This article concerns the nature of "collective" preferences, when preferences inhere only in individuals. Economists (e.g., Arrow) have concluded that there is no reasonable way to combine individual preferences. Nevertheless, sociologists routinely treat collectivities (e.g., small groups, organizations, social classes, or ethnic groups) as entities with consistent preferences. This article suggests that consistency of collective choices arises from the social context. Specifically, many collective choices are matters of "judgment," rather than matters of purely personal "preference." In matters of judgment, natural groups tend to have shared standards that are used by individuals in determining their own preferences. Under such conditions, even when many individuals "get it wrong," the group majorities tend to "get it right." Social philosophers have suggested that when individuals attend to the public good, group majorities tend to accurately reflect the collective interest (Durkheim's "collective conscience" and Rousseau's "general will"). However, these philosophers have never suggested any empirical indicators of the emergence of the collective interest. This article suggests that if individuals are judging alternatives by shared standards, then there should be predictable patterns in the sizes of the majorities by which they make their choices. Votes from 36 different elections in nonprofit organizations, unions, and professional associations are analyzed and shown to be consistent with the patterns expected to arise from judgments by shared standards. Implications for future research into a wide variety of interdisciplinary issues are discussed.

Collectivities as Actors

CONSISTENCY OF COLLECTIVE CHOICES

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Sociologists and other social scientists often treat collectivities (e.g., small groups, organizations, social classes, or ethnic groups) as entities with

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consistent preferences. Although this has been a fruitful theoretical approach, the failure to explain and justify the concept of "collective preferences" has made this work vulnerable to criticisms of reification and mystification of collectivities. The present work is intended to explain why it is reasonable to treat many collectivities as actors with consistent collective preferences.

Treating collectivities as actors requires internal consistency of decisions. An individual or collective actor can be considered as a single actor if it makes decisions that are consistent with each other; that is, if it prefers A to B, and it prefers B to C, then it prefers A to C. The utility of such an assumption is that it allows the observer to draw a wealth of inferences about the actor's choices from a relatively small amount of information.

Showing that collectivities can make consistent choices has practical as well as theoretical significance. As a practical matter, the vast majority of corporate actors in society are supposed to reflect the will of collectivities. For example, governments are supposed to reflect the collective will of their citizens, corporations are supposed to reflect the collective will of their stockholders or at least of their board members, and university departments are supposed to reflect the collective will of their members. If collectivities of citizens, board members, and department members cannot make consistent choices, following their preferences would require their governments, corporations, and departments to act in self-contradictory ways. Our work is intended to show how it is possible for corporate actors to be guided by collective decisions and still make consistent choices.

THE ECONOMIC APPROACH AND THE SOCIAL CONTEXT

Economists have taken on themselves the problem of devising a "social welfare function," that is, a way of aggregating individual choices into collective decisions. Although the formalism of their approach often obscures its relevance, this problem is most important for sociologists. Their

task is to find how collectivities can make consistent decisions that fairly reflect the choices of their members.

Kenneth Arrow's (1963) Nobel prizewinning work in economics showed that it was impossible to devise a collective choice mechanism with reasonable properties (e.g., nondictatorship and independence of irrelevant alternatives) that necessarily produces consistent (i.e., transitive) collective preferences. This has troubled a great many people ever since.

However, the problem is more with the economic theory than with actual collective decisions. The problem with the economic theory is its neglect of all aspects of the "social" context. As Granovetter (1985) explained, economic action is embedded in a social context. Various aspects of social context lead to effective collective decision making (cf. Shepsle and Weingast 1981a, 1981b; Feld and Grofman 1986, 1988). In this article, we focus on how a diffuse social consensus concerning social "judgments" underlies the consistency found in many collective choices.

The economic theory with regard to collective decision making begins with the premise that individuals make choices based on their "independent" self-interests. It assumes that individual self-interests can take any form. Consequently, the theory concludes that it is difficult or impossible to develop a reasonable mechanism for aggregating all possible combinations of individual choices.

In contrast, it is natural for sociologists to suggest that there is often a "shared cultural preference" (cf. Romney, Weller, and Batchelder 1986) that is expressed in the individual choices. The notion of a shared cultural preference has a long, distinguished history in social theory, especially in the French tradition. Rousseau's (1984) concept of the "general will" reflected his belief that a diffuse understanding of the public good may be present within the society (see Grofman and Feld 1988). Comte (1981) and Durkheim (1985) had similar concepts of the "consensus universalis" and the "collective conscience," respectively (see discussions in Turner and Beeghley 1981, esp. 327, 336-7).

Despite the widespread discussion of Rousseau's "general will" and Durkheim's "collective conscience," these concepts have been difficult to intepret or operationalize. We suggest that the consistency of collective decisions often both reflects and indicates the presence of a collective conscience (shared cultural perspective or general will).

