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SURVEY RESEARCH AND THE DECODING OF PATTERNS IN ECOLOGICAL DATA

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Accidents of training, the swing of career lines, differential accessibility of research materials and special capabilities of research institutes all often combine to produce the impression that the world of empirical social research is divided into two camps: the survey research specialists and the aggregate data specialists. And in the measure such specialization does exist, it is naturally a social imperative that the two camps be at intellectual war with one another!

Whatever grounds this observation may have had in the past, it now seems grossly inaccurate, if not downright amusing. Day-to-day specialization on one side or the other does exist, as a practical matter. At the same time it is self-evident to serious investigators of both breeds that neither data source taken alone is entirely satisfying. There are many exciting questions to be approached through aggregate data that can be confronted ineffectively if at all with survey materials. And conversely, there are questions deftly answered by survey information that aggregated data comment upon only after a frightening series of inferential leaps, or leave as a nest of complete indeterminacy. Thus between them, the two types of data open up to us an extent of ground that neither taken alone would permit us to cover.

A far larger and more fascinating domain of problems, however, lies at the intersection of the two data bases: classes of inquiry that can best be pursued with joint or complementary use of aggregate and survey materials. Certainly such a tactic is necessary if we are to put to the test many of the things we have told ourselves over the years about the crucial theoretical significance of the interaction between the individual and his social microcosm on the one hand, and broad systemic conditions on the other. Work of this sort is well represented at this symposium. Yet this obvious example scarcely exhausts the types of investigations that may profit handsomely from joint exploitation of these data bases.

Another of these types of inquiry, and one that concerns us primarily here, attempts to work from the complementary strengths of both types of data to circumvent their respective weaknesses. One of the prime attractions of aggregate data is their richness in national variety and historical depth. Such scope gives analytic entree into a range of systemic conditions--historical junctures, cultural and developmental differences--that survey data obviously cannot now match. A prime weakness of ecological materials lies in their aggregated, summary nature and the intrinsic ambiguities that spring from this fact. For any pattern of aggregate variation taken alone, it is typical that a number of plausible "models" of the underlying process that generated it can be imagined, and the aggregate information as traditionally treated provides little apparent leverage for a more satisfying diagnosis.

However, a close understanding of what we might call the "infrastructure" of the competing explanations through analyses of survey data even from a different time or place often serves to suggest further critical tests on the aggregate materials that may help to sort out which process is the more plausible generator of the aggregate patterns. Sometimes survey materials will suggest ancillary or modifying variables that need to be brought to bear on the aggregate patterns. Sometimes understanding of the pattern in its disaggregated form suggests more incisive ways of organizing the aggregate data from a statistical point of view, to sharpen or purify the aggregate effects if indeed they have been generated in one way rather than another. In the most elegant cases, one may have a model or simulation of the suspected processes at an individual level. If such a model can faithfully reproduce the known survey effects while generating comparable gross aggregate patterns, one's power to decode the meaning of earlier aggregate materials is greatly enhanced. In some instances we may find that parameters important for the process as understood for the current period are known to have been quite different a century earlier (urbanization, education, population age structure, communication processes). Then with a satisfactory model, it is an easy thing to reset the appropriate parameters and discover whether the model can indeed reproduce the historical aggregate information.

Of course such work can provide feedback in its turn to the design of survey instruments, specifications for critical data, suggestions for new analytic departures, and the like. Between the two data bases lies a two-way street, and we all shall profit from heavy traffic on it. It might be useful here to spend our time attempting to classify the kinds of traffic that could pass at various stages of an inquiry. I am more inclined to leave this a free matter, and attempt instead to focus upon a concrete example of an analysis that has actually been carried out and has substantive interest of its own, while illustrating in transit the utility of information from sample survey work in the more intensive examination of historical aggregate data.

Indeed, I had originally chosen a subject for just such an illustrative analysis, to be based on the store of aggregate historical voting statistics which is accumulating at a rapid pace in the archives of the Inter-University Consortium for Political Research, based in Ann Arbor, Michigan. However, as time passed it became clear that the materials I had expected to use would not be in manipulable format in time for this paper. Therefore, I have been obliged to use sketchier data than originally hoped, although I think they suffice perfectly well to suggest the logic of the operations conducted, and to illustrate the interpretive role of survey research in such aggregate explorations. More important, just as analytic work with these data began, I received a copy of Professor MacRae's paper for this same symposium, and discovered that the problem I had decided to pursue--the use of sample survey insights to detect the occurrence and magnitude of critical elections in earlier American voting statistics--had already been tracked down with consummate skill.[1]

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[1]Duncan MacRae, Jr., "Factor Analysis of Aggregate Voting Statistics," a paper prepared for the Symposium on Quantitative Ecological Analysis in the Social Sciences, Evian, France, September 1966.

The latter problem could be transformed into an asset rather than a liability, since the MacRae paper could itself be used to exemplify the value of sample survey data in "decoding" patterns in historical aggregative material. Therefore, I shall first lay out briefly the primary model of the voting process which underlies the problem Professor MacRae has analyzed. I shall try in passing to point out the ways in which survey insights were helpful not only in motivating his inquiry, but also in providing guidance along the way as to the most effective ways of organizing the aggregate materials in order to make them yield up their story in most reliable and incisive form.

Then I shall proceed to develop from the same underlying model a quite different line of inquiry, although one which remains something of a logical companion-piece for the MacRae paper. This analysis will be pursued with the aid of illustrative aggregate data from the United States and France.

THE BASIC VOTING MODEL

Although survey research material on voting has been crucial in fleshing out the basic model we are employing here, some of the initial insights were emphasized by keen students of aggregate voting statistics. Most notably, V. O. Key became fascinated with the fact that voting returns over long periods of time tended to show long periods of relative stability, punctuated at rather rare intervals by large-scale shifts in fundamental political coloration of voting districts. This was neither a trivial nor self-evident observation. The neophyte examining aggregate voting records over long periods of time might well not have noticed the fact, for after all, such tabulations present quite a formidable sea of change. No election is quite like any other election, even for the same district, and the party division of the vote is always shifting this way and that from election to election. What attracted Key's attention was the fact that although temporal variation in vote outcomes was ubiquitous across districts, such variation tended to have a rather clear center of gravity for any particular district; and short-term swings in actual election returns could be seen as oscillations around this center of gravity. In other words, if a district seemed to cast most of its votes in the 40-45 percent Democratic range over a period of time, and then in a given election swung toward an unusual 55 percent Democratic, it was far more likely to swing back toward the 40-45 percent range in any subsequent election than it was to evolve onward into the 60 percent Democratic range, or even to remain at 55 percent. Upon occasion, however, the center of gravity of a voting series for a district did appear to undergo a step change, with new oscillations beginning around the new level of partisanship. And most important, such step changes were not haphazardly distributed in time for districts, but rather tended to occur for a large number of districts in the same election, and then did not occur again for a considerable period of time. As we have seen, Key labelled these elections "critical elections," and commented upon their occurrence in American history.[2]

At the same time, survey research data were demonstrating that voters often made significant distinctions between the party for which they had voted in a particular election, and the party to which they felt a more abiding allegiance. Thus, for example, in 1952 General Eisenhower won the first substantial Republican majority for president that the nation had seen in 24 years; and political pundits began to write books prophecying a new era of Republican ascendance. Yet survey data from that year showed that the Eisenhower victory was not due to masses of new recruits to the Republican faith, but rather to solid backing from traditional Republicans and large rates of defection on the part of citizens who told interviewers they continued to think of themselves as Democrats. It is no secret of course that these more basic expressions of loyalty turned out to be far more important as long-run predictors of voting decisions in the middle and late 1950's than the short-run flirtations with the Republicans.

