Is Majority Rule the Best Voting Method?

by

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"... virtually everyone assumes that democracy requires majority rule in the weak sense that support by a majority ought to be *necessary* to passing a law. But ordinarily supporters of majority rule mean it in a much stronger sense. In this stronger sense, majority rule means that majority support ought to be not only necessary but also *sufficient* for enacting laws." Robert Dahl, *Democracy and its Critics*.

Two Questions in Democratic Theory

How should a society or nation select public office holders? How should a legislature decide which laws to enact? The casual answer to these questions might be simply: Take a vote. But there are many possible voting methods— majority rule, plurality rule, rank-order voting, and a host of others—and their relative advantages and drawbacks are not always readily apparent from casual inspection.

For several hundred years, researchers have used techniques drawn from *voting theory* (sometimes called *social choice theory*) to study such fundamental questions. And the theory has often had an appreciable effect on voting practice. In the late eighteenth century, for example, the French Academy of Sciences was so impressed by the engineer Jean-Charles Borda's mathematical analysis of the electoral method he had devised—now called rank-order voting or the Borda count—that they quickly adopted it as the method for electing new members. In recent years, voting theory has figured prominently in debates over electoral methods in such diverse bodies as the European Union, the Econometric Society, and the Federal Republic of Brazil.

In this paper we will discuss some of the classic issues and difficulties that have arisen in voting theory. We also report recent findings on a particularly celebrated voting method: majority rule. For the sake of brevity,

we shall focus on voting in *elections* (but see the concluding section for a brief discussion of the question of voting on *legislation*).

It can be argued that context matters when one tries to identify the "best" electoral method. The election of a board's chair seems inherently so different from that of a country's president that one could question whether the same rules should govern both. For example, tactical voting might play a big role if the number of voters were small; whereas, if that number were large and voting in blocs difficult to organize, individuals would have little reason to vote tactically. In order to identify good electoral methods, one should reckon with such differences. Again, for brevity, we focus here on elections involving large numbers of voters, say, at the national level. We also restrict attention to the problem of selecting a single winner from a set of candidates; such schemes as proportional representation, used to fill a whole legislature, thus fall outside our scope. Finally, we bypass the question of *who* should constitute the electorate (an important question in itself) and take the body of voters as given.

What sort of electoral method to use would be unproblematic if everybody in society shared the same preferences over candidates, i.e., they had the same *ranking*. This is because any method that is even vaguely reasonable will satisfy what we will call the *consensus principle*, which requires that if everyone in society agrees that candidate A is better than candidate B, then B will not be elected. Clearly, *all* methods that satisfy this principle would lead to the same outcome if everybody had the same ranking. And so despite the fact that there is a great profusion of such methods, it would not matter which was actually used. In reality, of course, people typically differ in their preferences. So, the consensus principle by itself will not get us very far toward identifying the right electoral method.

What Should Voters Express On their Ballots?

In many electoral systems, a voter reports only his or her favorite candidate, rather than express a ranking of all candidates. If there are just two candidates (as in referenda, where the candidates are typically "yes" and "no"), then both sorts of reports amount to the same thing. But with three or more candidates, there is a difference and it could well matter.

A case in point is the French presidential election of 2002, in which, in the first round, a voter could vote for any one of nine candidates, the most prominent being the incumbent president Jacques Chirac of the Gaullist party, the Socialist leader Lionel Jospin, and the National Front candidate Jean-Marie Le Pen. The rules dictated that the two highest vote-getters would then face each other in a runoff. In the event, Chirac finished first (with 19.9% of the vote), as expected, but Le Pen was the surprise second-place finisher (with 16.9%); Jospin— who, with Chirac, had been heavily favored to reach the runoff—finished third (with 16.2%). (Chirac then handily defeated Le Pen in the second round).

Still, despite Jospin's third-place finish, most available evidence suggests that in a head-to-head contest against Le Pen, he would have easily won . It is even fairly plausible that he could have defeated *Chirac* in a two-way match up! But the French electoral system has a serious flaw: it cannot incorporate such important information about voters' rankings. By taking account only of voters' favorite candidates, it permits "protest" candidates like Le Pen— candidates who have no real chance of winning themselves—to have an appreciable effect on the outcome of the election. Yet, as a practical matter, a voter should not usually find it much harder to rank all candidates in an

election[1] than merely indicate her favorite.   To allow for this possibility we will define an *electoral method* as a rule that determines the winning candidate on the basis of the *rankings* that voters submit.