Condorcet (1785) was the first to explicitly recognize that voting could be an effective method for discerning a "consensual" choice that is only dimly perceived by each individual. Consistent with Durkheim's sociological ap-

proach, we suggest that the collective conscience might describe a diffuse form of social consensus "on average" that is sufficient to determine the consistency of collective decisions. We suggest that there need not be high levels of individual agreement for the collective conscience to pervade societies or subgroups of societies. Individuals may diverge widely from the social average while the average remains a relatively stable and predictable aspect of social life. It is our intent to provide a specific empirical interpretation and show how the nature of a shared cultural perspective facilitates the reaching of consistent collective decisions.

As a first approach to the study of collective judgments, we analyze data from one set of comparable elections. Although results based on these data do not necessarily generalize to other contexts, they provide one systematic demonstration of the patterns of choices that arise from collective judgments.

COLLECTIVE JUDGMENTS

Collectivities have been using voting for making judgments since the earliest recorded instances of voting in Greece and Rome (Pitkin 1967; Stavely 1972). Early uses of voting included selecting generals and deciding which individuals would be ostracized, both apparently taken to be judgment rather than personal preference decisions. Rousseau indicated that he intended that voting would be used to make choices in the public interest. However, the modern dominance of economists in this area of research, and their stress on conflict for scarce resources, has led judgments of collective interests to be all but neglected in recent considerations of collective decision-making processes.

Without denying the importance of conflicts of interests, important parts of the sociological tradition have emphasized the consensual aspects of social life. Even those writers who focus on conflict tend to assume consensus within subparts of society (e.g., within social classes, ethnic groups, religious communities, or nation-states). We believe that collective decision making is often a process of finding the consensus "on average" that exists within groups. Some circumstances orient individuals toward narrow self-interests, while others orient them toward making judgments about the "best" alternatives. In this article, we show how an orientation toward judging the "best" choices is often reflected in the consistency found in collective decisions. The present theory is intended to apply to those collective decisions that most reflect judgments.

RANGE OF APPLICATION

There are many different judgment situations to which this theory might apply. We mention a few examples to illustrate the broad range of potential applications.

One of the situations that may be most familiar to academic sociologists involves committee decisions on policy. For example, sociology departments often have graduate policy committees that decide among alternative requirements and curricula. Although there are special interests that are reflected in the choices of individual members of these committees, we expect that many of these decisions are primarily matters of collective judgments.

Many types of elections involve the collective judgments about the best candidates (e.g., school board elections often provide good examples). Although individual voter choices reflect private self-interests, subgroup special interests, and ideological perspectives, we expect that, overall, collective choices primarily reflect shared values concerning such areas as competence, character, and experience.

Certain sociometric choice rankings presumably reflect judgments. For example, we expect judgment patterns if students are asked to rank other students on the basis of who they would like to do their homework for them, or even if they are asked to rank order their preferences for student officers. However, if students are asked to use a criterion that reflects their personal level of intimacy with others, we do not necessarily expect the judgment patterns.

In the next section, we describe the nature of patterns that we expect to characterize collective decision making that is judgmentally based.

PATTERNS OF COLLECTIVE JUDGMENTS

First, it is important to show how inconsistency of collective choices could occur. Suppose that a committee was trying to decide among three candidates for a position. The committee might compare each candidate with each other candidate and accept the choice of the majority. Unfortunately, voting might result in cyclical choices, as in the following example. Suppose that there were three members of the committee (Members 1, 2, and 3) and three alternatives (Abel, Baker, and Charlie). Assume further that each member had a position in two dimensions, as shown in Figure 1, and each member preferred the alternative that was closest to his or her own position, the second closest, second, and the furthest, third.

$$C_{harlie} \quad 1$$

$$3$$

$$A_{bel}$$

$$2$$
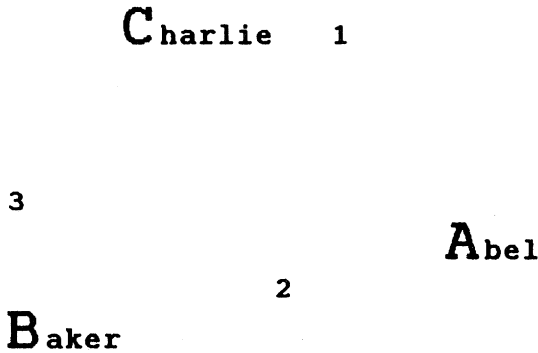
$$B_{aker}$$

Figure 1:   Three voters (1, 2, and 3) with cyclical majority preferences among three
candidates (Abel, Baker, and Charlie).
NOTE: This is assuming that each voter prefers spatially closer candidates.