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[2]V. O. Key, Jr., "A Theory of Critical Elections," Journal of Politics, 17 (1955), pp. 1-18.

Of course the isomorphism between Key's observations about properties of voting trends and this kind of survey informations was immediately clear. The short-term oscillations in voting series could be attributed to transient defections, recognized as such psychologically by the actors involved; and the center of gravity of such returns from a particular district would tend to represent the basic division of party loyalties elicited by survey measurements of "party identification." The stability of these identifications for individuals over time was to be heavily documented in survey studies in ensuing years. And "critical" or "realigning" elections (although none had been available for close study since survey research techniques had developed) would be ones in which voters not only crossed party lines in the sense of a short-term defection, but underwent full-fledged conversion of loyalties as well.[3]

Since the time when these notions came into focus, more intensive work with sample survey materials has proceeded on all the fronts the underlying model suggested. Factors governing the development and intensification of party loyalties were explored. Conditions facilitating or impeding short-term defections began to be systematized. Data collections associated with each election permitted a far more exact and direct measurement of the short-term forces producing defections in varying specific election races at different levels of office.[4]

Virtually all of this accumulating information can fruitfully be plowed back into a re-examination of American voting statistics from earlier eras for which no survey data are available. Perhaps the simplest and broadest lesson from the model is the fact that what registers as change in aggregate voting statistics--the swing of a vote division in a district from one election to another--can be of two radically different kinds: the short-term defection under the allure or repulsion of immediate stimuli, as against more fundamental, long-range conversion. Furthermore, the fact that most electoral change is of the former, rather than the latter kind in the United States, has some critical implications for any interpretation of voting change in briefer periods. Historians attempting to understand the motivations prompting the electorate or portions of it in an election t_2 have long compared t_2 outcomes with the state of affairs at t_1, or the previous election, and supposed that an analysis of these changes and their social correlated would provide the nearest possible approach to an accounting of the dynamic forces driving voters in one party direction or another at the t_2 election. Yet one implication of the model, once it is clear as an actuarial fact that in the United States defection rather than conversion accounts for the vast bulk of electoral change, is that something approaching half of the change in vote proportions from one election to the next needs to be conceptualized not as the product of dynamic new short-term forces associated with the t_2 election, but rather as the effect of a relaxation

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[3] A. Campbell, P. Converse, W. Miller, and D. Stokes, The American Voter. New York: Wiley, 1960. See especially Chapter 19.

[4] Stokes, Donald E., "Some Dynamic Elements of Contests for the Presidency," American Political Science Review, March 1966, 60 (1) 19-28

of short-term forces which were new and dynamic at t_1. As an example, it can be shown that Protestants in the United States moved away from the Republican Party and toward the Democrats more vigorously than did Catholics at the time of the 1964 election (where the baseline is the previous election). Should we interpret these aggregate patterns as telling us something of an unexpected set of short-term forces related to religious differences in the Goldwater-Johnson contest? No, of course not: these patterns have nothing to do with the election situation in 1964 per se, but rather reflect the inevitable outcome given the relaxation of the forces peculiar to the 1960 election.

The model itself suggest a proliferating array of problems to be attacked with aggregate statistics, while lending guidance as to how those statistics should be treated statistically and ultimately interpreted. The MacRae paper involves a whole network of decisions about the organization of the data which such a model prompts. The averaging of time series to provide a stable baseline; the introduction of an extremely minor office to minimize the error or "noise" in certain estimates that the large-scale defections associated with well-known candidate personalities can produce; the extraction at a point of the "traditional" component of the vote, in order to purify the variance being examined with respect to the immediate purposes of the inquiry: these and other steps reflect a thoughtful wedding between such a model and the gross variation in the aggregate statistics in their raw form. Indeed, the components of the vote are rendered explicit in item 6 of the "Basic Assumptions of the Method" section (p. 7).[5]

Although clarification of the basic notions has already been an important contribution of survey research to the decoding of aggregate statistics, the contribution even on this specific set of points is continuing. Thus, for example, we are hoping that further work can improve on the methods for isolating the traditional component or political center of gravity of a district from variation due to short-term forces. It is clear that averaging a set of outcomes across several elections provides a much better estimate of the traditional component than would the results of any election taken alone. However, in terms of the model, the adequacy of this estimate hinges on the assumption that in any moderate run of time a district will have experienced a fairly balanced mix of pro-Republican and pro-Democratic short-term forces. This is demonstrably untrue in the recent period for which survey data are available. If, for example, one were to compute a center of gravity for various districts on the basis of their vote returns for the past four presidential elections in the United States, the estimates might be reasonably good for a minority of heavily Catholic districts, since roughly speaking these districts have been subjected to two strong Democratic swings and two strong Republican ones. In strongly Protestant districts however, such an average would suffer a substantial known bias, since these districts have responded to three strong Republican swings and a single Democratic one. Attempting to improve the estimate by extending the time series and

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[5] Duncan MacRae, Jr., op. cit.

enlarging the sample of elections is not a reassuring solution, since the longer the time base the more severe the deception of population movement into and out of the district can become. In fact, even the twelve-year base our example assumes here would be treacherously long for some areas in the United States.[6]

Therefore we are currently involved in experimental work with survey and aggregate data from the 1950's, testing ways of working backward from aggregate returns to arrive at less biased estimates of the traditional component, based on even shorter segments of time, than any averaging method can produce. We naturally are attempting to proceed in a fashion which, although jointly confirmed by survey and aggregate data in the current period, could be extended back to periods for which the survey "crutch" becomes unavailable.[7]

The number of fascinating theoretical problems which can be handled in a much more meaningful fashion once the capacity to isolate short-term and traditional components from aggregate voting series is refined, seems rather long. One brief example which may be of interest outside the American polity has to do with the progressive "deregionalization" or "nationalization" of electoral responses which is as apparent to even a cursory inspection of American historical statistics as it is in the voting statistics of many other nations over roughly the same period. There are obvious statistical tools for mapping out these trends over time in precise ways, and such a mapping, laid against other extant information on the development of mass national communication systems, could provide important information on the progressive integration of national polities in the modern period. However, in just such a problem as this, it would be of tremendous interest to treat election returns over the past century resolved into their two main components, for it is likely that the deregionalization of the short-term component, for self-evident reasons, has been leading the erosion of regionalism in the traditional component by 50-80 years. A mapping of these properties of the raw vote materials, without the components isolated, would give an "averaged" trend that would be thoroughly misleading.

