger, especially as far as concerns the effects of two-tier districting systems (which Rae claims to have no effect); (3) the relationship between the electoral formula and the degree of multipartism is much weaker than in Rae's finding; (4) similarly, district magnitude and multipartism are much less strongly and perfectly related than Rae claims; (5)

the link between ballot structure and multipartism hypothesized and rejected by Rae is in fact valid for one major category of electoral systems—single-member district systems. In other words, the proximal effects of electoral systems are much stronger than their distal effects. The theoretical significance of this finding, which I shall discuss in greater detail in the concluding section, is that strategic (or insincere) voting and strategic elite behavior play a considerably less important role in helping the larger, and hurting the smaller, parties than is usually supposed.

How do my methods differ from, and how are they superior to, Rae's? Five differences are of importance throughout the analysis. First in contrast with Rae's treatment of each election as a different case, my unit of analysis is the electoral system, defined as one or more elections held under basically the same or closely similar rules. For instance, instead of counting the 11 Israeli elections as 11 separate cases, I have only two cases: the PR system that used the d'Hondt formula (the 1949 election and the four elections from 1973 to 1984) and the system under the largest-remainders rule (the six elections in the 1951–69 period). My approach avoids the artificial and deceptive inflation of the weight of the available evidence; elections under the same rules are not really independent cases but merely repeated operations of the same electoral system. It also avoids the related problem of artificially weighting the evidence. For instance, France held only 3 elections under the pure d'Hondt rule while the Netherlands had 12; but this is not a good reason to give the French evidence only one-fourth the weight of the Dutch. This approach yields 32 cases (based on 255 elections) in the 1945–85 period.

Second, I use the evidence of all of the available cases as much as possible. For instance, in contrast with Rae, who simply disregards the difficult cases of two-tier systems that use different formulas at

their two levels, I determine which level is of predominant importance and classify the electoral system according to the formula at this level. This procedure increases the number of cases in my analysis from 20 to 31; the only case that I cannot use for the purpose of studying the effects of electoral formulas is France (1951–56), because it used majority, d'Hondt, and largest remainders formulas in such a complex way (in different parts of the country, not at different levels) that they cannot be disentangled.

Third, since Rae finds that both formula and magnitude strongly affect proportionality and multipartism, it is a curious omission in his analysis that he fails to examine the possible interaction of his two explanatory variables. I correct this omission by systematically controlling for the influence of the other independent variable.

Fourth, in order to measure the degree of disproportionality of different electoral systems, I use John Loosemore and Victor J. Hanby's (1971) index $D$. It has become the most widely used index of disproportionality (see, e.g., Mackie and Rose 1982, 411–12; Rose 1984; Taagepera and Shugart 1989, 104–11). $D$ is the total percentage by which the overrepresented parties are overrepresented—which is, of course, the same as the total percentage of underrepresentation. In order to calculate $D$, the absolute values of all differences between the parties' vote and seat shares are added and then divided by 2. Rae's measure $I$ appears to be similar. It, too, entails the addition of all vote-seat share differences; but this sum is divided not by 2 but by the number of parties. As Richard S. Katz (1980, 140) has pointed out, Rae's index $I$ has the grave defect of "giving too much weight to small parties; at the extreme, if the infinite number of (hypothetical) parties that receive no votes and obtain no seats is included, every electoral system would appear

perfectly proportional." Rae (p. 84) tries to avoid this problem by disregarding parties with less than .5 percent of the vote, but this arbitrary cutoff point is still quite low; the presence of several parties with just over .5% of the votes will depress $I$ even if these parties fail to win any seats.[3]

Finally, a relatively minor difference between Rae's methods and mine concerns the measure of multipartism. Rae uses a large number of indicators of multipartism—such as the total number of parties contesting an election, the total number elected to the legislature, the vote and seat shares of the largest party, and the vote and seat shares of the two largest parties combined—but his most important and comprehensive measure is the fractionalization of the party system, which is sensitive to both the numbers of parties and their relative sizes (pp. 47–64, 67–68, 84–85). I shall use an adaptation of Rae's fractionalization index—Laakso and Taagepera's (1979) "effective number of parties"—which carries exactly the same information as Rae's index but is more meaningful. For instance, in a party system with two equally strong parties, the effective number of parties is exactly 2.0; for three equal parties it is 3.0; for two strong parties and one weaker party, it will be somewhere in the neighborhood of 2.5. Rae's fractionalization indexes can be easily converted into the Laakso-Taagepera measure.[4] The effective number of parties (as well as the index of fractionalization) can be calculated on the basis of either the parties' vote or seat shares. The former is the better indicator of the long-term nature of the party system. It is affected by the operation of the electoral system in previous elections but not yet by the translation of votes into seats in the current election. I shall therefore use the effective number of *elective* (instead of legislative) parties as my indicator of multipartism.

## Electoral Formulas and Electoral Disproportionality

Rae finds, as expected, that plurality and majority formulas are considerably less proportional than PR but, rather surprisingly, that there is not a great deal of difference within the family of PR systems. The main reason for the latter, unexpected conclusion is Rae's improper classification of the different PR formulas. He hypothesizes that highest averages (or divisor) formulas yield less proportional results than largest remainders (quota) formulas. The distinction between these two types of list PR formulas is indeed an important one—but mainly as regards the practical procedures election officials have to use to allocate seats to party lists. However, the two groups of methods should not be expected to differ with regard to the proportionality they produce, since the degree of proportionality depends on the particular quota that quota methods use and the particular divisor used by divisor methods. This means that differences with regard to proportionality should occur *within* each group instead of *between* them.

Among the highest averages methods, the d'Hondt formula (which uses the divisor series 1, 2, 3, 4, etc.) is the least proportional and systematically favors the larger parties. It contrasts with the Sainte-Laguë formula, which, in the original form proposed by its inventor (using the odd-integer divisor series 1, 3, 5, 7, etc.), approximates proportionality very closely and treats large and small parties in a perfectly evenhanded way. In practice, the Sainte-Laguë method is more often used in a modified form that uses 1.4 instead of 1 as the first divisor, thereby making it harder for small parties to gain their first seats and hence reducing the proportionality of the election result to some extent. According to their logical properties, therefore, the three highest averages methods can be placed on the following scale from the most to the least proportional: pure Sainte-Laguë, modified Sainte-Laguë, and d'Hondt (see Balinski and Young 1982, 60–66; Lijphart 1986, 172–75).