Members 1 and 2 would prefer Abel to Baker, Members 2 and 3 would
prefer Baker to Charlie, and Members 1 and 3 would prefer Charlie to Abel.
Thus there is a cyclical majority preference; majority rule results in a
preference for Abel to Baker, Baker to Charlie, but Charlie to Abel. If there
were such cyclical choices, the group could be reviewing its previous
decisions over and over again—without resolution. While we might like to
think that this example represents a contrived situation, Plott (1967) and
others have shown that this type of cycling is essentially inevitable in all
situations where a group is free to choose from among all positions (alterna-
tives) in a two-dimensional space (and also in more dimensions). Further-
more, theorists have shown that when individuals have random preferences
over any large set of alternatives, cyclical majorities are expected to occur
often (Niemi and Weisberg 1968).

On the other hand, many people (e.g., Tullock 1981) have observed that
collectivities actually appear to do pretty well; cyclical majorities are rarely
observed; that is, it is rare to find an alternative that is first rejected and
subsequently chosen by a majority. Intrigued by the absence of majority
cycles despite strong theoretical arguments that they should be so frequent,
we look to the nature of decisions as "judgments" to understand how it is
possible for collectivities to make consistent decisions by majority rule.

Despite the theoretical possibility of all possible individual preference
orderings, we suggest that choices are often structured to make majority
cycles unlikely. Specifically, many collective decisions concern which alter-

native is collectively "best," rather than individually preferable. In such situations, the only sources of disagreement are chance and the individuals' less-than-perfect competences to discern the best choice. This was first made explicit in the 200-year-old work of Condorcet (1785). Suppose that three individuals are each correct 80% of the time. By a simple analysis of the combinations, the majority is expected to be correct almost 90% of the time, more often than any single individual.[1]

We suggest that one reason why collectivities make consistent decisions is because the individuals are attempting to make the "correct" decisions; sometimes the correctness is objectively defined, and more often, it is socially defined. In any case, there are individuals who are more or less competent, and the overall majority is often very competent at making decisions. This is, of course, only an ideal type, but we believe that it is a useful approximation to many situations.[2]

IMPLICATIONS OF THE AGGREGATION OF JUDGMENTS

When individuals are making choices where there is an objective criterion of "best," there is no ambiguity to the meaning of "competence." However, we intend that the notions of "correctness" and competence can be extended past the bounds of objective judgments to include the types of choices that involve discerning a social concensus. If the "social consensus" is merely defined by the majority choice, then the majority is inevitably correct; this is a tautology with no empirical content. However, the process of aggregating judgments has other implications that are nontautological; even in situations where groups are not making objectively verifiable judgments, the attempts to make judgments have implications that can be empirically tested and that make our theory falsifiable.

First, we suggest that a diffuse social consensus is reflected in the tendency for groups to make decisions by larger majorities than would be expected in the absence of a shared standard. If there were no shared standards, then approximately half of the voters would vote each way on every decision.

The greater the "average" competence of individuals, the larger the average size of majorities and the larger the margins. We do not expect that small margins will be absent entirely; in fact, they should be almost as common as expected by chance in those decisions where the average competence of individuals is least (e.g., when two alternatives have very similar value to the group, or when the individuals in the group have little information

with which to differentiate between the alternatives). Nevertheless, we expect that the overall frequency of small margins will be considerably less than expected by chance.[3]

It has been our experience that most decisions in groups exhibit overwhelming agreement. Even when there is disagreement, bare majorities are the exception rather than the rule. Close decisions are often given the most attention by group members and observers because they involve the most controversy, but we expect that any objective counting of the decisions made by groups will show that most decisions are made by relatively large majorities.

Second, we suggest that a diffuse social consensus is reflected in the absence of majority cycles, as in the choice among Abel, Baker, and Charlie that we previously described. If each of the committee members has sufficient competence to order the alternatives in nearly the correct way, then the committee will be very likely to make each pairwise decision in the correct way, and so make transitive, not cyclic choices, for example, preferring Abel over Baker, Baker over Charlie, and Abel over Charlie.

Third, we suggest that when there is such a shared basis for judgments, a collectivity will not only correctly order the alternatives but reflect the ordering in its pattern of collective preference margins. In this situation, we expect that a greater majority will prefer Abel over Charlie than over Baker because the former choice involves a simpler decision that more members of the group are likely to make correctly. Similarly, we expect that a greater majority would prefer Abel over Charlie than would prefer Baker over Charlie for the same reason. We can represent these predictions in a matrix of margins. The matrix might look like Table 1.