VARIANCE PROPERTIES OF AGGREGATE VOTING SERIES

The MacRae paper focuses its attention on that portion of the model which involves the mean or central tendency of a series of votes over time, looking for those infrequent points at which this central tendency shifted significantly. If the central tendency is one important

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[6]One-third or more of the 1964 electorate in Florida had migrated into that state since 1952, and the partisanship of the immigrants departs widely from that of the native population.

[7]See "The Concept of a Normal Vote," Chapter 2 of A. Campbell, P. E. Converse, W. E. Miller and D. E. Stokes, Elections and the Political Order, New York: John Wiley, 1966.

property of a sequence of votes, its variance is another.

We have already spoken of short-term oscillations of a vote series around a (temporarily) fixed mean. It is clear conceptually that these oscillations might have quite different amplitudes for different populations, even though both populations were responding in the same general direction at the same time to the same set of short-term forces. In the American case, one population might swing two percent to the Republican side in one election, and then four percent to the Democratic side in the next; while another population might show a swing of seven percent Republican followed by a swing of 13 percent Democratic in the same sequence of elections. If these differences in behavior persisted over any length of time, we might suspect that there were systematic reasons: that one population is for whatever reasons relatively unstable, responsive or flexible; while the other is stable or rigid, the choice among adjectives depending primarily on how we may feel about the matter.

From many points of view, the variance property of the series is of fully as great political significance as its central tendency. In the American system in the current period, for example, the central tendency of public preference favors the Democratic Party by several percent, as it has for at least two decades and probably longer. The Democrats are in the majority, the Republicans suffer minority status. This does not mean that Republicans have no hope of capturing the important nationwide office of the presidency from time to time: the system is a reasonably unstable or responsive one, and defections on a large scale are sufficiently plausible that given favorable short-term forces the Republican Party can manage a national majority. This responsiveness does not dim the significance of the fact that the Democrats enjoy the majority, for that majority gives them a running start toward victory, and assures that they can capture the White House not only with neutral or favorable short-term forces, but even with mildly unfavorable short-term forces as well (as was the case in 1960). Nonetheless, the fact of an underlying 54-46 majority has only limited significance, as Stokes has pointed out, unless we add some further information concerning the variance property of the voting system at the same time. That is, if the expected standard deviation of the vote were as large as 20 percent, the minority party would only face 42-58 odds in any given election; whereas laboring under the same shortage of loyalists, its chances of victory would shrink to less than 3 in 100--a rigid one-party state--were the expected standard deviation as small as two percent. Thus the most important meaning of a basic majority is a joint function of the displacement of the mean from 50-50 and the variance of voter performance across a sample of elections.[8]

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[8]See Donald E. Stokes, "Party Loyalty and the Likelihood of Deviating Elections," in A. Campbell, P. Converse, W. Miller and D. Stokes, Elections and the Political Order, New York: John Wiley & Sons, 1966. Working from the variance shown by the American presidential vote over the past 65 or 70 years, Stokes estimated the probability of a Republican presidential victory given a 54 percent Democratic majority to be about .27. One assumes that the similarity between this figure and the proportion of administrations that the Republicans have indeed captured since the Democratic majority was forged at the time of the Great Depression--two administrations out of nine--is far from accidental.

Although the evidence is far more fragmentary, there is at least some reason to imagine that a high-variance voting population would be more susceptible, given a certain degree of crisis, to approaches from ad hoc parties mushrooming outside the traditional party system, than would low-variance voting populations under the same objective pressures. In other words, a low-variance population seems more firmly anchored in the ongoing party competition than does a high-variance population. And it may well be that the notion of such a variance property is more readily transferred from the simplistic terms of the American two-party system to other multi-party polities than are questions of the central tendency of the vote and its relationship to the magic 50-50 watershed.

An interest in the variance property implicit in the model leads quite naturally to a consideration of differences in expressions of strength of party identification in sample survey work. In other words, we should certainly expect a population of adults indicating that they are strongly identified with one or another party to show a vote record over time with a lower variance in its party division than a population of adults who only felt vague "leanings" toward a party at the starting point. Furthermore, there is reason to believe that there are significant differences in the overall level of allegiances between nations at any point in time; for the same nation at different points in time; and across certain predictable subpopulations of a given nation at any time. One of the fairly reliable findings in the latter category is that the strength of party allegiances grows with participation in the system; and for most mature systems, an elderly cohort of voters is likely to express much less equivocal allegiances to existing parties than does a cohort of younger voters. Working from sample survey information concerning these differential strengths of identification by age, and the differential responses to the same short-term forces by strength of identification, we have simulated the behavior of a new cohort of American voters (ages 21-24) and an elderly cohort (over 70), bombarded by the same samples of short-term forces over a sequence of voting "trials."[9] The variance of the vote performances of the young is substantially greater than that of the oldest cohort.

The obvious conceptual relationship between strength of party identification as it might be observed directly in sample surveys, and the variance properties of aggregate voting series opens the possibility that aggregate materials might be used to generate inferences concerning the underlying stability of partisan loyalties in historical populations for which survey data are not available, and hence to permit the reconstruction of the rates at which large-scale populations are socialized into new party systems. This is indeed the interest which we shall pursue in our pilot analysis below. However, it should be emphasized at the outset that enough is known of these matters not to expect any simple, one-to-one

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[9]The model bears some similarity to that discussed by McPhee in Chapter 5 of William N. McPhee, William A. Glaser, Public Opinion and Congressional Elections. Glencoe, Ill.: The Free Press, 1962.

correspondence between the variance of a voting record over time and underlying strengths of partisanship. A correlation can indeed be expected, and ceteris paribus, a full correspondence. Yet we are already aware that a number of other conditions (some of which, like the rate of turnover of candidates presented to the public, represent "external conditions" and say little about the dispositions of the voter himself) can powerfully affect the variance of a voting record apart from the strength of identification of the voters, so that convincing detective work must await much more ambitious analytic efforts than we can bring to bear at this time.

Nevertheless, there is a sufficiently large number of questions abroad having to do with the stability of partisanship of differing populations, that it seems worth presenting a pilot analysis here.

LONG-TERM PARTISAN STABILITY: FRANCE AND THE UNITED STATES

One of these interesting questions has been on our collective agenda since the publication, in 1913, of Andre Siegfried's classic study of political behavior in the fourteen "western" departments of France.[10] While this rich work retains interest today in many substantive directions, one residue that the volume leaves in scholarly minds has to do with the remarkable stability of partisan tendencies over long periods of time on a geographic base in France.