Simple Majority Rule

The best known example of an electoral method is *majority rule*. In fact, there are quite a few variants of this method and so we will concentrate on what the voting literature calls *simple* majority rule: the winner is the candidate who would beat each opponent in a pairwise comparison. That winner may not be identifiable just by looking at voters' top choices.

To see this, let us refer again to the 2002 French election. To simplify, let us imagine hypothetically that Chirac, Jospin, and Le Pen are the only candidates and that the electorate divides into three groups. Everyone in the first group, amounting to 30 percent of the electorate, ranks Jospin over Chirac, and Chirac over Le Pen; in the second group - 36 percent of the electorate – the ranking is Chirac, Jospin, Le Pen; and in the third group - constituting the remaining 34 percent of the electorate - voters have the ranking Le Pen, Jospin, Chirac (see Table 1). If we allowed each voter to name just her *favorite* (i.e., top-ranked) candidate and adopted plurality rule [2](sometimes called "first-past-the-post"), then Chirac would obtain a plurality of 36 percent (coming from the second group), and would therefore be elected. But by examining the configuration of voters' *rankings* over the three candidates, one can see that Jospin actually commands the overwhelming majority because 64 percent of the electorate (those in the first and third groups) prefer Jospin to Chirac, and

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[1] Actually, in an election with many candidates, *compelling* voters to rank all candidates could be unduly burdensome. But for our purposes it would suffice to give a voter the *option* of ranking as many candidates as she liked; the unranked candidates would then implicitly constitute a tie for last place.

[2] Plurality rule, in which the winner is simply the candidate with the most votes, is the electoral method used in U.S. Congressional and British Parliamentary elections. It is also used to decide which candidate

66 percent (those in the first and second groups) prefer Jospin to Le Pen. So, from the majority-rule standpoint, Jospin should win. Henceforth, when referring to "majority rule," we shall mean *simple* majority rule.

One might ask whether the majority winner—the candidate who would win all pairwise competitons—would always be selected by the French electoral system, in which the two biggest vote-getters from the first round face each other in the second-round election. The answer, unfortunately, is "no," as the hypothetical example that we just examined (Table 1) illustrates. There, as in reality, Chirac and Le Pen would be the vote leaders in the first round: Chirac with 36 percent and Le Pen with 34 percent. Thus, the majority winner, Jospin, would not even make it to the runoff, as indeed he failed to do in 2002.

Notice that under simple majority rule, a voter who preferred Jospin to Chirac and knew that Le Pen had no chance of winning but wished to rank him first as a gesture of protest could do so without fear that this would knock Jospin out of the race (the analogous point can be made about a voter who preferred Al Gore to George Bush in the 2000 U.S. electorate but wished to lend symbolic support to Ralph Nader).

Majority Rule versus Rank Order Voting

All this suggests that majority rule may be more attractive as an electoral method than either plurality rule or the French two-round procedure. But, as we shall see, how it compares with *rank-order* voting is more interesting.

To set up that comparison, let us evoke the US presidential election of 2000 and imagine that there are four candidates for president named Gore, Nader, Bush, and Buchanan. Suppose there is a voter named Al, whose ranking is Gore, Nader, Bush, and Buchanan (see Table 2). Also assume that there is

gets a state's electoral votes in U.S. Presidential elections.

another voter named W with ranking Bush, Nader, Buchanan, and Gore (see Table 3). Let us imagine further that everyone in society is either like Al or like W. In fact, let us suppose that 59 percent of the electorate have Al's views and 41 percent have W's views (see Table 4). The question is: What is the *right* outcome for this distribution of voters' rankings; that is, who *should* be elected?

Under majority rule, it is clear what would happen: Gore would win in a landslide because 59 percent of the electorate (namely, all the "Al-like" voters) prefer him to anybody else on the ballot.[3] (Note: as the outcome of the 2000 election made clear, the US presidential electoral system, with its reliance on an electoral college, is in reality rather different from the electoral methods considered in this paper, but even so our analysis applies directly to the contest within any particular state.) We might ask, however, whether this outcome truly reflects the views of the electorate. Of course, that question requires us to define what a "true reflection" would be. To sharpen the question, let us now introduce rank-order voting (a method particularly popular with committees).

