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What is This?

RESEARCH NOTE

WHO'S AFRAID OF THE BIG BAD CYCLE? EVIDENCE FROM 36 ELECTIONS

Scott L. Feld and Bernard Grofman

ABSTRACT

We analyze 36 elections held by professional associations, unions, and non-profit organizations in England and Ireland. We show that these elections manifest a remarkably high degree of transitivity, with a Condorcet (majority) winner always found. Moreover, ordering alternatives according to their Borda score provides a transitive majority ordering in nearly all instances.

KEY WORDS • cycle • majority rule • public choice

Sociologists and social psychologists have warned of the dangers of reifying society or social groups (see, e.g., Shaw, 1971). Economists have seemingly demonstrated the impossibility of aggregating individual preferences into a meaningful collective choice (Arrow, 1963; Plott, 1976). Yet politics is an inherently collective activity. In contrast to much recent scholarship, which has focused on the importance of the paradox of cyclical majorities for democratic theory (see, e.g., Riker, 1982), we argue that collectivities often will be more consistent in their choices than will the individuals who comprise them. In the aggregate, individual idiosyncrasies tend to cancel each other out, laying bare the underlying structure of shared judgmental or ideological consensus (Feld and Grofman, 1986a,b; Grofman et al., 1983; Grofman and Feld, 1988; Inglehart, 1985; Stinchcombe, 1968).

We test our hypotheses about the structure of majority consensus with data from 36 elections in professional associations, unions and non-profit organizations in the United Kingdom. The data were made available to us by Professor Nicholas Tideman, Department of Economics, Virginia Polytechnic Institute and State University.[1] Elections had between 3 and 29 candidates and between 9 and 3422 voters.

1. The names of the organizations were deleted, pursuant to an agreement as to data confidentiality. All but three of the elections we analyze were conducted with the technical assistance of the Electoral Reform Society of England and Ireland. Data on the last three elections used in our analysis were gathered by F. D. Hill, Clinical Research Center, Division of Medical Statistics, Harrow, Middlesex, England. They are identified as H1, H2 and H3 (34, 35, 36). These data were also made available to us by Professor Tideman.

Because they were conducted using the Single Transferable Vote (STV),[2] which requires voters to rank order candidates, data on actual voter preferences are available for our analysis.[3] From these rank orderings, one can determine each individual's choices within every pair, and so can determine the pairwise margins among all alternatives. Since the exact STV procedure is complex, it is very difficult for individuals to anticipate benefits from strategic misrepresentation of their preferences; consequently, even though it is in principle possible for manipulation to occur (Doron and Kronick, 1977), it is reasonable to assume that the rank orderings that voters provide in these contests are accurate reflections of their true rank orderings.

We find that transitivity in majority preference is the norm in these 36 elections and there is *always* a majority winner. Moreover, not only are the decisions reached by majority voting in these elections far more likely to be transitive than has commonly been supposed, but they possess a strong aggregate-level internal coherence in that the ordering of alternatives is either perfectly or near perfectly given by their Borda scores, and thus, in most of these elections the Borda winner and the Condorcet winner coincide.

Data

Transitivity

There were not many cyclic triples among the 15,599 triples in our 36 elections. Indeed, only 71 (0.5 percent) of the 14,270 linearly ordered triples in our universe of 36 elections resulted in cycles. Moreover, there was not wide variation among elections (see Table 1). *Most elections* (24 of 36) *had no cycles of any kind*, and the largest proportion of intransitive triples in any election was 2.0 percent. Moreover, in only four of the 12 elections with cycles were more than half of the alternatives involved in the cycle, and no cycles were 'top cycles'.

Condorcet Winners and Their Coincidence with Borda Winners

There was a Condorcet winner in all of these elections. Although the Borda and Condorcet winner need not coincide, the candidate with highest Borda count was the Condorcet winner in 34 of the 36 elections[4] (see Table 2).

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2. STV, also known as the Hare System, is a form of proportional representation. The single transferable vote procedure has been used in a variety of situations. In the United States, it has been used for selecting community school boards in New York City since 1970. It has occasionally been implemented for other governmental bodies, including at one time or another during this century more than 25 US cities (Grofman, 1981), but it has received much greater application in Great Britain (Lakeman, 1982; see also Lijphart and Grofman, 1984). A few of the elections we study were conducted under a special case of STV, AV, the alternative vote.

3. Sometimes, however, preference orderings are incomplete. For any voter, we treat non-ranked alternatives as tied, ranked below all ranked alternatives.