This residual impression might be thought to stand somewhat at sixes and sevens with more recent work of both survey and aggregate types of French voting, which tend to comment on partisan instability and low levels of French identification to the major traditional parties. R.D. Masters has attempted a comparative investigation of stability of aggregate voting statistics in France, the United States and Switzerland over the period from 1919-1958, and his index of mobility of the vote shows far higher values for France over this period than for either of the other two countries.[11] This impression of relative instability fits with deductions drawn from some treatments of sample survey data from post-war France.[12]

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[10] Andre Siegfried, Tableau Politique de la France de l'Ouest sous la Troisieme Republique. Paris: Armand Colin, 1913.

[11] R.D. Masters, "Une Methode pour Mesurer la Mobilite des Attitudes Politiques," Revue Francaise de Science Politique, Vol. X, No. 3, September, 1960, p.658.

[12] P.E. Converse and G. Dupeux, "Politicization of the Electorate in France and the United States," Public Opinion Quarterly, 26, No. 1 (Spring, 1962), p. 1. MacRae elsewhere argues from post-war French survey data that interchanges of support between at least the stable traditional parties has been less than comparable movement in the United States. See Duncan MacRae, Jr., The Fourth French Republic, (in press: New York: St. Martin's Press, 1967).

None of this newer work clashes with the Siegfried observations in an necessary way. Siegfried was dealing primarily with voting returns for the early years of the Third Republic, and it might easily be claimed that the trauma of two successive wars had served to shatter any bases of partisan stability that might have pertained in an earlier epoch. On the other hand, it might be argued instead that Siegfried's amazement at the stability of voting lines was mainly attributable to the expectations he had brought to the data: had he sat down for an intensive analysis of voting statistics from some other countries rather than France, his amazement might have been even greater.

There are other senses, too, in which the Masters article does not attempt to confront the Siegfried thesis. Masters operated on the grossest of all possible aggregate data: vote divisions summarized at the national level only, for each of the major elections during the period of interest in each of the three nations. The "index of mobility" is a simple first-order difference between the proportion of total national votes a party received in one election (e_1) and in the next election of the same type (e_2). Such absolute differences are summed across parties to produce a total that describes overall mobility across the pair of elections in question.

While such first differences are indeed one of the most legitimate and accessible ways of expressing what we would call the short-term variability of the vote, in this comparative context they raise a number of methodological questions, while more or less escaping the main thrust of Siegfried's contentions. It is apparent in the first instance that the operation of summing differences across parties may have a radically different meaning in a system where ten or more party groupings can contribute to the total index for an election than for a system where only two or three do.[13] Secondly, the restriction of the data to national-level totals bypasses the issue of internal geographic differentiation and its relative stability or instability. It would be possible, for example,

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[13] It should be noted that this problem does not wreak havoc with the broad conclusions Masters draws, given the particular data presented. His index, averaged across elections, shows values of 39.0 for France and 16.2 for Switzerland, despite the fact that the number of parties contributing differences to each election total is about the same in the Swiss as in the French case. If one computes a per-party contribution to the index--the strongest correction one could conceivably require, and on several conceptual grounds <u>too</u> strong--then the index for the United States registers higher mobility than that shown for the French data in the major data display. However, in this instance non-voting is treated as a contribution to the index, and the large and regular fluctuations in turnout from presidential to off-year congressional elections in the United States add mightily to the magnitude of its mobility value, as Masters points out. Removing this effect by considering only the series of congressional votes cast in presidential elections reduces per-party United States value to about 3/4 the magnitude of the comparable French figure. (The per-party value for Switzerland remains much lower than either.) See Masters, <u>op. cit</u>., pp. 660-665.

for national totals to jump around quite wildly, with all component regions hewing to their same relative positions in the left-right spectrum.[14] This would be a type of instability, but one which would suggest potent underlying loyalties, combined with a certain freedom of short-term defection in a polity whose responses were relatively "nationalized." Thirdly, the Masters treatment is bound to the identity of specific parties over time, rather than to the broad tendances or competing ideologies which successions of specific parties may represent over any long run in a sufficiently multi-party system. The Siegfried work is quite unequivocal on this point: the author was impressed by the proliferation of specific "etiquettes" that stood for election in the period and area which he studied, and the "astonishing stability" to which he refers is not that of the nominal party, but rather that of the underlying ideological predilection, whatever party names and short-term leaderships might float to the surface in various periods. And finally, the primary measure used by Masters, dependent on the change between two successive elections, is addressed to change in the most short-term sense (defections) and would tend to construe any phenomenon of a "return home" to one's basic party after a given defection as added proof of instability.[15]

These remarks should not be taken as a critique of Masters, particularly as it is we who have introduced Siegfried into the discussion, and not Masters himself. What we wish to emphasize more than anything else is that terms like "change" and "instability" can have quite different referents and hence diagnostic operations for their discovery in aggregate statistics. It is our argument that models refined in survey analysis can be of great help in clarifying such distinctive referents.

We have already suggested that short-term variability of the kind that Masters taps in at least a gross, national-level sense, is a symptom of weakness in underlying party identifications at an individual level. However, we would like to approach the problem from another angle, one which minimizes the influence of short-term variation in favor of long-term variation, and in several other senses fits the Siegfried perspective better as well.

Our procedure has in some ways been affected by the nature of the data readily available, and we might have handled the problem somewhat differently had we been able to start from more nearly raw voting statistics. The information on hand was contained in Goguel's Geographie des

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[14]This is the property of American aggregate voting statistics which intrigued Louis Bean in his volume How to Predict Elections. New York: A. A. Knopf, 1948.

[15]One exception to this observation is the display of what Masters calls an index of cumulative mobility: the amount of change between the first election in the series and each successive election thereafter. It is with respect to this index that the French materials depart most radically from the Swiss and American in their suggestion of long-term as well as short-term instability. This index most closely approximates the manipulations of the data we shall use below, although it tends to require a "representativeness" of the first election in a series in a way which is unnecessary. Masters, op. cit., pp. 668-670.

Elections Francaises, which presents in map form selected results from major French elections from 1870 to 1951, thereby sweeping back across most of the period covered by Masters and the period studied by Siegfried as well.[16] Because of the presentation in maps with eight or ten tinting gradations, the original metric information is destroyed, and the departments of the nation are in effect collapsed into ranks with multiple ties, with respect to whatever voting variable may be at issue in the particular map.[17]

Moreover, there is a fair amount of "missing data," in that maps treating the same party or tendance are not provided for every major election, although there appears to be at least one map for every election. Finally, there is something of an "apples-and-oranges" problem, since the variable coded on some of the maps does not have to do with the proportion of popular votes captured by a party or tendance, but rather with the proportion of representatives elected for service in the Chamber of Deputies who were associated with the party or tendance in question.

On the other hand, as long as we make some effort to keep track of our apples and oranges, the data lend themselves to examination of Siegfried's thesis better than some might, for reasons in addition to the geographic base and the time depth. Despite the fact that in some instances, for some time periods, the data involve specific parties such as the Communists and the Socialists, the main maps from which our materials are drawn involve broader subjective codings of underlying tendance, whatever specific parties may have represented the tendance in the period. The most continuous data, and hence those which we shall use most heavily, are presented for the Right and for the Extreme Left.