In rank-order voting as applied to our four-candidate example, each voter assigns four points to his or her favorite candidate, three to the next favorite, two to the next, and one to the least favorite. The points are added up for each candidate, and the winner is the candidate with the biggest total. As mentioned before, the method appears to have been invented by Jean-Charles Borda, and so the procedure is sometimes called the "Borda count." Interestingly, for the voting pattern of Table 4, the Borda count gives rise to a different outcome from majority rule. If there are a hundred voters in all, then, according to the table, fifty-nine voters place Gore first. This means that Gore will receive 236 points - 59 times 4 points - from these voters. And since 41 voters place Gore

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[3] In this particular example, plurality rule would lead to the same outcome.

last, he will receive an additional 41 points from those voters, for a grand total of 277 points. If we make the corresponding computations for the other candidates we find that: Bush receives 282 points and Buchanan 141. Strikingly, Nader ends up with 300 points, even though he appears at the top of no one's list. Instead, he is a consistent second, and that is good enough to elect him under rank-order voting.

So majority rule and rank-order voting result in strikingly different outcomes in this example. With the rankings of Table 4, Gore crushes everyone else under majority rule, but finishes only third under rank-order voting. Given this sharp contrast, what can we say about which electoral method does a better job of representing voters' views? One way to answer this question is to go back to fundamental principles. Indeed, this is the route that was followed by Kenneth Arrow of Stanford University in his 1951 monograph on voting theory, a work that continues to shape the voting literature.

Let us try to formulate the principles or "axioms" that any good electoral method *ought* to satisfy. We have already mentioned one of those axioms, the consensus principle (which voting theorists often call the *Pareto principle*, after the Italian sociologist Vilfredo Pareto, who propounded it). But this principle does not distinguish between majority rule and rank-order voting: *both* methods satisfy it.

Another important democratic principle is the idea that all voters should count equally in the voting process. This is sometimes called the "one-man, one-vote" or equal-treatment principle. To voting theorists it is called the principle of *anonymity*: who you are should not determine your influence on the election. But, as should be clear, rank-order voting and majority rule also both satisfy anonymity. Therefore they cannot be distinguished on the basis of this

principle either.

A third widely-accepted axiom dictates that all candidates should compete on an equal footing, that the rules ought not to be biased against or in favor of any of them (it should not be the case, for example, that Buchanan requires a two-thirds majority while everyone else requires a simple majority to be elected). By analogy with equal treatment of voters, this principle can be called "equal treatment of candidates;" voting theorists call it *neutrality*. But, yet again, we have identified a principle that both majority rule and rank-order voting satisfy.

According to what principle, then, do these electoral rules *differ*? The easiest way to introduce the crucial axiom that distinguishes them is to imagine what would happen in our example if Buchanan dropped out of the race, leaving an election with three candidates. Clearly, from the standpoint of majority rule, nothing would change: Gore would still win. And there is an important sense in which nothing *should* change. After all, Buchannan is deemed inferior to all other candidates by 59 percent of the electorate, and he gets the lowest point total in the Borda count. So why should this candidate who stands no chance of winning himself affect the election by his decision about whether or not to run? Indeed, under majority rule, he does *not* affect it: if Buchanan disappears, Gore still wins handily.

But let us see what happens with rank-order voting. With only three candidates, the rules dictate that a voter's favorite candidate will receive 3 points, the second favorite 2 points, and the least favorite 1 point. So, Gore now receives 218 points (3 times 60 plus 1 times 40). Similarly, Bush's new total is 182 points, but Nader now gets only 200 points. And so, the withdrawal of Buchanan means that Gore wins instead of Nader. In other words, rank-order

voting fails to satisfy the principle that "irrelevant" candidates - for example, candidates who have no chance to win - should not determine the outcome of the election by their absence or presence. This principle was named the *independence of irrelevant alternatives* by Arrow in his classic work. Simple majority rule, by contrast with rank-order voting, satisfies independence of irrelevant alternatives, not just in the above example, but in general. This is true essentially by definition—all comparisons are *pairwise* and so cannot involve irrelevant alternatives.