4. If Borda margins are satisfied, then the Borda winner *is* the Condorcet winner. We expect that if the Borda margins condition is nearly satisfied, there is likely to be a Condorcet winner and that the Condorcet winners are very likely to coincide, and this is indeed what we find. See below.

Table 1. Analysis of Triples in the 36 Elections of the Tideman Data Set

Election No.	Voters	Candidates	Tied Triples	Intransitive Triples	Non-Borda Margins	Total Triples	Intransitive (%)	Non-Borda Margins among Transitive Triples (%)
33	129	3	0	0	0	1	0.0	0.0
30	58	3	0	0	0	1	0.0	0.0
29	68	3	0	0	0	1	0.0	0.0
25	183	3	0	0	1	1	0.0	100.0
31	32	4	0	0	0	4	0.0	0.0
28	115	4	0	0	0	4	0.0	0.0
32	148	5	0	0	3	10	0.0	30.0
26	100	5	3	0	0	10	0.0	0.0
24	82	5	0	0	3	10	0.0	30.0
20	2785	5	0	0	5	10	0.0	50.0
16	2151	5	0	0	2	10	0.0	20.0
27	77	6	4	0	2	20	0.0	12.5
18	976	6	0	0	0	20	0.0	0.0
19	860	7	0	0	7	35	0.0	20.0
8	78	7	0	0	2	35	0.0	5.7
21	760	8	0	0	14	56	0.0	25.0
6	280	9	7	0	31	84	0.0	40.2
2	371	9	0	0	12	84	0.0	14.2
11	963	10	0	0	27	120	0.0	22.5
1	380	10	0	1	15	120	0.8	12.6
22	44	11	17	3	38	165	2.0	26.2
9	3422	12	0	0	38	220	0.0	17.2
17	867	13	0	1	75	286	0.3	26.3
35[a]	63	14	24	3	78	364	0.8	23.1
4	43	14	35	0	50	364	0.0	15.1
3	989	15	0	2	96	455	0.4	21.1
5	762	16	0	0	52	560	0.0	9.2
36[b]	176	17	30	9	181	680	1.3	28.2
14	73	17	58	10	178	680	1.6	29.0
7	79	17	15	0	89	680	0.0	13.3
34[c]	9	18	277	4	127	816	0.7	23.7
10	83	19	130	0	161	969	0.0	19.1
12	76	20	141	1	170	1140	0.1	17.0
15	77	21	73	9	231	1330	0.7	18.5
13	104	26	364	12	502	2600	0.5	22.5
23	91	29	80	16	726	3654	0.4	20.4
Totals:	17,554	396	1258	71	2916	15,599	0.4	20.4

[a] Election number H2. [b] Election number H3. [c] Election number H1.

Table 2. Analysis of Coincidence of Borda Winner and Condorcet Winner in the 36 Elections of the Tideman Data Set

Election	Candidates	Voters	Condorcet Winner	Borda Winner is Condorcet Winner	Reversals	Alternatives in each disjoint cycle
1	10	380	Y	Y	0	3
2	9	371	Y	Y	0	0
3	15	989	Y	Y	1	4
4	14	43	Y	Y	1	0
5	16	762	Y	Y	1	0
6	9	280	Y	Y	2	0
7	17	79	Y	Y	1[a]	0
8	7	78	Y	Y	0	0
9	12	3422	Y	Y	1	0
10	19	83	Y	Y	3	0
11	10	963	Y	Y	0	0
12	20	76	Y	Y	1[c]	3
13	26	104	Y	Y	1	17
14	17	73	Y	Y	1	7,4
15	21	77	Y	Y	1	9
16	5	2151	Y	Y	1	0
17	13	867	Y	Y	1	3
18	6	976	Y	Y	0	0
19	7	860	Y	Y	1	0
20	5	2785	Y	No	1	0
21	8	760	Y	Y	1	0
22	11	44	Y	Y	0	6
23	29	91	Y	Y	1[b]	5,9,3
24	5	82	Y	Y	0	0
25	3	183	Y	Y	0	0
26	5	100	Y	Y	0	0
27	6	77	Y	Y	0	0
28	4	115	Y	Y	0	0
29	3	68	Y	Y	0	0
30	3	58	Y	Y	0	0
31	4	32	Y	Y	0	0
32	5	148	Y	Y	0	0
33	3	129	Y	Y	0	0
34(H1)	18	9	Y	No	2[d]	9
35(H2)	14	63	Y	Y	2	3
36(H3)	17	176	Y	Y	2	8

[a] In addition, Borda count alternative 13 belongs before 8 in the transitive order.
[b] In addition, Borda count alternative 20 belongs after 22 in the transitive order.
[c] In addition, Borda count alternative 12 belongs before 1 in the transitive order.
[d] In addition, Borda count alternative 5 belongs after 7 in the transitive order.