Similar differences occur within largest remainders (LR) systems. The oldest and best known of these simply uses as its quota the total number of valid votes cast in a district divided by the district magnitude ($m$, the total number of seats available in the district). This quota, usually referred to as the Hare quota, is impartial as between small and large parties and tends to yield closely proportional results. Less proportional outcomes are produced by the Droop quota, which divides the votes by $m + 1$ instead of $m$, and the Imperiali quota, which uses $m + 2$ as the denominator.[5] The use of these lower quotas means that there will be fewer remaining seats to be allocated and hence also more wastage of remaining votes, which is especially harmful to the smaller parties and results in a decrease in proportionality. It can be shown that when the quota is lowered even further, to the extent that there will not be any remaining seats, the outcome becomes exactly the same as that of the d'Hondt formula (Van den Bergh 1955, 68–72). In preferential PR, usually referred to as single transferable vote (STV) systems, the quota is as important for the proportionality of the electoral outcome as in list-PR largest-remainders systems. The one case of STV among the Western democracies—Ireland—uses the Droop quota.

This discussion suggests a much stronger and more plausible hypothesis about the effects of PR formulas on the proportionality of the election result than Rae's hypothesis, which is based on the twofold distinction between largest-remainders and highest-averages methods. Mine is based on a threefold classification: (1) pure Sainte-Laguë and LR-Hare are likely to be the most proportional; (2) modified Sainte-Laguë, LR-Droop, LR-

**Table 1. Average Degrees of Disproportionality of Electoral Systems Classified by Electoral Formula and Adjusted District Magnitude, 1945–85 (%)**

| Adjusted District Magnitude | LR-Hare and Pure Saint-Laguë | LR-Droop, LR-Imperiali, Modified Sainte-Laguë, and STV-Droop | d'Hondt | Plurality and Majority | All[a] |
|---|---|---|---|---|---|
| 1–1.1 | — | — | — | 12.93 (6) | 12.93 (6) |
| 1.1–5 | — | 4.60 (1) | 8.51 (3) | — | 7.53 (4) |
| 5–10 | — | 5.18 (3) | 5.83 (6) | — | 5.61 (9) |
| 10–25 | 2.81 (2) | — | 4.28 (3) | — | 3.69 (5) |
| 100–150 | 2.46 (3) | 3.53 (2) | 4.39 (2) | — | 3.32 (7) |
| All[a] | 2.60 (5) | 4.53 (6) | 5.87 (14) | 12.93 (6) | 6.45 (31) |

*Source:* Based on data in Mackie and Rose 1982, 1983, 1984; Mackie 1985, 1986; Ornstein, Mann, and Malbin 1987, 47–48; and Luxembourg, Service Central de la Statistique 1984, 120–21.

*Note:* The numbers of cases on which the percentages are based are in parentheses.

[a]Except France of 1951–56.

Imperiali, and STV-Droop should be less proportional; and (3) d'Hondt is likely to be the least proportional of the PR formulas.

The bottom row of Table 1 shows that this hypothesis is strongly supported by the evidence. The plurality and majority systems are more than twice as disproportional as d'Hondt PR, and the d'Hondt systems are more than twice as disproportional as the LR-Hare and pure Sainte-Laguë systems; the in-between PR systems are also, as hypothesized, roughly intermediate in terms of their degree of disproportionality. These figures are based on 31 of the 32 cases, as explained earlier.[6] My findings partly support and partly contrast with Rae's. Rae (pp. 96, 106) finds a similar difference between plurality-majority and the least proportional PR systems: 3.96% and 1.78% respectively (measured in terms of Rae's *I*). But the difference between his two types of PR is quite small: 1.22% and 1.78% (also measured in terms of *I*).

Given the weakness of Rae's hypothesis about PR systems, how can we account for the fact that he finds *any* difference between his two types? After carefully checking all of the likely explanations, I found that neither Rae's different methodology nor his empirical errors (of the 56 list PR elections that according to Rae's own criteria, should have been included in his analysis, 28 are misclassified or omitted) provide the answer. The explanation is that d'Hondt happens to be the most frequently used highest average formula: of the 18 highest averages cases, 14 are d'Hondt. Since d'Hondt is also the least proportional of all PR methods, it is now clear why Rae's category of highest averages turns out to be less proportional than that of his largest remainders. His finding, modest as it is, is entirely fortuitous.

Table 1 also shows the indices of disproportionality of the PR formulas when district magnitude is held constant. Within each category of adjusted magnitude (to be defined in the next section), the differences between the formulas are reduced to some extent; but they still show up clearly and they are all in the expected direction.

## District Magnitude and Electoral Disproportionality

The strongest relationship found by Rae is that between district magnitude and proportionality: as magnitude increases, disproportionality goes down. He compares the effects of electoral systems classified according to five categories of average district magnitude, $m$: (1) single-member districts where $m = 1$, (2) $m$ between 2 and 6, (3) $m$ between 6 and 10, (4) $m$ between 10 and 20, and (5) $m$ between 100 and 150, which occurs in the two countries with a single nationwide district, Israel and the Netherlands. Rae never explains why he selected these particular five categories; but with one exception the dividing lines make good sense, since they coincide with natural breaks in the distribution of the magnitudes. The exception is that the natural discontinuity in the range between single-member districts and a district magnitude of 10 occurs at about $m = 5$ instead of $m = 6$. Another small improvement is to make 1.1 the dividing point between the two lowest categories. This takes care of the few deviations from single-member districts in the plurality and majority countries, which are all essentially single-member district systems; and it removes Rae's awkward gap between $m = 1$ and $m = 2$. A final helpful adjustment is to expand the 10-to-20-seat category to 10-to-25 so that it can accommodate the Austrian case, which since 1971 has had a magnitude of slightly higher than 20.[7]