A Problem with Majority Rule

As matters stand in our discussion, majority rule appears superior to rank-order voting because, although both electoral systems satisfy the principles of consensus, anonymity (equal treatment of voters), and neutrality (equal treatment of candidates), majority rule alone satisfies independence of irrelevant alternatives.

Nevertheless, there is a potential problem with majority rule, which can be understood by considering yet another hypothetical case. Imagine, in an election with three candidates, that 35 percent of the electorate have ranking Gore, Bush, Nader, 33 percent have ranking Bush, Nader, Gore, and 32 percent ranking Nader, Gore, Bush (see Table 5). What would happen under majority rule with such an electorate? Notice first that 67 percent of voters rank Gore above Bush (those in the first and third groups); 68 percent rank Bush above Nader (those in the first and second groups); and 65 percent rank Nader above Gore (those in the second and third groups). In other words, no matter which candidate is chosen, at least 65 percent of voters prefer somebody else; under majority rule, there is *no* candidate who is the appropriate winner!

This possibility, called the Condorcet Paradox (or the Paradox of Voting), was identified in the late eighteenth century by Marie-Jean de Condorcet, who happens to have been a colleague (and arch-critic!) of Jean-Charles Borda—he of the Borda count—in the French Academy of Sciences.

The three rankings in Table 5 constitute a "Condorcet cycle" (the reason for the term "cycle" is that if we place Gore, Bush, and Nader on a circle, as in Figure 1, these three rankings are generated by moving around the circle clockwise, starting with each candidate in turn). As we have seen, if voters' rankings of candidates are drawn from such a cycle, then majority rule may not produce a winner. Technically, we then say that majority rule is *intransitive*.

To understand this latter concept, consider a voter who ranks Gore above Bush and Bush above Nader. It would be reasonable to expect that she will then rank Gore above Nader. Indeed, this seems a necessary property of logically coherent rankings (whether the rankings are a reflection of personal preferences or values) and is called *transitivity*. Its violation is called *intransitivity*. Now, an electoral method implicitly gives rise to a *social* ranking of candidates. Thus, if majority rule is the method, then A can be viewed as "socially ranked" above B if a majority rank A above B. The system is transitive if, whenever A is socially ranked above B, and B is socially ranked above C, then A is socially ranked above C. But the reason for imposing transitivity on the ranking produced by an electoral system is not only the demand of logical coherence, but also to ensure that there is an electoral winner. When transitivity fails - as it does in the Condorcet paradox - the outcome of the election is not clear.

It turns out that Condorcet cycles are inextricably tied to the intransitivity of majority rule. Not only can the social ranking corresponding to majority rule be intransitive when the voter's rankings include a Condorcet cycle (as the

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Condorcet Paradox exemplifies), but, as shown by Amartya Sen of the University of Cambridge, it is *only* in this case that the social ranking generated by majority rule is intransitive.

Transitivity is a principle for which rank-order voting has the edge over majority rule, because rank-order voting *always* generates a transitive social ranking. Thus, if Gore gets more points than Bush, and Bush gets more than Nader, then Gore obviously gets more than Nader. (In particular, Condorcet cycles cause rank-order voting no problem: if the electorate's rankings are given by Table 5, then Gore emerges the clear winner with 202 points to Bush's and Nader's totals of 201 and 197 respectively).

Our comparison of majority rule and rank-order voting appears to have resulted in a dead heat (see Table 6): majority rule satisfies all but one of our list of principles (transitivity), and so does rank-order voting (independence of irrelevant alternatives). This might lead us to ask whether there is some other electoral system that satisfies *all* the principles we have discussed.

That the answer is "no" was established by Kenneth Arrow, in what is now known as the Arrow Impossibility Theorem. Arrow showed that, even leaving aside anonymity and neutrality, any electoral method that satisfies the principles of consensus, independence of irrelevant alternatives, and transitivity must be a *dictatorship*; that is, the method must have the property that only a *single* voter (the dictator) matters. This happy voter's ranking determines that of society. Because a dictatorship clearly violates "anonymity," Arrow's theorem implies that no method satisfies all our principles.