Coincidence of Borda Ordering with Transitive Ordering

The transitive ordering and the ordering according to Borda counts need not coincide; but this occurred in 14 of our 24 transitive elections. Even more importantly, when deviations between the Borda ordering and the transitive orderings occurred, they were minimal, and tended to occur when some alternative was preferred to the alternative immediately higher than it in Borda score. Indeed, in the 24 transitive matrices, of the 14 departures of Borda order from transitive order, 13 occurred between alternatives adjacent to each other in Borda score. (To see this, we look in Table 2 at the elections with no cycles and count the number of reversals.) In other words, when voting was perfectly transitive, except for a handful of alternatives nearly indistinguishable in their Borda scores, the Borda count perfectly specified the order of majority preference.

Discussion

When we examine the nature of the choices made by voters in the set of 36 recent elections in private organizations in Great Britain held using STV, we find that every election had a Cordorcet winner. Where there were intransitivities they included only a limited number of elements. Of the 36 elections, 24 are perfectly transitive. Moreover, in those cases where intransitivities do occur, almost the only observed intransitivities are between alternatives adjacent in Borda scores, and in 34 of 36 elections the Borda winner and the Condorcet winner coincided. These empirical results are quite strong and, we think, rather surprising. While some previous research (e.g. Chamberlin and Cohen, 1978; Coombs et al., 1984; Feld and Grofman, 1988a; Niemi and Weisberg, 1974; Niemi and Wright, 1986; cf. Tullock, 1970, 1981) has shown that transitive majority preferences are (and ought to be) more common than could be anticipated in a random culture, we believe ours is the first systematic empirical investigation of the structure of majority preference over a range of electorates. We have not exorcised the paradox of cyclical majorities; we have, we hope, put its importance for ordinary political choice into more realistic perspective.

Arrow's Impossibility Theorem (Arrow, 1963) is commonly interpreted to 'cast doubt on all notions that explicitly or implicitly attribute preferences to society that are comparable to preferences for an individual' (Feldman, 1985: 191). However, Arrow requires that an aggregation mechanism must work perfectly for all *possible* patterns of preference. We have shown that, in important ways, collectivities can be treated as unitary actors. Indeed, in some ways the behavior of aggregates may be more structured and more predictable than that of the individuals who comprise them. Collectivities are not only transitive (or nearly so) but, perhaps just as importantly, they satisfy strong consistency properties such as the predictability of the direction of majority preferences from the magnitude of Borda scores.

The majority consensus that we are finding could have several different origins, including widely shared perceptions of candidates' levels of experience, intelligence or competence, or such a prosaic phenomenon as choices based on name recognition

or the amount of money spent on the campaign.[5] Much of politics is a debate about
the 'public interest' where means not ends are in dispute. Even in elections, the ques-
tion may be who can get the job done (e.g. controlling inflation and unemployment).
In small groups especially, choices among candidates may hinge more on judgments
about experience or competence (or simply on name recognition) than on matters that
could be described in ideological terms. However, identifying the specific sources of
evaluative agreement in the various elections is beyond the scope of this paper. The
data we were provided by Professor Tideman were gathered subject to the agreement
that the specific organizations involved would remain anonymous even to researchers
permitted access to the database.

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5. If the individuals in society are posited to be essentially homogeneous in their *marginal*
predilection to be ideologically (or judgmentally) consistent, we would expect that virtually all
societal subsets would be ideologically (or judgmentally) consistent. On the other hand, if there
are a handful of ideologically consistent individuals, we would expect that they would be non-
randomly distributed across social subgroups. Thus, some subgroups ought not to have a large
enough critical mass of individuals sharing a common ideological (judgmental) view of the
world (orienting ordering) so as to give rise to collective ideological (judgmental) consistency
for that subgroup.

Feld and Grofman (1988b), who look at the candidate preference for the US Presidency in
1980, find a large degree of collective ideological consistency in every subset they examine, and
argue that the 'widespread low-level diffusion' model is a better approximation of the empirical
situation than the second model. However, some of their evidence can be interpreted as being
in favor of the second model — which posits a small non-randomly distributed ideological
'elite'. For the case of judgmental margins this remains an issue for future research, although
our preliminary analysis suggests that a widely diffused dimension of evaluation, when com-
bined with most voters having specific preferences over only a few alternatives, accounts for
the high degree of transitivity in most of the elections we examine.

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