In general, we expect that margins of collective judgments can be arranged so that the margins will increase as one moves to the right and upwards in the matrix; the upper right margin will be the greatest. This is an empirical prediction that is stronger than avoiding cycles.[4]

The germ of this idea was present in a decision-making mechanism proposed by Jean-Charles de Borda ([1781] 1953) over 200 years ago; this commonly used method is often called the "Borda count" (Black 1958). In the Borda method, each individual ranks the alternatives. For each individual, points are assigned to each alternative according to the rank (zero for the least favored, 1 for the next least favored, and so on) and then summed over individuals. The total points (the "Borda counts") determine the collective ordering; the alternative with the most points is the first choice of the group. It is relatively easy to show that this procedure is equivalent to determining the group preference ordering according to the ordering of the row sums in

TABLE 1:   Matrix of Pairwise Margins

	A	B	C	Row Total
A	0	10	25	35
B	−10	0	15	5
C	−25	−15	0	−40

the matrix of margins; the alternative corresponding to the row with the largest row sum is the first choice of the group. The row sum in the matrix of margins is directly related to the Borda count as a linear transformation; thus, it is simple to convert either one to the other. Since our present focus is on margins, we will usually refer to the row sums in the following discussion; the equivalence and transformation to Borda counts can always be made.

The pattern of margins that we expect to arise in judgment situations, as we have described and illustrated in Table 1, can be reexpressed in terms of the overall pattern of margins when the alternatives are placed in row sum (Borda count) order. In this pattern, the alternative with the greatest row sum has the greatest margin in every column. For example, in Table 1, alternative A has the largest row sum and the largest margin in every column. When this pattern occurs, there will be the identical ordering of margins within every column (i.e., the row with the largest value in one column will be the row with the largest value in every other column, the row with the second largest value in one column will have the second largest value in every other column, and so on); in other words, the rank order correlations between any pairs of columns will be 1.0. Because this pattern of margins is completely described by the order of the Borda counts, we refer to this pattern of margins as the "Borda pattern of margins" or simply as "Borda margins." We emphasize that "Borda margins" are expected to arise when individuals are making judgments based on a shared standard, but are not inevitable otherwise.[5]

Although others have suggested that majority margins may be dispropor-tionately large and that majority intransitivities seem to be rare, we believe that this is the first presentation of the Borda margins conditions.

THE DATA

Nicolaus Tideman provided us with ballots of 36 elections held by nonprofit organizations, unions, and professional associations on which voters were asked to rank order the candidates.[6] The data were the original

TABLE 2:   Actual Margins for an Illustrative Election (No. 1) Among the 36 Examined

	A	B	C	D	E	F	G	H	I	J	Total
A	0	147	105	124	210	184	118	82	71	161	1202
B	−147	0	−65	−12	75	64	5	−43	−115	33	−205
C	−105	65	0	43	150	137	52	13	−59	96	392
D	−124	12	−43	0	110	89	−1	−33	−97	54	−33
E	−210	−75	−150	−110	0	−13	−77	−114	−165	−42	−956
F	−184	−64	−137	−89	13	0	−70	−114	−176	−31	−852
G	−118	−5	−52	1	77	70	0	−29	−107	59	−104
H	−82	43	−13	33	114	114	29	0	−84	102	256
I	−71	115	59	97	165	176	107	84	0	157	889
J	−161	−33	−96	−54	42	31	−59	−102	−157	0	−589

ballots (or, in a few large electorates, a large random sample of the ballots) on which the voters ranked the candidates. The number of ballots ranged from 9 to 3,422, most having over 100. The number of candidates ranged from 3 to 29, with a mean of 10; 90% had 5 alternatives or more.

In order to interpret the frequencies of transitivity and Borda margins in the empirical data, we determined the frequencies of transitivity and Borda margins in a "random culture," that is, where all individual preference orderings were equally likely. It is complex to calculate these probabilities; instead, we used simulations.

We simulated elections; details of the simulations are included in the appendix. Consistent with previous analyses (e.g., Black 1958; Niemi and Weisberg 1968), we found that 9% were intransitive (had cycles); of the transitive triples, we found that 48% had Borda margins. These frequencies provided baselines; we compared the actual frequencies of intransitivities and Borda margins with the frequencies that arise from a random culture.

RESULTS OF THE DATA ANALYSIS

We tallied the margins of preference among the alternatives in each election. The matrix of margins from one election is provided in Table 2 as an illustration. This election was held in a nonprofit organization; there were 10 candidates, and 380 voters. In Table 2, the candidates are shown in the order in which they appeared on the ballot.