Reasonable Electoral Systems

But there is a sense in which Arrow's theorem conveys too negative a message. The theorem supposes that for an electoral method to satisfy a given

principle, it has to do so regardless of what the pattern of voters' rankings of candidates turns out to be. Yet some patterns seem quite unlikely. In particular, Condorcet cycles—the bugaboo of majority rule—may not be a very serious problem in practice. After all, voters' rankings of candidates do not come out of thin air. They might, for example, derive from ideology.

Indeed, to see what implications ideology can have for majority rule, consider the continuum ranging from the political left to the right and imagine each candidate's position on this spectrum. If we move from left to right, we will presumably encounter the 2000 presidential candidates in the order Nader, Gore, Bush, and Buchanan. However, if ideology is what drives voters' views, then any voter who ranks Nader above Gore is likely to rank Gore above Bush. Similarly, any voter who ranks Bush above Gore can be anticipated to rank Gore above Nader. In particular, we would not expect a voter who both ranks Bush above Nader and Nader above Gore. But notice that in our example of the Condorcet cycle, the ranking of Bush above Nader above Gore was a crucial ingredient. In two pioneering papers published in 1943 and 1948, respectively, the late Howard Bowen and (independently and more generally) the late Duncan Black of the University College of North Wales showed that if voters' rankings are ideologically driven in the above manner (or at least, if there are not too many nonideological voters) majority rule will be transitive. This discovery made a great deal of theoretical work in political science possible because, by assuming ideological rankings over candidates on the part of voters, researchers could circumvent the Condorcet Paradox and make clear predictions about the outcome of majority rule.[4]

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[4] Of course, even if it is likely that the Condorcet Paradox will be avoided, we should still have a tie-breaking rule ready in case it does occur. One simple rule is to stipulate that if nobody obtains a majority against all opponents, then among those candidates who defeat the most opponents in pairwise

Of course, ideology may not always reduce to a one-dimensional left-right spectrum in this way. But this is only one example of a restriction that ensures transitivity of majority rule. For another, let us return once again to the 2002 French election and note that, although Chirac and Jospin led the two major parties, they did not inspire much passion among voters. It was the extremist candidate, Le Pen, who aroused people's repugnance or enthusiasm: a huge majority of voters seem to have ranked Le Pen either last or first among the three leading candidates; in other words, few ranked him second. One can argue about whether the fact that (almost) nobody ranked one of the candidates second was good or bad for France. But it was unquestionably good for majority rule!——one can show that this restriction ensures that the social ranking is transitive.

All this is to say that, in comparing electoral methods, we should take account of the fact that not all rankings over candidates are probable, or even plausible. Perhaps rankings are restricted for ideological reasons, perhaps they are restricted for other reasons; but, one way or the other, it is likely that they are restricted. In our own recent work on voting, we have been interested in comparing electoral methods under the assumption that individual voters' rankings are not arbitrary, but restricted to certain classes.

To see how we have gone about this, let us call an electoral method *reasonable* if it satisfies the principles we have mentioned: consensus, anonymity, neutrality, independence of irrelevant alternatives, and transitivity. We know from Arrow's theorem that no method is reasonable when voters' rankings are *un*restricted. So consider a restricted class of rankings. We will

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comparisons, the winner is the one with the highest rank-order score. In the example of Table 5, all three candidates defeat one opponent, and so, according to this tie-break rule Gore wins with a rank-order score of 202 points to 201 and 197 points, respectively, for Bush and Nader.

call an electoral method *reasonable for such a class* if it satisfies our five principles when voters' rankings are limited to that class. For example, majority rule is reasonable for the class of rankings derived from left-right ideology.

Our main conclusion, which takes the form of a theorem, is that majority rule is reasonable for more classes of rankings than any other electoral method. To be more precise about what we mean, consider some other electoral method and a class of voters' rankings for which it is reasonable (that is, the method satisfies all five principles when voters' rankings belong to this class). Our theorem implies that majority rule will also be reasonable for that class. It also means that we can find some other class of rankings for which majority rule is reasonable and the other electoral method is not.