Average district magnitude is defined as the average number of seats (or representatives) per district; and it can be calculated easily by dividing the total number of seats in the legislature by the number of districts. Only with regard to two-tier districting systems do we run into complications. The solution proposed by Rae (p. 21) is that "this problem is tentatively resolved by counting the total number of districts at both levels in the computation of average magnitudes." This is an unsatisfactory solution because its effect is to make the average magnitude lower than it would be on the basis of either the low-tier or the high-tier districts by themselves. For instance, from 1945 to 1970 the Austrian 165-member legislature was elected in 25 low-tier and 4 high-tier districts. Counting the lower tier only, the average magnitude would be 6.6; counting the higher tier only, it would be 41.2. The most reasonable assumption is that the "true" magnitude should be somewhere between 6.6 and 41.2. According to Rae's definition, however, it is 5.7—well below 6.6. Rae states that his solution is only tentative, but he never reconsiders it. Since I do not want to prejudge the effect of the superimposition of a higher tier of districts (which is often a single national district), my own tentative and temporary solution is to calculate average magnitude solely on the basis of the lower tier.

Rae's (p. 124) hypothesis concerning the impact of two-tier or "complex" districting is eminently plausible: "One would expect complex districting—the use of two tiers of districts—to increase proportionality at any given level of magnitude." However, Rae immediately rejects this hypothesis. Without supplying precise figures, he states that "the four systems based on complex districting—Icelandic, German, Austrian, and Danish—do not behave in accordance with this expectation. For two of them, the German and the Danish, disproportions are below average for their respective levels of district magnitude. But for the Austrian and Icelandic systems, complex districting associates itself with greater-than-average disproportions, given their levels of district magnitude." It is worth noting that Rae's conclusion, for once, is based on a controlled test. He does not simply compare all complex-districting cases with all simple-districting cases but controls for district magnitude.

Nevertheless, Rae's negative finding is

unsatisfactory for several reasons. One is that he fails to recognize and include Belgium and Italy as complex-districting cases. Second, he suddenly shifts from elections to countries as his units of analysis and thereby ignores the major electoral law changes in Iceland in 1959 and in Germany after the 1953 election. Third, his conclusion is so surprising that a closer look at the deviant cases is called for. Rae (p. 124) gives up too quickly: "Since no plausible explanation is available . . . , it must be concluded that complex districting does not produce greater proportionality than simple districting at any given level of district magnitude." In fact, the deviant Austrian and Icelandic cases do have some special features that may explain their unexpected disproportionality. In the Icelandic electoral system from 1946 to 1959, more than half of the seats at the lower tier were in single-member districts and almost a third in two-member districts. The few adjustment seats available at the national level could not neutralize the disproportionalities caused by these low magnitudes. The Austrian electoral system from 1945 to 1970, despite the country's relatively small size, had four higher-tier districts instead of one national district.

The Austrian case suggests a general explanation. Complex-districting systems typically try to restrict the benefits obtainable at the higher tier to parties that have received a minimum number of votes or seats at the lower tier. Since this entails discrimination against the smallest parties, it also places a limit on the proportionalizing effect of two-tier districting systems; and it means that the higher-tier districts must be large, preferably nationwide, in order to make the election result appreciably more proportional. A stronger hypothesis than Rae's would therefore be that complex districting with nationwide—or almost nationwide—higher-tier districts (which can be called *strong* complex districting) yields greater proportionality than other forms of com-

plex districting or simple districting. The one case of near-nationwide districts is Austria since 1971, which has used only two higher-tier districts. For the reasons just outlined, the 1946–59 Icelandic electoral system should not be included among the strong complex-districting cases. When the disproportionalities of the two types of districting systems are contrasted, the strong complex-districting systems do indeed turn out to be more proportional within each category of magnitude than the other systems.

I can now propose a modification in my tentative definition of average district magnitude: strong complex-districting systems should be classified one category higher than what their lower-tier magnitude would entitle them to. I shall call this their *adjusted* district magnitude. For instance, since 1970 Sweden has had a lower-tier magnitude of 12.5 seats but also a single, nationwide, higher tier; its adjusted magnitude is therefore in the 100-to-150-seat category together with Israel and the Netherlands. The relationship between adjusted magnitude and disproportionality is considerably stronger than that between magnitude, as I tentatively defined it, and disproportionality. The last column of Table 1 presents the average degrees of disproportionality in the five classes of adjusted magnitude. The greatest difference again occurs between the plurality-majority systems (which are also the single-member district systems) and the least-proportional category of PR systems. Within the family of PR systems, the differences among the different categories of magnitude are roughly similar to the differences found earlier among the several formulas. These findings are in sharp contrast with Rae's (pp. 114–24) conclusion that district magnitude is a more potent force than the electoral formula, which has become the conventional wisdom (Sartori 1986, 53, 66; see also Taagepera and Shugart 1989, 112–25).

What is the effect of each of the inde-

pendent variables—electoral formula and district magnitude—on the dependent variable of proportionality when the other independent variable is controlled? This question is relevant only for the PR systems since the non-PR systems do not vary with regard to magnitude. Table 1 also shows the indices of disproportionality of all PR cases classified according to both effective district magnitude and electoral formula. When district magnitude is held constant, the differences between the formulas are reduced but not at all eliminated. When we control for electoral formula, sizable differences between the magnitude classes remain in the d'Hondt systems; but the differences are less impressive for the other formulas. The reason why these relationships now appear less strong is that effective district magnitude and electoral formula are themselves correlated. As the numbers in parentheses in Table 1 show, the most proportional formulas (LR-Hare and pure Sainte-Laguë) occur only in the two most proportional classes of adjusted magnitude (those larger than 10 seats); and the majority of the least-proportional formulas (d'Hondt) are used in the least-proportional magnitude groups (less than 10 seats).