Inspection of this matrix shows that the margins are much greater than would be expected by chance. In a random culture, with 380 voters, only 5%

TABLE 3:   Reordering of Candidates From Table 2 in Order of Their Row Sums

	A	I	C	H	D	G	B	J	F	E	Total
A	0	71	105	82	124	118	147	161	184	210	1202
I	−71	0	59	84	97	107	115	157	176	165	889
C	−105	−59	0	13	43	52	65	96	137	150	392
H	−82	−84	−13	0	33	29	43	102	114	114	256
D	−124	−97	−43	−33	0	−1	12	54	89	110	−33
G	−118	−107	−52	−29	1	0	−5	59	70	77	−104
B	−147	−115	−65	−43	−12	5	0	33	64	75	−205
J	−161	−157	−96	−102	−54	−59	−33	0	31	42	−589
F	−184	−176	−137	−114	−89	−70	−64	−31	0	13	−852
E	−210	−165	−150	−114	−110	−77	−75	−42	−13	0	−956

of the margins would be greater than ±38 (i.e., ±10%). Table 2 shows that 90% (81) of the 90 margins were actually greater than ±38. Clearly, these margins could not arise in a random culture.

The raw matrix does not easily reveal its orderly pattern of margins, but a reorganization according to the row totals as shown in Table 3 makes the ordering clear. First, all but two of the margins above the main diagonal are positive numbers. The only exceptions are DG and GB, with margins of −1 and −5, respectively. Since all of the other margins above the main diagonal are positive, all of the other majority choices are consistent with this ordering of alternatives, and all triples other than DGB are transitive.

In addition, the margins have a strong tendency to follow the Borda ordering. It can be seen that the margins just above the main diagonal are generally small positive numbers; the margins tend to increase as one moves to the right and up the matrix toward the largest margin in the upper right between A and E.

The same types of analysis were carried out for all 36 elections and the results were consistently supportive of our expectations. These are summarized in Table 4. It is important to note that large margins, transitivity, and Borda patterns are much more common than would be expected to arise from random sampling fluctuations; and it is more important to recognize that these findings indicate that each of these aggregates has reasonably consistent collective preferences.

First, we considered the sizes of majorities by counting the proportions of binary choices that were decided by margins of at least 10% and comparing that with the numbers that would have been larger than 10% due to chance.[7] As shown in Table 4, 50% of the margins were found to be at least 10%

TABLE 4:   Summary of Comparisons Between the 36 Elections and Simulations

	Expections for Random Preferences (based on simulations and analytic results)	Findings in the 36 Elections	
Proportion of margins greater than 10%	30%	50%	(2,805)
Proportion of transitive triples	9%	0.5%	(13,341)
Proportion of transitive triples having Borda margins	48%	78%	(2,916)

compared to the 30% that would have been expected to be this large by chance. As we anticipated, the overwhelming majority of the small margins that were found were between alternatives that had very similar Borda counts (row sums), and so might be considered similar in collective value.[8]

Next, we considered the frequencies of cyclical majorities. Excluding the 1,258 triples of alternatives in which there were ties, there were 13,341 triples; of those, only 0.5% were intransitive. This is an insignificant number of cycles by any standard and far fewer than the 9% that were found when individual preference orderings were derived from a random culture.

Furthermore, the infrequency of cycles indicates that the few cycles that were found tended to be "local," that is, including only a few alternatives.[9] For example, in Table 3, the only majority cycle is formed by D, G, and B; D beats B as expected, but B beats G and G beats D. It is clear that alternatives in the cycle (D, G, and B) are the most similar in Borda counts, row sums, and row averages (e.g., the best to the worst differing by an average of only 23.8 votes). This collectivity would have no difficulty in making choices among the alternatives, except in the few cases where the alternatives are of the most similar value.

Finally, we found that the patterns of margins are even stronger than would be expected to accompany transitivity, as shown by a disproportionate occurrence of Borda margins. A large proportion (78%, or 2,916) of the transitive triples in the 36 elections had Borda margins in these data. This means that in the large majority of triples, the pattern of margins is consistent with the transitive ordering; knowing how alternatives fare against others tells us a lot about how they will fare against one another. For example, if one alternative is beaten by a larger majority than another, then it is very likely that the one is beaten by the other.

The frequencies of Borda margins in the data are much higher than would be expected if preferences were random; as previously indicated, 78% of the transitive triples had Borda margins in these elections compared with only 48% of the transitive triples having Borda margins in a random culture. These data clearly indicate substantial tendencies to follow the patterns that were anticipated to arise from shared standards.

The relatively few triples that did not have Borda margins tended to involve three alternatives that were all very close in Borda counts, row sums, and row averages. This can be seen by further inspection of the example in Table 3. Recall that the alternatives are presented in Borda count order; it is apparent that row margins tend to increase as one moves across any row to the right (or up any column); the departures from this pattern (when a row margin to the right is less than one to its left) are nearly always in adjacent or nearly adjacent columns.

Further evidence of the close approximation to the Borda margins conditions can be obtained by examining the correlations between columns (or between rows, since each row is the negative of its column). As mentioned earlier, Borda margins imply a perfect (1.0) correlation between the ordering of the rows within columns.[9] It is apparent in the example in Table 3 that the correlation between any two columns (or rows) is very high. Specifically, for the 45 pairs of columns (or rows), the mean correlation is .98. This is typical; for all of the pairs of columns in the 36 elections, the mean correlation is .94. It should be clear that in every one of these elections, there is a large amount of consistency in the pattern of margins, as would be expected to arise from judgments.