The parallel materials prepared for the United States are considerably more straightforward. The division of the popular vote between the major parties at the state level over the sequence of quadrennial presidential elections from 1872 to 1960 formed the initial batch of data. These quantities were then collapsed into intervals or ranks, yielding distributions approximating those emerging from the French data as closely as possible.

In both cases, an intercorrelation matrix was formed, organized

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[16] Francois Goguel, Geographie des Elections Francaises de 1870 a 1951, Cahiers de la Fondation Nationale des Sciences Politiques No. 27. Paris: Armand Colin, 1951.

[17] This collapsing has at least one beneficial side effect for our purposes. In view of the fact that the size of the intervals coded and the median rank were adjusted to leave something of a rectangular distribution, a primitive "normalization" has already been carried out which diminishes concern one might otherwise have about the differential effects of uniform class intervals on returns for large and small parties.

sequentially by election dates.[18] The United States matrix, being a pure and homogeneous one, was subsequently operated on in its initial form. The French matrix, involving quite a crossing of apples and oranges (different parties, and measures of votes as opposed to proportions of seats) was largely discarded, with five more sparse submatrices being selected from it. These involved time correlations, over irregular lapses of time, between (1) proportion of seats for "La Droite"; (2) proportion of votes for "La Droite"; (3) proportion of seats for the Extreme Left; (4) proportion of votes for the Extreme Left; and (5) proportion of votes for the Communist Party. Within each of these five matrices, the entries were pure, in the sense of representing the same entity correlated with itself at another point in time.

These matrices resemble some that were involved in the MacRae paper; yet as we want to ask quite a different set of questions of them, we shall treat them in a radically different way.[19] For simplicity's sake, we shall proceed with the major part of the discussion referring to the more proper United States matrix (or any one like it), and postponemention of the additional wrinkles the French matrices imposed on us. We may think of this matrix as representing a surface which has contours into the third dimension, according to the relative sizes of the coefficients in different regions of the matrix. Given the kind of matrix we are dealing with here--organized by progressively-larger time leaps--we would not be in much doubt as to what kind of surface in general we are likely to find. That is, we have the intuitive sense that many forces act over time to decay structured relationships progressively; and the longer the time that such forces operate, the greater the decay to be observed from any given temporal starting point. In other words, we would surely expect such an intercorrelation matrix to show the "simplex" form; i.e., a pitch like a roof, with the ridge running just off the main diagonal (the correlations between successive elections), sloping off progressively to a low point at the far corner of the matrix,

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[18] Given the destruction of metric information, the correlation coefficients employed were tau-beta rank order coefficients. The bivariate distributions underlying the coefficients are of a sort that gamma coefficients (also generated by the computer program, but not used) depart only slightly from the tau-betas and in perfectly predictable ways, so that the general conclusions formed would differ in no particulars whatever had the gammas been used instead. As will be noted subsequently, some of the analytic machinery brought to bear presupposes Pearson correlation coefficients as a substrate, and with more adequate metric information available the product-moment coefficients would have been used. Once again, however, the correspondences between Pearson coefficients and the rank-order coefficients used are sufficiently straightforward for information of this kind that there need be little concern that the main comparative results are artifacts of the choice of coefficient.

[19] Factor analysis would be a reasonable alternative at a point or two in the following inquiry, but we have refrained from using it in view of our interest in keeping some of the intermediate data organization explicit.

where the correlations relate the most distant time points.[20] What is interesting to us is not the fact of the slope itself, which is nearly trivial, but the possibility of investigating the properties of the slope to arrive at more precise expressions concerning the rate of decay and its general form.

One simple way of proceeding is to consider all correlations in any given diagonal of the triangular matrix as repeated estimates of an underlying "true" value, representing the correlation between states for the particular lapse in time represented by that diagonal. In this light, it is a natural impulse to average these successive estimates in order to arrive at the best cross-sectional "slicing" of the roof, summarizing the general contour of the slope represented.[21] The number of estimates we have for each new diagonal diminishes progressively by one as we move outward from the main diagonal, so that our averages become less and less stable. However, with a matrix as large as that for the United States, we can cover time lapses as great as 70 years without falling below five estimates.

Such a single decay function, based on a diagonally averaged matrix and plotted as a function of the appropriate amounts of elapsed time, takes on additional interest when we recognize that comparable decay functions under various theoretically-interesting limiting cases can be computed, and laid against whatever our empirical materials generate. One such theoretical function can serve us as a kind of null model. This is the case in which information about the state of affairs at time (t) by itself is our best predictor of the state of affairs at time (t+1), and cannot be improved upon by importing information from (t-1), (t-2) or any other earlier states. In the vocabulary of Markov chains, the null model is that which fits the assumptions of a first-order chain. In correlation vocabulary, the null model is that in which a) all correlations between successive time points ($r_{t,t+1}$) have the same value; and b) all partials of the form $r_{1k\cdot 2,3\ldots(k-1)}$ can be said to vanish. This is a condition dear to the hearts of causal modellers, and says in effect that whatever effects are transmitted across time from the first measurement to the $\underline{k}^{th}$ measurement are transmitted completely through the intervening measured states. With all of these

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[20] More properly, perhaps, I should say these would be our expectations where the voting data are concerned. In some instances one would find matrices looking much more like a Chinese roof than a Western one, with (for example) the t_1- t_5 correlations generally greater than those for t_1- t_3 or t_1- t_4, and those for t_1- t_{10} generally greater than others intervening in time, all of which is a simple indicator of an underlying cyclical process.

[21] The single function generated is formally very similar to the correlogram used by economists in connection with auto-correlation of time series data. See Maurice G. Kendall, The Advanced Theory of Statistics, Vol. II. London: Charles Griffin, 1948, Chapter 30.

partials set to zero by assumption, then the correlation for any time lapse t_1 to t_k is readily computed as

$$r_{1k} = (r_{12})^k$$

and the appropriate decay function for the null model plotted.

Now this null model does not in itself represent anything we would want to call a stable or an unstable process, without further information. In particular, we would want to know the value of r_{12} governing the function in whatever special case we are treating. I would assume that if r_{12} were very large, such as .95, we would consider the process much more stable than we would if the value r_{12} were found to be only .05, although of course decay functions could be plotted for either of these cases.

However, the presence of background or higher-order partials, which our null model rules out, would suggest a further dimension or dimensions of stability not apparent in the single parameter, r_{12}. And, of course, the presence of such partials can rather radically alter the form of the decay function, progressively retarding it as they increase in magnitude. Indeed, for any r_{12} there exists a first partial $r_{13 \cdot 2}$ of what seems intuitively to be a remarkably modest size (i.e., the range .30-.47, for r_{12}'s from .50-.90), which is sufficiently large to render the decay function a horizontal line, or independent of the elapsed time.