Because Table 1 has several empty cells, its evidence is somewhat ambiguous. Moreover, there are a couple of cells with values that are out of monotonic order. Nevertheless, the overall pattern is one of interaction between formula and magnitude but also of the independent impact of each of them on the proportionality of the electoral outcome. Further evidence of this pattern is provided by Figure 1, which shows the changes in disproportionality due to major electoral law changes *in the same country*. For instance, Sweden first shifted from d'Hondt to modified Sainte-Laguë and subsequently to a much higher adjusted magnitude. Because country-specific characteristics are now also controlled, we have a rigorous test of the ef-

fect of magnitude and formula on disproportionality. The nine major electoral law changes *all* produce the expected changes in the degree of disproportionality. With the exception of Israel's return from LR-Hare to d'Hondt after the 1969 election, all of these major changes entailed shifts to more proportional rules.
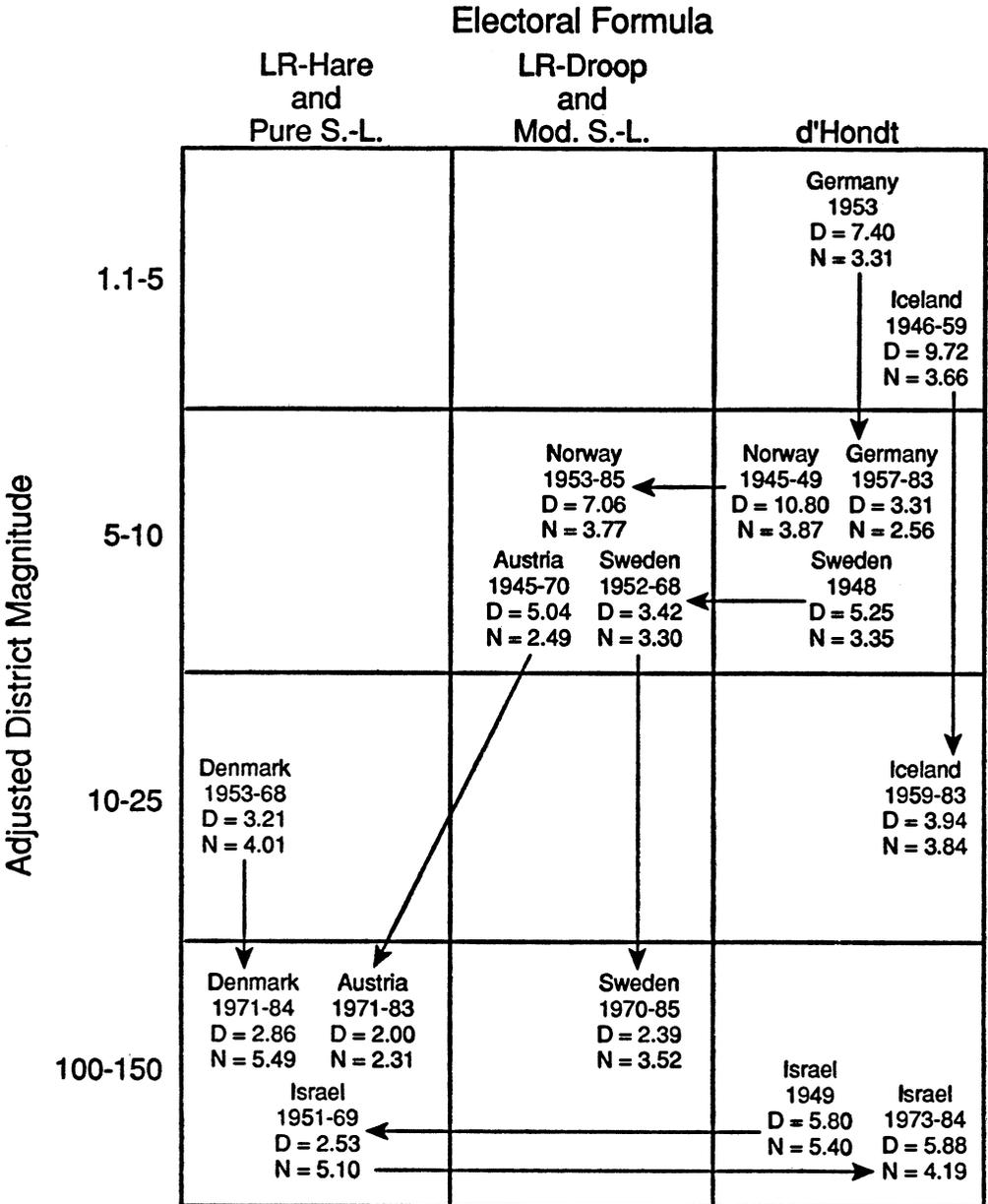
To sum up, district magnitude was found to have a very strong effect on proportionality, confirming Rae's conclusion. This effect remains strong—albeit not *as* strong—when the electoral formula is held constant, a control that Rae fails to apply. And contrary to Rae, complex districting was found to make the election result considerably more proportional.

## Formula, Magnitude, and Multipartism

The discussion of the effect of the electoral formula and district magnitude on proportionality has paved the way for a more expeditious treatment of their effect on multipartism. The reason is that proportionality is the logical link that connects these electoral system variables to the number of parties: the more proportional the electoral system is, the more favorable it is for small and new parties and hence the more it will allow—some would say *encourage*—a large number of parties. Of course, there are also other important causes of multipartism, particularly the number and depth of the cleavages in a society (Taagepera and Grofman 1985). We should therefore not expect a very strong correlation between magnitude and formula on the one hand and multipartism on the other. Rae (p. 141) correctly points out that "party systems are influenced by many variables—social, economic, legal, and political. [The] electoral law . . . is to be counted only one of many determining forces. And it is, secondly, impossible to sort out all the contributing factors, or to assign even ap-

Figure 1. Average Disproportionality and Average Number of Elective Parties of Electoral Systems in Change, 1945–85