In addition, every one of the 36 elections had one candidate that was majority preferred to all others; there was never any ambiguity or cycles involving the first choice of the groups. In addition, the first choice was the candidate with the highest Borda count (row sum/row average in the matrix of margins) in 94% of the elections.[11]

Finally, and most important, although there were some local cycles in some elections, the "preferences of the collectivity" are perfectly clear in almost all comparisons among candidates. Of the 2,805 pairwise comparisons that could be made among candidates within the 36 elections, fully 88% of the pairs were not involved in any cycles whatsoever; that is, there could be no ambiguity about the preferences of the group in these choices. As previously indicated, the relatively few pairs of candidates that were involved in a cycle were very similar in their value to the group, as indicated by their Borda counts; ambiguity might be expected and accepted as indicating "close

calls" in those cases. Thus it appears that the group preferences tended to be clear wherever there were sufficient differences between candidates.

SUMMARY AND FUTURE RESEARCH

We take these findings to support our contention that these collectivities can reasonably be treated as consistent decision makers. The majorities make almost entirely consistent choices in each of these collectivities.

Furthermore, the strengths of the collective preferences (as indicated by the sizes of the majority margins) are generally consistent with the ordering of their choices. This pattern of margins facilitates collective choices. For example, a collectivity can generally find its own transitive collective preference ordering merely by using the margins by which the alternative is preferred to the status quo to indicate the relative preferability of each alternative. The other alternatives do not need to be directly compared with one another. When Borda margins are closely approximated, then most any collective decision mechansim produces very similar if not identical choices.

Our work is an introduction to the empirical study of collectivities as consistent decision makers. We have demonstrated a high level of consistency in the preferences of 36 collectivities, but we have not been able to analyze factors that influence the extent of consistency. While these data have the rare advantage of providing individual preference orderings over a large number of alternatives, they also have the unfortunate disadvantage of providing little information about the groups, conditions, or specific candidates. We expect that some conditions are more conducive to the expression of "judgments" than others, but this must be the subject of future study.

In addition, we hope that this work can stimulate and contribute to several lines of interdisciplinary research. The following provides a few examples.

First, further studies can help us to understand the conditions under which we can expect to find large margins, transitivity, and Borda margins. From the perspective of sociologists and political sociologists, we would like to examine a variety of collective choice situations, varying in both the nature of the decision and the characteristics of the groups. We expect that decisions that involve alternatives that can be most easily ranked on a single dimension will have the strongest patterns of Borda margins. In general, we suspect that characteristics of groups that facilitate consensus (e.g., homogeneity, longer time together, and need to make a quick decision) will increase the likelihood of collective consistency.

Second, it is important to remember that "best" is a social construct that arises from a high degree of consensus. In an election, that consensus may reflect the extent to which candidates are perceived as possessing traits or attitudes that are valued by the group,[12] or it might reflect the amount of money spent on the campaign, or it might merely reflect name recognition. It is perfectly consistent with the present theory that "best" could have different meanings for different groups. It is important to understand the various social processes that produce consensus. For example, face-to-face interaction may lead to convergence on a single dimension of evaluation of alternatives, influence extending through social networks may shape a consensus, or the electronic and print media may be the primary determinants of public opinion.

Third, the economists', political scientists', and social choice theorists' quest for a method of making collective decisions often may not be as problematic as they have believed. As long as there is the type of diffuse agreement that we have described, any number of mechanisms will produce the same or similar collective preference orderings (e.g., ranking the alternatives and adding the points corresponding to the ranks).

Fourth, there are important implications for the failure as well as the success of democratic methods. Collective consistency does not occur in a random culture; without some basis of diffuse agreement, it is likely that there will be cyclical majorities that could undermine the success of democratic processes. Cross-cultural and historical studies might indicate the nature of culture and social structure that have been required for the success of democratic methods in different times and places.

Fifth and finally, we have suggested a model for the pattern of aggregation of individual choices in judgment situations that may be applicable beyond elections. For the interests of psychology and social psychology, it would be useful to study whether these patterns are found in a broad range of judgment situations that do not involve elections. For example, students could be asked to rank order several research designs to answer a particular research question. The majority preference ordering might be the ordering judged by professional researchers, or it might be an ordering reflecting the ways that student conceptions differ from those of their instructors. In either case, we expect a transitive majority preference ordering with Borda margins.