What would some non-zero partial mean substantively in the case of voting data correlated over time? The aggregated nature of the data, as usual, introduce some further ambiguities we must subsequently examine. However, let us suppose we are correlating successive votes over time for individuals in a system which operates along the lines suggested by our original model. That is, it is a system in which various short-term forces induce quite visible rates of defection in any given voting trial, although most participants have some underlying preference for one of the two parties. Thus while an individual may readily defect in one election, and at considerably lower odds repeat his defection in a second election and still more rarely a third, there will remain a very strong "homing" tendency even when defection does occur. The correlation between any pair of successive elections will be reduced by the relatively "noisy" or largely uncorrelated defection phenomenon, but given additional elections, the underlying party fidelity will be manifested in the fact that r_{13} is greater than $(r_{12})^2$, which is another way of saying that there exists some non-zero partial $r_{13 \cdot 2}$, and the magnitude of that latter partial could be construed as some positive function of the strength and prevalence of the underlying trend toward continuity or stability, relative to the stability already manifest in r_{12}. Where the partial is actually zero, on the other hand, it would suggest the absence of any of the systematic "homing" tendency that is the essential feature of the defection phenomenon and the consequence of underlying party loyalties. That is, for a system of multiple parties ordered A through F, the absence of the partial indicates that if a voter has shifted his support from party C to party D over two elections, there is no unusual probability that he will return to party C in a third election, relative to the probabilities of remaining at D or passing on to E or F.

The existence of positive second-, third- and higher-order partials in addition to the first partial would suggest that some systematic traces of "homing" tendencies may take two or even more elections to assert themselves. However, we would of course expect magnitudes to decline progressively as one moves to increasingly high orders of partials.

Now that we have considered some of the implications of these decay functions, let us turn to the data. In Figure 1 we have graphed the empirical functions generated by the United States and French matrices, and laid alongside these the decay function that would be associated with a comparable process in the null (zero-partial) case. It is apparent that both batches of data yield observations which are very well-behaved, showing the expected decay form and clustering quite well along their respective functions. Most noteworthy is the fact that the two batches of data, while sharing a very similar r_{12} initial point, diverge completely and cleanly: there is certainly no problem of discrimination between them.

The French function departs systematically from the null model, with the rate of decay unquestionably being impeded by the existence of background partials suggesting a greater underlying stability over time than the simple r_{12} estimate would lead one to expect. Yet whatever these partials might be, it is obvious that they are even stronger in the American case, and that rates of decay are impeded much more.

One may in fact take the smoothed curves of Figure 1 and calculate the progression of higher-order partials implied by the behavior of these functions. These data are presented in the first two columns of Table 1

Table 1

Higher-Order Partials Implied by Empirical Decay Functions of Figure 1

Order of Partial		United States	France A	France B
First	($r_{13\cdot 2}$)	.261	.159	.046
Second	($r_{14\cdot 23}$)	.181	.092	.045
Third	($r_{15\cdot 234}$)	.129	.062	
Fourth	(..etc...)	.090	.042	
Fifth		.074	.027	
Sixth		.059	.046	
Seventh		.053	.031	
Eighth		.045	.026	

(the third column, "France B," will be considered below). In general, these computations tell us little beyond what is already apparent in Figure 1, although the squares of these partials would ordinarily (assuming

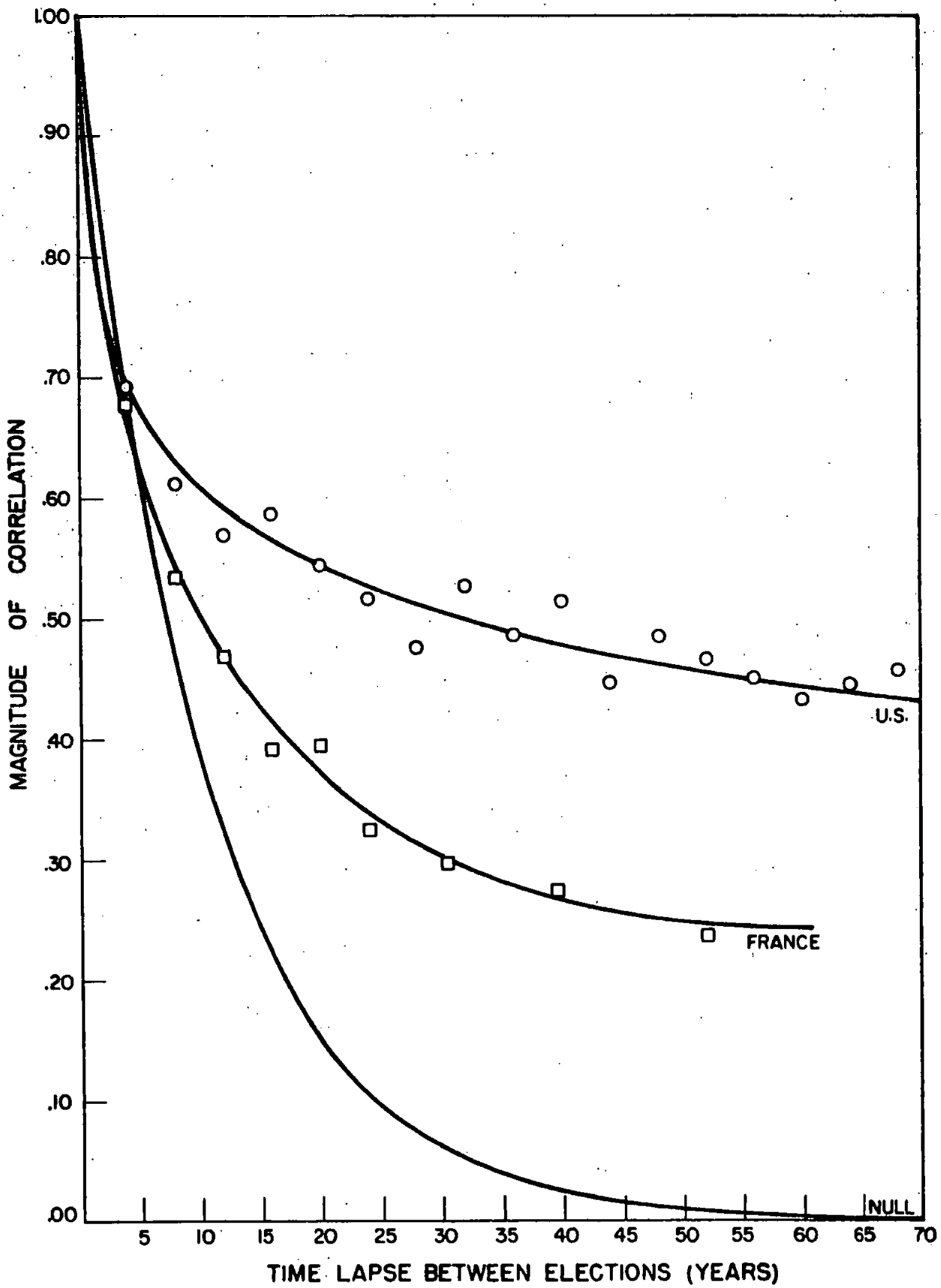

FIGURE 1. Null and Empirical Decay Gradients for France and the United States

data generated by product-moment correlations) suggest the additional proportion of variance accounted for given a knowledge not simply of the state of affairs in the next preceding election, but of progressively earlier elections as well. The first two such squares for the United States are .068 and .033; for France they are .025 and .008.