## Electoral Formula

|  | LR-Hare and Pure S.-L. | LR-Droop and Mod. S.-L. | d'Hondt |
|---|---|---|---|
| **1.1-5** | | | Germany 1953 D = 7.40 N = 3.31 <br> Iceland 1946-59 D = 9.72 N = 3.66 |
| **5-10** | | Norway 1953-85 D = 7.06 N = 3.77 <br> Austria 1945-70 D = 5.04 N = 2.49 | Sweden 1952-68 D = 3.42 N = 3.30 | Norway 1945-49 D = 10.80 N = 3.87 <br> Germany 1957-83 D = 3.31 N = 2.56 <br> Sweden 1948 D = 5.25 N = 3.35 |
| **10-25** | Denmark 1953-68 D = 3.21 N = 4.01 | | Iceland 1959-83 D = 3.94 N = 3.84 |
| **100-150** | Denmark 1971-84 D = 2.86 N = 5.49 <br> Austria 1971-83 D = 2.00 N = 2.31 <br> Israel 1951-69 D = 2.53 N = 5.10 | Sweden 1970-85 D = 2.39 N = 3.52 | Israel 1949 D = 5.80 N = 5.40 <br> Israel 1973-84 D = 5.88 N = 4.19 |

Adjusted District Magnitude

#### Table 2. Average Effective Numbers of Elective Parties in Electoral Systems Classified by Electoral Formula and Adjusted District Magnitude, 1945–85

| Adjusted District Magnitude | LR-Hare and Pure Sainte-Laguë | LR-Droop, LR-Imperiali, Modified Sainte-Laguë, and STV-Droop | d'Hondt | Plurality and Majority | All[a] |
|---|---|---|---|---|---|
| 1–1.1 | — | — | — | 2.95 (6) | 2.95 (6) |
| 1.1–5 | — | 3.04 (1) | 3.96 (3) | — | 3.73 (4) |
| 5–10 | — | 3.19 (3) | 4.10 (6) | — | 3.80 (9) |
| 10–25 | 4.04 (2) | — | 4.27 (3) | — | 4.18 (5) |
| 100–150 | 4.30 (3) | 3.75 (2) | 4.76 (2) | — | 4.28 (7) |
| All[a] | 4.20 (5) | 3.35 (6) | 4.20 (14) | 2.95 (6) | 3.79 (31) |

Source: Based on data in Mackie and Rose 1982, 1983, 1984; Mackie 1985, 1986; Ornstein, Mann, and Malbin 1987, 47–48; and Luxembourg, Service Central de la Statistique 1984, 120–21.

Note: The numbers of cases on which the percentages are based are in parentheses.

[a]Except France of 1951–56.

proximate weights to them. Worse yet, electoral laws are themselves shaped by party systems."

Notwithstanding these cautionary words, Rae (p. 98) reports a big difference in multipartism for plurality and majority systems (which are also the single-member district systems) on the one hand and PR multimember district systems on the other—2.17 and 3.70 parties respectively. My figures show more modest differences—2.95 and 4.07 parties. The main reason why Rae finds such a small effective number of parties in plurality and majority systems appears to be that he counts in terms of elections: the 2 French Fifth Republic multiparty elections (5.56 parties) are overwhelmed by the 10 almost purely two-party U.S. elections (2.04 parties). On the other hand, if we focus on the plurality systems—Canada, New Zealand, the United Kingdom, and the United States—and exclude the French and Australian majority systems, the degree of multipartism is considerably lower—only 2.54 parties.

Since the differences in disproportionality among PR systems are smaller than those between PR and plurality-majority, we should also expect more modest differ-

ences with regard to multipartism. Rae (p. 106) reports that in accordance with his hypothesis, highest-average formulas are associated with lower multipartism than largest-remainder formulas—3.57 and 4.00 parties respectively. However, when the missing 1945–64 data and the 1965–85 data are added and the numerous misclassifications are corrected, the difference disappears—4.39 and 4.40 parties.

My own findings are hardly more impressive, however. They are summarized in Table 2. The d'Hondt systems have exactly as many parties as the most proportional LR-Hare and pure Sainte-Laguë systems (see the bottom row of the table). Also unexpectedly, the intermediate systems in terms of proportionality (LR-Droop, etc.) are considerably lower than the d'Hondt systems with regard to multipartism. We must reject the hypothesis that within the PR family, formula and multipartism are related.

The findings concerning district magnitude are somewhat more positive (see the last column of Table 2) but not as strong as Rae (p. 121) suggests. Rae reports a monotonic relationship between magnitude and the number of parties for the PR systems—from 3.18 parties in the lowest

category of magnitude to 4.65 parties in the highest, an increase of approximately 1.5 parties. My reanalysis shows a much smaller increase—only about .5 parties.

When the two independent variables are cross-tabulated, the weak relationship between magnitude and multipartism is not weakened further. The monotonic increase in multipartism as magnitude goes up is even maintained within each of the three groups of formulas, but the differences are small. Controlling for magnitude makes the influence of the electoral formula on multipartism look worse. For each magnitude class, multipartism is lower instead of higher in the intermediate category than in d'Hondt systems. And in two of the four classes of magnitude that allow a comparison of d'Hondt with LR-Hare and pure Sainte-Laguë, multipartism is higher, not lower, in the d'Hondt systems—again contrary to our expectations based on the formulas' tendencies to disproportionality.

Similar, mainly negative, evidence is provided by Figure 1, which applies the within-country test of the effect of major electoral law changes—applied earlier to changes in disproportionality—to changes in multipartism. Whereas the electoral law changes produced the expected changes in disproportionality in all nine cases, there is no commensurate pattern for multipartism: the evidence runs five to four *against* the hypothesis. Of the five changes in electoral formula, only one yields the expected change in the degree of multipartism; and of the five shifts to larger magnitudes (one case, Austria, entails a change in both formula and magnitude) three yield more, and two yield less, multipartism.

These findings suggest that the impact of disproportionality on the number of parties is even weaker than our modest expectations had led us to believe. When we take a direct look at this relationship, we find that it is in the expected direction but that the correlation coefficient is an almost negligible −.10. However, as I shall point out shortly, this negative finding needs to be qualified in several respects.

