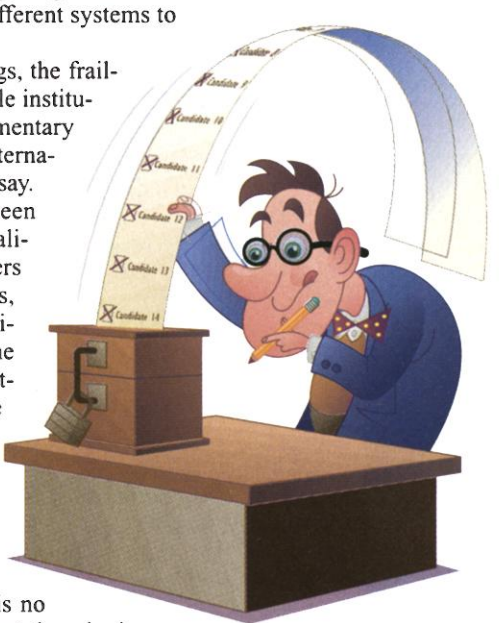
# The Science of Elections

It comes as a surprise to some that there is a science of elections. Its provenance can be traced back to the Marquis de Condorcet in 18th-century France, Charles Dodgson (Lewis Carroll) in 19th-century England, and Kenneth Arrow in 20th-century America. Since Arrow published his seminal book *Social Choice and Individual Values* 50 years ago—for which in large part he received the Nobel Memorial Prize in Economics in 1972—there have been thousands of articles and hundreds of books published on everything from the mathematical properties of voting systems to empirical tests of the propensity of different systems to elect centrist candidates.



The 2000 U.S. presidential election highlighted, among other things, the frailties of voting machines and the apparent arbitrariness of such venerable institutions as the U.S. Electoral College and Supreme Court. Political commentary has focused on these aspects, but it has paid very little attention to alternative voting systems, about which the science of elections has much to say.

Several alternative systems for electing a single winner have been shown to be far superior to plurality voting, our current system. Plurality voting, which allows citizens to vote for only one candidate, suffers from a dismaying flaw. In any race with more than two candidates, plurality voting may elect the candidate least acceptable to the majority of voters. This frequently happens in a three-way contest, when the majority splits its votes between two centrist candidates. Plurality voting also forces minor-party candidates into the role of spoilers, as we saw in 2000, which can be decisive in a close contest between two major-party candidates.

Of the alternatives to plurality voting, we recommend approval voting on both practical and theoretical grounds. Approval voting allows voters to vote for as many candidates as they find acceptable. For instance, one can approve of a minor-party favorite and at the same time vote for an acceptable major-party candidate. There is no ranking; the candidate with the most approval votes wins, ensuring that the winning candidate is acceptable to the largest fraction of the electorate.

Systems that involve ranking candidates may appear, at first blush, more appealing than approval voting. One, the Borda count, awards points to candidates according to their ranking. Another is the Hare system (sometimes called "instant runoff"), in which candidates receiving the fewest first-choice votes are progressively eliminated and their votes transferred to second choices (and lower choices if necessary), until one candidate emerges with a majority. Compared with approval voting, these systems have serious drawbacks. The Borda count fosters "insincere voting" (for example, ranking a second choice at the bottom if that candidate is considered the strongest threat to one's top choice) and is vulnerable to "irrelevant candidates" who cannot win but can affect the outcome. The Hare system may eliminate a centrist candidate early on and thereby elect one less acceptable to the majority. It also suffers from nonmonotonicity, in which voters, by raising the ranking of a candidate, may actually cause that candidate to lose.

Because approval voting empowers voters to express their political judgments more fully, it should induce more citizens to go to the polls, particularly in those early primary elections that determine the serious contenders. It allows minor-party candidates to receive their proper due, without distorting the verdict that voters render on the major-party candidates. Approval voting should also reduce negative campaigning, encouraging candidates to make more positive appeals to gain support from voters with primary commitments to other candidates. Unlike the Borda and Hare systems, approval voting can be implemented on existing voting machines and is relatively easy for voters to understand.

Is the prospect of approval voting just an academic pipe dream? Not really. It has already been used by professional science and engineering societies totaling over 600,000 members and to elect a secretary-general of the United Nations. It is now being considered by the Task Force on Election Administration of the U.S. National Commission on Electoral Reform. Perhaps best of all, it could be adopted in the United States without any constitutional amendment; any state legislature could enact the enabling statute. Isn't there a state that would like to make itself the pioneer in electoral reform?

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