Overall, we hope to encourage further theoretical and empirical inquiry into the meanings, origins, and implications of concepts like the "general will" and the "collective conscience." We hope that such inquiry will help to clarify the characteristics of naturally occurring collectivities, and help to

understand the conditions under which it is useful and appropriate to consider collectivities as actors.

APPENDIX: Simulations

We simulated an election with 999 random voters deciding among three alternatives; for each voter, a separate random number was assigned as the value of each alternative, and these values were used to determine the individual ranking of the alternatives. The group margins of preference were determined by aggregating the preferences of the 999 voters. For that election, it could then be determined whether the group preferences were transitive and if so, whether the margins followed the Borda pattern; 590 such elections were created to determine the frequency of transitivity and Borda margins in a random culture. We found that 56 (9%) were intransitive (had cycles) and 282 (52%) of the rest had non-Borda margins.

We also wanted to determine the likelihood of transitivity and Borda margins among triples of alternatives that were embedded in larger sets of alternatives. We used the same procedure as described above to create a simulated election where the 999 voters had preference orderings among 10 alternatives. The group matrix of margins could be determined for the entire set of alternatives. Then, each triple of alternatives were examined to determine whether the group preferences were transitive and, if so, whether the margins followed the Borda pattern. So, for each simulated election, 120 triples of alternatives were examined; 57 such simulated elections were examined, including a total of 6,840 triples of alternatives. In the entire set, there were 631 (9%) intransitivities. Of the transitive triples, 3,253 (52%) had non-Borda margins. Even though the triples of alternatives within each election were not independent of one another, the frequency of intransitive and non-Borda triples was essentially the same as among independent triples.

NOTES

1. Specifically, there is a probability of .008 that no one will be correct, .096 that exactly one person will be correct, .384 that exactly two people will be correct, and .512 that all will be correct. Consequently, the probability that a majority (two or three) is correct is .896. An alternative way to reach the same conclusion is to realize that a single voter is "overruled" by a majority only when either the individual is right and the other two are wrong or when the individual is wrong and the other two are right. In this situation, the former happens with probability of .032, and the latter happens with probability of .128. Consequently, the probability of the individual alone being correct (.80) is increased by .096 (.128–.032) by using majority rule.

2. The present approach assumes that, on average, individuals are more often "correct" than not with respect to discerning the social consensus. The argument does not require that any

individuals are very competent nor that many individuals are more competent than expected by chance. As long as some individuals are more correctly informed than not (even if they are different individuals for each decision) and there is no tendency for many individuals to have systematic misinformation, the average individual competence is greater than chance, the group majority tends to be "correct," and groups will tend to make relatively clear consistent choices as described in the following sections.

The present approach also assumes the independence of individual judgments. We believe that this is a reasonable approximation to many situations. A small amount of unorganized interpersonal influence is only likely to slightly change the probability that the group majority is correct; in that case, the group majority is still very likely to be correct and the central argument of the article is unaffected. However, we should note that large-scale systematic interdependence can severely distort the whole process (e.g., by making it so that one or a few individuals effectively determine the majority choice). A fuller discussion of interdependencies is beyond the scope of the present article.

3. Condorcet recognized that the sizes of majority margins would tend to reflect the certainty with which a group makes a particular decision. He suggested that when a cycle of majority preferences arises, the pairwise preference with the smallest majority margin in the cycle is most likely to be the mistake; see Coleman (1990, 410) and Young and Levenglick (1978) for a discussion of Condorcet's method. A simple formalization shows the logic of the argument. If voter choices are random, the vote margins over several different decisions have a binomial distribution with mean zero, approximating a normal distribution for large n. In a set of judgments in which $p > .5$ is the competence of each individual, the margins have a binomial distribution with a mean of $p - (1 - p)$, again approximating a normal distribution for large n. In the latter situation, there will be fewer very small margins than in the former situation; the larger p is, the fewer very small margins there will be. For a given p, the larger the number of voters there are, the smaller the variation between decisions and the fewer very small margins there will be. When there is variation in individual competence, the formal model must be more complicated, but we believe that the distribution of margins that arises from equal competence provides a good approximation for many situations. Further consideration of a formal model is beyond the scope of the present article.

4. It is worth showing that there can be a transitive majority preference ordering for a group where the margins are not consistent with that ordering. Consider a group including three individuals with preference ordering ABC, one with CAB, and one with BAC. The group has a transitive preference ordering of ABC, but its margin of A over C (+1) is less than its margins of A over B (+3) and B over C (+3), respectively. Thus, even where majority choices are transitive, margins may not be ordered as we expect to arise from judgments.

5. In general, collective choices based on the Borda method can be dependent on "irrelevant alternatives"; for example, the choice between A and B may depend on whether C or D is also being considered. However, when the vote margins follow the pattern arising from judgments that we call "Borda margins," then the collective choices derived from the Borda method will always be the majority preference and will not be affected by which other alternatives are being considered.