## Ballot Structure and Multipartism

With regard to the impact of ballot structure on multipartism, Rae formulates his most original hypothesis. Based on the distinction between ordinal ballots, which "allow the voter to favor more than one party with his mandate," and categorical ballots, which "require that the voter give his mandate to a single party," Rae (p. 126) hypothesizes that ordinal ballots "allow each voter's mandate to be dispersed among several parties, thereby producing a sort of microfractionalization" and that elections held with such ballots, and hence with repeated microfractionalizations, "produce more fractionalized elective party systems than would be found under other elections." However, he finds that the relationship is the other way around: his ordinal systems have an average effective number of only 2.94 parties compared with 3.23 parties in categorical systems. His conclusion is, "My theory is absolutely wrong" (p. 127).

Here again, we must take a critical look at Rae's methods and procedures. He makes two serious mistakes of classification. His ordinal ballot systems are Australia, Ireland, Luxembourg, and Switzerland. The first two use preferential ballots that allow—in the Australian case, *require*—the voters to rank-order candidates and parties according to the voters' preferences. Luxembourg and Switzerland use list PR systems but give each voter as many votes as there are seats in the district and allow the voter to distribute these votes over two or more parties, equally or preferentially. These four electoral systems are correctly classified. However, Rae misclassifies the German and French Fifth Republic systems as cate-

Table 3. Average Effective Numbers of Elective Parties Classified by
Adjusted District Magnitude and Ballot Structure, 1945-85

| Ballot Structure | Adjusted District Magnitude | | | | | |
|---|---|---|---|---|---|---|
| | 1-1.1 | 1.1-5 | 5-10 | 10-25 | 100-150 | All |
| Categorical | 2.54 (4) | 4.28 (2) | 3.99 (8) | 4.34 (4) | 4.28 (7) | 3.92 (25) |
| Ordinal | 3.78 (2) | 3.18 (2) | 4.00 (2) | 3.53 (1) | — | 3.64 (7) |
| All | 2.95 (6) | 3.73 (4) | 3.99 (10) | 4.18 (5) | 4.28 (7) | 3.85 (32) |

*Source:* Based on data in Mackie and Rose 1982, 1983, 1984; Mackie 1985, 1986; Ornstein, Mann, and Malbin 1987, 47–48; and Luxembourg, Service Central de la Statistique 1984, 120–21.

*Note:* The numbers of cases on which the percentages are based are in parentheses.

gorical; they are clearly ordinal. The French two-ballot system allows the voters to vote for different parties on the first and second ballots and quite often— when candidates are eliminated or withdraw after the first ballot—*require* that they do so. In Germany, each voter has two votes, which may be cast for different parties; this ordinal ballot system has existed since the 1953 election.[8]

When these misclassifications are corrected and also, as usual, the missing data are added and electoral systems rather than elections are used as the cases for analysis, the findings are still negative (see the last column of Table 3). The ordinal systems have less, instead of more, multipartism than categorical systems; although the differences are relatively small. In trying to explain his negative result, Rae (p. 129) speculates that "ballot structure constitutes a rather weak variable. It may be much less important than electoral formulae, district magnitude, and, more likely still, the sociopolitical forces which underlie party competition." He continues, "Unfortunately, the available data allow no definitive test of this notion, and it must be left unverified." This is an unnecessary defeatist stance, since we can test the influence of ballot structure on multipartism *while controlling for formula and magnitude.*

Table 3 shows the average effective

numbers of parties under categorical and ordinal ballots when magnitude is controlled. In the multimember district systems, my findings are still mainly negative: two of the three pairs of values still run counter to the hypothesis, and the one positive instance is only marginally positive. However, in single-member district systems, ordinal ballots result in a dramatically higher degree of multipartism than categorical ballots. The difference is roughly that between a two-and-a-half-party system and an almost-four-party-system. The explanation is not difficult to find. The categorical systems are plurality systems in which the incentive to vote strategically or insincerely, in order not to waste one's vote, is strong. This results in greater support for the large parties by voters and by politicians and a reduction in the effective number of parties. The ordinal ballot removes most of the risk of wasting one's vote; hence it encourages both sincere voting and multipartism.

When we control for the electoral formula, we find the same important difference among the plurality-majority formulas, since these coincide with the single-member district systems, and the same mainly negative result for the PR systems.[9] The link between ballot structure and multipartism applies only to single-member district systems, but it is a strong link.

## Conclusion

The two electoral system variables, formula and magnitude, have a strong effect on electoral disproportionality (considerably stronger than reported by Rae) but only a weak effect on multipartism (much weaker than Rae suggests). The reason is that disproportionality—the intervening variable between the electoral system and multipartism—is only a weak predictor of the number of parties. However, this conclusion has to be qualified in three important respects.

In the first place, the hypothesis that disproportionality should reduce multipartism is based on the assumption of strategic behavior. When smaller parties are expected to be discriminated against, voters, as well as politicians, political activists, and money givers will favor the larger parties (Gunther 1989; Riker 1986, 33–41). The finding on the effect of ballot structure suggests that the majority systems should be excluded from the hypothesized relationship. They are characterized by high disproportionality; but because of their "ordinal" ballot structure, they do not encourage strategic behavior and hence do not discourage multipartism.[10] The case of France of 1951–56 should also be excluded because its disproportionality was designed to favor the smaller parties—those in the ideological center—and therefore encouraged instead of discouraged multipartism (Campbell 1965, 113–26). For the remaining 29 cases, the coefficient of correlation between disproportionality and the effective number of parties is now −.29 (compared with an r of −.10 for all 32 cases).

The second qualification is that this somewhat stronger relationship mainly reflects the differences between the four plurality systems with high average disproportionality (11.08%) and low average multipartism (2.54 parties) on the one hand and the 25 PR systems with lower disproportionality (4.89%) and higher multipartism (4.00 parties) on the other. However, within the PR category, there is virtually no relationship between the two variables; the correlation is .02. This finding casts doubt on Sartori's (1986, 54) assertion that within the family of PR systems, a distinction must be made between highly proportional, hence "feeble," systems and less proportional "strong-feeble" systems, with the latter in an intermediate position between the "feeble" systems and "strong" plurality systems.