In short, subject to various obvious caveats, these data suggest that in the longer run, there is greater partisanship-tendance stability in the United States than in France. The list of caveats here is not dissimilar to that compiled for the MacRae paper. Perhaps most important is the fact that we are talking about rates of decay on a geographic base, and if the stability of the composition of the districts over the long period examined here were grossly different between the two countries, the differences in Figure 1 could arise in other ways than from variations in rates of individual political change. Thus, for example, if the French citizenry roamed en masse from department to department over this period, one might show apparently high rates of decay even were it true that no Frenchman ever wavered in his political loyalty. There is, however, no reason to suspect that conditions of geographic mobility are very disparate between the two countries.

It is true that the geographical units underlying the two batches of data are extremely disparate in average size, whether one deals in terms of population or area, the latter being conceivably important where rates of geographic mobility are concerned. However, examination of comparable matrices at finer geographic levels within the United States--scattered states of 80-120 counties, taken separately--show no tendency for the estimated rates of decay to be greater than when gross data at the level of the states are considered: if anything, for the few states available, the decay rates look lower, and hence even less like the French data. Thus there are no simple artifacts of unit size which account for the differences portrayed in Figure 1.

Nonetheless, the data of Figure 1 are arrived at through an averaging process which as always throws away information, some of which may include sufficiently systematic variation to remain of theoretical interest. Therefore let us briefly consider some of the internal patterns that lead to the composite representation in that graph.

First and foremost, let us point out that the French observations of Figure 1 turn out to be somewhat sinful, having been born of the illicit union of apples and oranges. As observed earlier, purity was maintained up to a point: all of the matrices contributing correlations to the averaged estimates involved apple-apple or orange-orange relations, and no apple-orange impurities. However, when the data were averaged, purity became impossible to maintain. The preferable submatrices, based on vote proportions rather than proportions of seats won, had enough observations for brief lapses of time and constituted virtually all of the data points for the longest stretches of time, but were too sparse for stable estimates (less than five observations) in the intermediate 20-40 year range. Hence correlations concerning seats were added in at this point to fill out stable estimates across the range of time intervals.

We can say a few tentative things about the effect that the addition of seat proportions has on our decay function estimate of Figure 1. Where there are sufficient observations to compare the two data sources meaningfully--primarily over the first third of the slope--correlations based on seats tend to run lower than comparable correlations for vote proportions. The differences are typically not large--.06 to .08--save in the first two observations. Elsewhere, there is a slight depressing effect exercised on the function by the inclusion of correlations based on seat proportions, although scarcely strong enough to account for the differences between the United States and French functions.

It is reasonable to assume that the correlations referring to seats tend to run lower because the measure is more crude and inadequate than those referring to vote proportions. However, there is another interesting possibility. In isolating the decay functions originally, we had faced the question as to whether, in averaging data over a 70-year period, we might not be concealing significant temporal variation in the decay rate. We were not particularly concerned with the fact that a stray election here or there might yield a rather aberrant estimate, as this could be quite easily understood (see below), and we were deliberately trying to winnow into clearer view the most general picture of the decay rate that could be constructed, short-term fluctuations aside. However, it was entirely possible some major secular trend in the decay rate had been occurring over this period, which our averages would conceal.

We had sufficient data to examine this possibility, by splitting the time period into halves (pre- and post-World War I). Our a priori expectations were that if any noteworthy differences by era were to be found, they would not occur on the American side. Rather, they would show up in the French data and suggest that decay rates were most rapid in the early period--Siegfried notwithstanding--with something of a firming-up process occurring in the later stages. After all, the French voting system was essentially a new one in the 1870's, and there are theoretical grounds to suppose that a population becomes psychologically anchored in a firmament of democratic parties only as it has some experience with it over time. The American system as of the 1870's had been participated in by the electorate for well over a generation.

As expected, either half of the American matrix would have generated essentially the same function as that appearing in Figure 1. There are slight differences in the averages during the two eras, and these differences do not appear to be random. The values of the decay function in the 1872-1908 period are consistently a shade greater than those for the period 1916-1960.[22] However, we are talking here of differences that average less than .04 over all values where comparisons are reasonable (where there are at least five observations on both sides). Hence we are quite satisfied that the results suggested in Figure 1 would not have been palpably different had we happened by chance on either of the shorter time intervals taken separately.

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[22]For reasons to be mentioned below, the 1912 election was systematically eliminated from the analysis and from the data in Figure 1.

At first glance, our expectations were also fulfilled on the French side, for values from the earlier period are indeed visibly lower than those derived after World War I. If this were a genuine trend, it would be of great interest, since the direction of the trend is the opposite of the slight differences found on the American side. Unfortunately, the Goguel coding is such that measures referring to proportions of seats come almost exclusively from the period prior to World War I. Thus the decrements in values of .06-.08 are the same we have already examined in connection with the differences between seat-based estimates and vote-based ones. Ideally, we should be able to cast light on the matter by asking whether the vote correlations from the earlier period look more like the seat estimates of the same period or the vote estimates of the later period. If one were forced to a choice, it does seem that the vote estimates from the early period look more like contemporaneous seat estimates (low) than they do like the later vote estimates. However, there are all of four vote-based correlations available from the earlier period and they are scarcely conclusive. Therefore it seems wisest to leave the point a moot one until more adequate data can be mustered.

What perhaps should be stressed is the fact that none of these variations--the slight absolute difference between periods on the American side or the larger difference between early seat-based estimates and later vote-based ones in the French data--is large enough to affect gross conclusions suggested by Figure 1. Differences in the estimated decay functions would be minimized by dealing with pure voting materials on both sides since 1916, and yet the two batches of data would remain very clearly discriminated from one another.

Indeed, there are sufficient initial observations in the pure voting materials from France to give good estimates of the beginning of the decay function (9 and 6 observations, respectively, for the first two mean values), and these first values would be .766 and .606, for these are the two points on which the seat-based estimates exerted their greatest depressing effect in Figure 1. If we took these as our estimates, rather than those of Figure 1, we would conclude that the French function started at a slightly higher point than the American (.77 rather than .70), but immediately declined below it at a precipitous rate. This would then suggest slightly less "noise" between adjacent pairs of elections in France, perhaps a witness to the responsiveness of the American electorate to a sequence of rather disparate short-term forces from election to election. But acceptance of such a possibility carries with it a corollary, which is that the background partials in the French case would be considerably weaker than Figure 1 suggests. We have entered in column "France B" of Table 1 the values which would be appropriate for the beginning of the decay function as indicated by the pure-vote materials. In this case, the partials are trivial from the very beginning.