6. Each of these elections used variations of the single transferable vote (STV) system, a system that was devised to select a committee that was proportionally representative of an electorate. The general approach of STV is as follows: Any candidates who receive more than a "quota" of first-place votes are selected for the committee; any excess of votes beyond the necessary quota are reallocated to the second choices of those candidates' supporters. At the same time, candidates with the least first-place votes are eliminated and the votes of their

supporters are reallocated to their next choices. The process continues until the entire committee is selected.

One advantage of this system is that it makes it very difficult for voters to benefit by misrepresenting their preference ordering. As with all voting systems over sets of three or more alternatives, circumstances can arise where individual voters can benefit from misrepresenting their preferences. However, for misrepresentations to be effective, the individuals must be very sophisticated, knowledgeable, and willing to misrepresent. We suggest that such situations are unusual and can be overlooked for the present purposes. In addition, any misrepresentations are likely to attenuate the relationships found in the data. Consequently, we believe that it is conservative to assume that the expressed preferences are accurate reflections of individual preferences.

The Electoral Reform Society (ERS) of Great Britain and Ireland is an organization dedicated to furthering the usage of STV. In addition to direct advocacy, the ERS facilitates the use of STV by serving as an impartial counter of votes in STV elections. Nicholaus Tideman obtained the data from 33 of these elections from the ERS, and the data from the other 3 elections from I. D. Hill, Clinical Research Centre, Division of Medical Statistics, Watford Road, Harrow, Middlesex HA1 3UJ, England.

For further information and documentation concerning the data, contact Nicolaus Tideman, Economics Department, Virginia Tech, Blacksburg, VA 24061; phone: (703) 951-7592.

7. For each election, the frequency of margins less than 10% that would be expected by chance was computed as illustrated in the following example with 380 voters and 10 candidates. A 10% margin corresponds with one candidate getting 55% of the vote, that is, at least 209 votes in this case. The standard error in this situation is $.5* \text{sqr}(n) = 9.75$. Thus 209 votes would be 1.95 standard errors from the mean of 190. Using a normal distribution table, the probability of a sample falling within that region is .948 by random sampling fluctuation; thus 43 of the 45 margins were expected to fall in that region.

8. As formally discussed in note 3, we expect that there will be fewer small margins when the average individual competence is higher and when the number of voters is larger. One factor that affects the competence of the voters is the complexity of the decisions; when there are large numbers of candidates, it is likely that the average competence of individuals will be relatively low for many of the pairs of candidates. While we expect all of these elections to have fewer small margins than would be expected by chance, we expect this tendency to be strongest in elections with the largest number of voters and the smallest number of candidates. There are fewer small margins than expected by chance in almost all (33 of 36) of the elections, and the data analyses clearly indicate the fewest small margins in those elections with many voters and few candidates. This is illustrated by considering the three elections that were inconsistent with our expectations. These elections each had at least 18 candidates (when only three other elections had so many candidates) and at most 91 voters (when only 13 other elections had so few voters).

9. Wherever there is a long cycle, that is, including many alternatives, there must also be several shorter cycles among those alternatives. For example, suppose there is a cycle where A beats B beats C beats D beats A. Then, either A beats C or C beats A. In the first case, there is a cycle: C beats D beats A beats D; in the second case, there is a cycle: A beats B beats C beats A. Similarly, either B beats D or D beats B, and these two must be involved in a cycle with either A or C. It is easy to see that longer cycles must include many more shorter cycles. Thus the finding that there are few short cycles indicates that there cannot be many long cycles.

10. As we indicate, Borda margins imply a perfect correlation between the *ordering* in the columns. Consequently, strictly speaking, we expect high *rank order* correlations rather than Pearson correlations. In the present situation, Pearson correlations and Spearman rank order

correlations produce very similar high values; we choose to present Pearson correlations because they are more familiar to most readers.

11. In the only two elections when the candidate with the highest Borda count was not the majority winner, that candidate was the group's unambiguous second choice. However, it is worth noting that one of the 36 elections was anomalous in several ways. Election 34 had 18 candidates and only 9 voters; the mean correlation (.78) in this election was the lowest of all the elections, and the candidate with the 12th highest Borda count was the candidate that was majority preferred to all others. Even so, there were few cycles (.7%) and high numbers of transitive triples with Borda margins (76%). It may be that the slightly weaker pattern of margins in this situation was primarily due to the small numbers of voters; with such small numbers, there is less of a tendency for some "errors" of judgment to be counteracted by others.

12. Traits and attitudes valued by the group may vary widely. In many groups, they can include experience or intelligence. However, in some groups, they could include racial bigotry while in others, they could include a desire for racial harmony. In some groups, the values might approve the special characteristics of elites while in others, the values might support the characteristics of the "common" man or woman.

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