The third qualification is that since the focus has been on gauging the electoral system's long-range effect on the party system, multipartism has been consistently measured in terms of the effective number of *elective* parties. It is logical to expect a stronger impact of disproportionality on the effective number of *legislative* parties because the latter is affected not only by strategic responses to the expectation of discrimination against smaller parties—what Rae (pp. 67–68) calls the electoral system's "distal" effect and Maurice Duverger (1963, 226) its "psychological" effect—but also by the immediate, "proximal" (Rae) or "mechanical" (Duverger) effect of the translation of votes into seats in the particular election under observation. For the 29 cases, the correlation between disproportionality and the effective number of legislative parties is a stronger −.45. This means that disproportionality explains only about 8% of the variance in elective multipartism but about 20% of that in legislative multipartism. The latter percentage must be interpreted as the combined effect of the psychological and mechanical factors, but it still indicates that the mechanical factors are the stronger influences.[11]

To sum up, electoral systems display wide and predictable differences in disproportionality, smaller differences in multipartism that are the direct effect of disproportionality, and even smaller differences in elective multipartism due to strategic calculations by elites and voters.

Plurality systems are an exception: their high disproportionality accounts, via the effect of strategic behavior, for their relatively small effective number of elective parties. Strategic voting is neutralized in majority systems, which can therefore combine high disproportionality with high elective multipartism. And the substantial differences in disproportionality among PR systems are apparently not large enough to produce either commensurate differences in strategic behavior or, as a result, commensurate differences in elective multipartism.

## Notes

1. My references will be to the 1971 edition of Rae's book.

2. Rae was so kind as to make his original data for 1945–64 available to me, but I decided that it was preferable to use the election data in Thomas T. Mackie and Richard Rose's (1982) standard handbook in order to facilitate replication by other researchers and because I also used the latter data for the 1965–85 period. The Mackie-Rose handbook includes the elections held through 1981. For the 1982–85 elections I turned to the annual updates in the *European Journal of Political Research* by Mackie and Rose (1983, 1984) and Mackie (1985, 1986). The results of U.S. House of Representatives elections, not reported by Mackie and Rose, were taken from Ornstein, Mann, and Malbin 1987. Since the Luxembourg voting figures provided by Mackie and Rose fail to adjust for the unequal numbers of votes that voters have in different districts, I used Luxembourg, Service Central de la Statistique 1984.

3. It may be argued that compared with $I$, $D$ errs in the opposite direction: it has a slight tendency to exaggerate the *dis*proportionality of systems with many parties. However, the two-major-parties index (defined as the average vote-seat share deviation of the two largest parties), which was expressly designed to steer a middle course between $D$ and $I$, is in practice much closer to $D$ than to $I$ (Lijphart 1985, 10–12). A great advantage of $D$ compared with both $I$ and the two-major-parties index is that it does not entail arbitrary decisions either on cutoff points (for $I$, should the cutoff point be .5%, which is Rae's criterion, or should it be 1, 2, 5, or 10%?) or on the number of parties to be counted. (Instead of the two largest parties, why not the three largest parties or perhaps just the largest party?) Mackie and Rose (1982) and Rose (1984) use a slightly different form of $D$. Instead of using the "negative" index of disproportionality, they prefer to think more positively in terms of an index of *proportionality*; that is, instead of $D$, they subtract $D$ from 100%.

4. If the index of fractionalization is represented by $F$ and the effective number of parties by $N$, they are related as follows: $N = 1/(1 - F)$. The $F$ values corresponding to 2.0, 2.5, and 3.0 parties are .50, .60, and .67.

5. In Continental Europe, the Droop quota is often called the Hagenbach-Bischoff quota. Strictly speaking, there is a slight difference between the two. If $v$ stands for the total number of district votes and $m$ for the district magnitude, the Hagenbach-Bischoff quota is $v/(m + 1)$, usually rounded up, whereas the Droop quota is defined as $v/(m + 1) + 1$, rounded down if necessary (Leonard and Natkiel 1987, 3). Therefore, the two quotas differ if $v/(m + $

1) happens to be an integer; but in mass elections where $v$ is measured in thousands of votes, this difference is so tiny that it can be safely ignored. To make matters even more complicated and (unfortunately) confusing, the term *Hagenbach-Bischoff method* is sometimes also used to describe a divisor system, as in Switzerland. This method merely represents a shortcut in the application of the d'Hondt formula, and its results are exactly the same as those of d'Hondt. For all practical purposes, therefore, the two can be regarded as identical. Finally, I have to add a qualification to my description of the Imperiali quota, which is used exclusively in Italy. It has been defined as $v/(m + 2)$ since the 1958 election; but it was even lower—$v/(m + 3)$—in the 1948 and 1953 elections and, on average, slightly higher in 1946, when $v/(m + 2)$ applied to the higher-magnitude districts and $v/(m + 1)$ (in effect, the same as the Droop quota) in the smaller districts (Carstairs 1980, 157–59; Spreafico 1983, 188–90, 194).

6. In order to classify the difficult two-tier systems according to electoral formula, I distinguish between two basic types. In one type the districts at the lower level are used for the initial allocation of the seats; but the final allocation takes place at the higher level, often the national level, on the basis of all of the votes cast in all of the lower-tier districts that together make up the higher-level district. Thus, the formula at the higher level is clearly the more important one. Belgium, Denmark, Germany, and Iceland (1946–59) fit this type. (Sweden from 1970 on is another example; but since it uses the same formula at both levels, it does not represent a classification problem. This also applies to Iceland since 1959, but not to the earlier case of Iceland). The second type uses one of the varieties of largest-remainders formulas in the lower-tier districts; but instead of allocating the remaining seats to the remaining votes in these districts, all remaining votes and seats are transferred to and allocated in higher-tier districts. Here the formula at the lower level is decisive. No higher-level formula is able to favor the larger over the smaller parties systematically, since the parties with the highest totals of remaining votes are not necessarily the largest parties. Rather, the lower-tier formula determines how many seats will be available at the higher level, which is of crucial importance to the smaller parties. Only LR-Hare at the lower tier is fully proportional. Examples of the second type are Austria and Italy. Because some of these six complex-districting countries underwent changes in formula, district magnitude, or ballot structure, there are 11 additional cases of electoral systems with which the hypothesis can be tested.