While the French data are too fragmentary for any more intensive analysis, the American materials readily sustain further dissection. As we have seen, a "split-half" test indicates that our decay estimates there do not depend heavily on the era for which the time series is drawn, in the period since 1870. However, the averaging of the initial matrix

conceals contributions made by specific elections to the summary decay curve. We can now imagine a smoothed matrix, in which the entries along each diagonal are identical and the average value for the diagonal. Such a matrix represents a set of "expected values" in an actuarial sense, for the American decay gradient. And the matrix which is the difference between this expected matrix and the observed matrix gives us a residual matrix highlighting the differential contributions of the various paired election correlations to the summary decay function. A negative entry means that the pair of elections involved taken alone would suggest a more rapid rate of decay of partisan structure than the rest of the matrix attests to. A positive value indicates abnormally slow decay, or a heightened estimate of stability.

Once constructed, there are several alternate messages the residual matrix might convey. The positive and negative values might show no particular pattern at all over the surface, indicating that while there is inevitable variability in the decay estimates, it is too unsystematic across time to be of interest. Or again, there might be some clustering of negative values in the "early" or "late" portions of the matrix, although our split-half analysis has already ruled out this possibility. Finally, there might be some tendency for rows and columns associated with particular elections to show unusual proportions of negative or positive values. This would suggest that certain elections represented systematic intrusions on party stability, while other elections tended to underscore partisan stability.

Such a residual matrix in this case does show peculiarly consistent values associated with a small scattering of elections. The information can be summarized by taking algebraic sums along rows and columns associated with each election. When the set of elections are arrayed according to this summary value, the array is skewed, with few specific elections distinguishing themselves at the positive end of the distribution, but with five elections standing out in a long negative tail of the distribution. These are the elections of 1872, 1896, 1912, 1928 and 1960. The presence of the election of 1912 in this set is not surprising, since it is an election involving the principle three-party race in the period being studied. There are sobering difficulties involved in treating the three-way vote proportions in a fashion conceptually parallel to the rest of the data. In other words, its deviant status represents more of a measurement problem than a substantive datum of interest.[23] Of the remaining four deviants, we see that two are the now-familiar realigning elections of 1896 and 1928. While our current analytic operations are less well calculated to single out realignments than the MacRae methods tailored directly to this task, it is hardly surprising that moments of realignment should appear as contributing accelerated estimates of partisan decay to the overall matrix.

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[23]For this reason, all of the data presented in this paper have been based on the matrix of presidential elections from 1872 to 1960, with the data from 1912 excluded.

What is interesting is that an election like that of 1960, known from sample survey data to have had relatively slight realigning properties, should also appear. Of course, 1960 and 1928 form a natural pair in the series of American elections, both featuring a Catholic candidate for president and vote returns that tore away from many of their traditional party anchors toward a heightened religious polarization, in a fashion particularly apparent on a gross geographic base. Yet this and other characteristics of the array--such as the failure of the next elections after the realigning ones to show either extreme or distinctive values--suggests that the elections singled out as deviant have properties that realigning elections share, but which are not unique to such elections.

While no elections on the positive end of the array stand out as sharply as do those mentioned for the negative extreme, the three elections of the relatively quiescent 1880's all fall here. Of elections covered by post-war survey research, the largest positive value is shown for 1948, noted as a low-turnout, party-loyalty election.

Working from survey research materials, Campbell has associated surges in voting turnout with the entrance into the active electorate of individuals whose attachment to the standard parties is much weaker than that of more dutiful or experienced voters. Conversely, in an American election of relatively low turnout, voting tends to be left to the strongest party loyalists.[24] While realigning elections are typically "surge" elections in this sense, noteworthy surges are not necessarily accompanied by realignment.

If we classify the presidential elections in our set according to their "surge" or "decline" properties, by expressing the ratio of the turnout in each election to that of the average turnout among the eligible electorate in the next two preceding presidential elections, we find a product-moment correlation of -.55 between the two arrays: the more marked the surge, the greater the negative contributions to the residual matrix; the more notable the decline, the greater the positive contributions to the matrix.

This is a very satisfying result, for it lends considerable weight to our general interpretation of the initial matrix and its implied decay gradients. That is, had we limited our averaging to those elections showing surge properties, we would have estimated the rate of decay to be more rapid than that depicted in Figure 1, and would have inferred weaker levels of partisan identification in the population. If, on the other hand, we had drawn our averages from those elections involving a relatively shrunken, hard-core electorate, we would have found slower decay rates and inferred a greater degree of partisan stability. Yet these differences in results would not have signalled any unreliability in our procedures, for we would in fact be looking at two different cuttings of the electorate. Sample survey evidence based on individual data indicates quite strongly that these two cuttings of the electorate would differ in their average level of partisan attachment in exactly this way.

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[24] Angus Campbell, "Surge and Decline: A Study of Electoral Change," Public Opinion Quarterly, 24, Fall, 1960.

Thus we come full circle, and see that in averaging we have avoided dealing with either an abnormally swollen or shrunken electorate, and instead are representing in Figure 1 electorates of average size for American presidential elections. Had we turned our attention to off-year Congressional elections in an effort to avoid the strong short-term swings of the vote in presidential elections, our comparisons with the French data would undoubtedly have been even more disparate. Yet we would be loading the dice in attempting to compare the more partisan two-thirds of an "average American electorate" with an electorate of average size for French national elections. Most important, we have found the kind of interlocking evidence between sample survey evidence and patterns of variation in aggregate data which greatly enhances one's confidence that the aggregate information has been appropriately understood.

CONCLUSION

The contrasts between France and the United States that emerge from our pilot analysis are suggestive at best, and will require further examination with aggregate data better suited to the task. Our major purpose was to illustrate the kind of role that survey evidence can play in stimulating inquiries with aggregate materials, in guiding their execution, and in helping to increase confidence in the inferences from results.

In this paper we have worked entirely with the structure of voting statistics, as did the MacRae paper, although to quite different ends. Many other kinds of worthwhile analyses, each with unique goals, could be performed on the same limited base. Needless to say, there is no particular virtue in this narrowness, and in the long run we naturally will want to conduct similar analyses introducing further social, demographic and geographic variables. Growing data banks and increased computer power invite such activity.

At the same time, one cannot help but be impressed at the variety of departures that can be taken with voting statistics alone. And such departures have an important function as a springbroad to later and broader inquiries, for they investigate new ways of organizing aggregate data. They tend to generate a range of new dependent variables derived from the old, that are fruitful for further inquiries because their conceptual meaning is clearer than that of the raw statistics from which they are derived. Thus we are in a process of tool formation toward a new era of exploitation of aggregate materials. In this process, accumulated knowledge from survey research can be a critical ingredient.