7. An unintended but welcome byproduct of these adjustments is that the few erroneous magnitude values supplied by Rae no longer entail misclassifications.

8. I treat the 1953 election and the elections from 1957 on as two separate cases because they differ with regard to district magnitude.

9. In spite of these negative findings for PR systems, Rae's hypothesis still has a good deal of plausibility, and perhaps it should not be rejected completely. For instance, it seems quite clear that the small but crucially important Free Democratic party (FDP) in West Germany has benefited substantially from its appeal to the voters to give it their second votes (which are actually the more important of the two votes); the FDP has in fact been called (somewhat sarcastically) the "party of second choice" (Dittberner 1987). It is virtually certain that without the ordinal ballot, the party would not have fared so well and that multipartism would have been reduced.

10. This is especially clear in the case of the French Fifth Republic. The Australian ordinal majority system does not behave very differently from the plurality systems.

11. For the 25 PR systems (excluding France of 1951–56), the correlation between disproportionality and legislative multipartism is still only a very weak $-.17$.

# References

Balinski, Michel L., and H. Peyton Young. 1982. *Fair Representation: Meeting the Ideal of One Man, One Vote.* New Haven: Yale University Press.

Campbell, Peter. 1965. *French Electoral Systems and Elections since 1789.* Hamden, CT: Archon.

Carstairs, Andrew McLaren. 1980. *A Short History of Electoral Systems in Western Europe.* London: Allen & Unwin.

Dittberner, Jürgen. 1987. *FDP—Partei der zweiten Wahl: Ein Beitrag zur Geschichte der liberalen Partei und ihrer Funktionen im Parteiensystem der Bundesrepublik.* Opladen: Westdeutscher.

Duverger, Maurice. 1963. *Political Parties: Their Organization and Activity in the Modern State.* New York: Wiley.

Gunther, Richard. 1989. "Electoral Laws, Party Systems, and Elites: The Case of Spain." *American Political Science Review* 83:835–58.

Katz, Richard S. 1980. *A Theory of Parties and Electoral Systems.* Baltimore: Johns Hopkins University Press.

Laakso, Markku, and Rein Taagepera. 1979. "The 'Effective' Number of Parties: A Measure with Application to West Europe. *Comparative Political Studies* 12:3–27.

Leonard, Dick, and Richard Natkiel. 1987. *World Atlas of Elections: Voting Patterns in 39 Democracies.* London: Hodder & Stoughton.

Lijphart, Arend. 1985. "The Field of Electoral Systems Research: A Critical Survey." *Electoral Studies* 4:3–14.

Lijphart, Arend. 1986. "Degrees of Proportionality of Proportional Representation Formulas." In *Electoral Laws and Their Political Consequences,* ed. Bernard Grofman and Arend Lijphart. New York: Agathon.

Loosemore, John, and Victor J. Hanby. 1971. "The Theoretical Limits of Maximum Distortion: Some Analytic Expressions for Electoral Systems." *British Journal of Political Science* 1:467–77.

Luxembourg. Service Central de la Statistique. 1984. "Les élections législatives de 1945 à 1984." *Bulletin du Statec* 30:119–31.

Mackie, Thomas T. 1985. "General Elections in Western Nations during 1984." *European Journal of Political Research* 13:335–39.

Mackie, Thomas T. 1986. "General Elections in Western Nations during 1985." *European Journal of Political Research* 14:695–97.

Mackie, Thomas T., and Richard Rose. 1982. *The International Almanac of Electoral History.* 2d ed. New York: Facts on File.

Mackie, Thomas T., and Richard Rose. 1983. "General Elections in Western Nations during 1982." *European Journal of Political Research* 11:345–49.

Mackie, Thomas T., and Richard Rose. 1984." General Elections in Western Nations during 1983." *European Journal of Political Research* 12:335–42.

Nohlen, Dieter. 1978. *Wahlsysteme der Welt—Daten und Analysen: Ein Handbuch.* Munich: Piper.

Ornstein, Norman J., Thomas E. Mann, and Michael J. Malbin. 1987. *Vital Statistics on Congress, 1987–1988.* Washington: Congressional Quarterly.

Rae, Douglas W. 1971. *The Political Consequences of Electoral Laws.* 2d ed. New Haven: Yale University Press.

Riker, William H. 1986. "Duverger's Law Revisited." In *Electoral Laws and Their Political Consequences,* ed. Bernard Grofman and Arend Lijphart. New York: Agathon.

Rose, Richard. 1984. "Electoral Systems: A Question of Degree or of Principle?" In *Choosing an Electoral System: Issues and Alternatives,* ed. Arend Lijphart and Bernard Grofman. New York: Praeger.

Sartori, Giovanni. 1986. "The Influence of Electoral Systems: Faulty Laws or Faulty Methods?" In *Electoral Laws and Their Political Consequences,* ed. Bernard Grofman and Arend Lijphart. New York: Agathon.

Spreafico, Alberto. 1983. "Systèmes électoraux et système politique en Italie depuis 1945." In *Les modes de scrutin des dix-huit pays libres de l'Europe occidentale—leurs résultats et leurs effets comparés: Élections nationales et européenes,* ed. Jacques Cadart. Paris: Presses Universitaires de France.

Taagepera, Rein, and Bernard Grofman. 1985. "Rethinking Duverger's Law: Predicting the Effective Number of Parties in Plurality and PR Systems—Parties Minus Issues Equals One." *European Journal of Political Research* 13:341–52.

Taagepera, Rein, and Matthew S. Shugart. 1989. *Seats and Votes: The Effects and Determinants of Electoral Systems.* New Haven: Yale University Press.

Van den Bergh, G. 1955. *Unity in Diversity: A Systematic Critical Analysis of All Electoral Systems.* London: Batsford.

Arend Lijphart is Professor of Political Science, University of California San Diego, La Jolla, CA 92093.