So there is a precise sense in which majority rule surpasses any other possible electoral method from the standpoint of the five principles we have enunciated here: Whenever a method works well in the sense of satisfying these principles for some class of rankings, then for the same class, majority rule does too; and furthermore there must exist another class for which majority rule works well (that is, it satisfies all the principles), but the other electoral method does not.

Let us illustrate this conclusion by comparing majority rule to rank-order voting. We note first that, just as majority rule can satisfy transitivity on restricted classes of rankings (e.g., those that are ideologically driven), so can rank-order voting satisfy independence of irrelevant alternatives with suitable restrictions on rankings. Suppose, for example, that every voter in an electorate either has the ranking Gore, Bush, Nader or the ranking Bush, Gore, Nader. Notice that with three candidates, there are six logically possible rankings. So, by restricting our class to only two rankings, we have eliminated four rankings

from consideration. It is not hard to see that rank-order voting satisfies independence of irrelevant alternatives for this class. Thus, in this case, whether Bush or Gore wins a rank-order election will not be affected by Nader's decision to run or not. In fact, rank-order voting is reasonable for this class because it *always* satisfies the other principles. As the theorem implies, majority rule is also reasonable for this class. To confirm this, recall that only transitivity is potentially problematic for majority rule and that intransitivity can occur only when the class of voters' rankings includes a Condorcet cycle. Since, in our present example, voters have only two rankings, such cycles cannot occur.

Let us now add a third ranking—Gore, Nader, Bush—to the class. Majority rule is reasonable for this expanded class too, because these three rankings do not constitute a Condorcet cycle. (Condorcet cycles are generated by moving, say clockwise, around a circle of three candidates starting with different candidates, as in Figure 1. So the rankings Bush above Gore above Nader, Gore above Bush above Nader, and Gore above Nader above Bush cannot all be generated from clockwise movement around a single circle.) But it is easy to confirm that rank-order voting is *not* reasonable for this class. If, say, 25 percent of the electorate have ranking Gore above Nader above Bush, 51 percent rank Bush above Gore above Nader, and 24 percent rank Gore above Bush above Nader, it will indeed matter whether Nader is running for office. To check this, notice that if Nader does run and there are 100 voters, Gore wins with a point total of 249 to Bush's 201. But if Nader drops out, then in the head-to-head contest between Gore and Bush, Bush wins (with a Borda count of 151 to Gore's 149). Thus, as our theorem claims, there exists a class of rankings for which rank-order voting is not reasonable, but majority rule is.

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Strategic Voting

We have been supposing implicitly that when voters submit their rankings in an election they will do so truthfully. But this is not always a good assumption. To see why, refer again to Table 4. We have noted that if the electorate's rankings are given by that table, Nader will win a rank-order election, even though nobody ranks him first. But foreseeing this outcome, voters who rank Gore first may tend to downgrade Nader to third or fourth in an effort to get Gore elected. In other words, rank-order voting is highly vulnerable to strategizing.

By contrast, another benefit of (simple) majority rule is that it encourages truthful voting (as long as rankings are restricted to a class for which it is transitive). In particular, it is not a good idea, under majority rule, to place Nader below Bush if you have the ranking Gore, Nader, Bush: the stratagem gives Gore no greater a chance of beating Nader and increases the risk that Bush will be the overall winner.

Conclusion

Besides its use in elections, majority rule is commonly used by democratic legislatures as a way of voting on bills. Take, for example, the way that the two U.S. houses of Congress decide among a sequence of amendments to a bill. In the first round, the original version of the bill is pitted against the first amendment. Then, at every subsequent point, the winner of the previous round goes head-to-head with the next amendment in the sequence, the new winner being the option with more votes. Finally, after all the amendments have been considered, there is a straight up-or-down vote on the version of the bill that won in the last round (if "up," that version is adopted; if "down," the bill fails and the status quo persists). This procedure may seem a far cry from

majority rule but, in fact, may well amount to exactly the same thing. Specifically, suppose that legislators' preferences are restricted in such a way that simple majority rule is transitive (e.g., perhaps because preferences are ideologically driven). It can then be shown that the procedure results in the same outcome that would be selected if legislators simply submitted their rankings of the various versions of the bill (where "no version"—i.e., the status quo—is considered as one of the alternatives) and the majority winner is selected.

We find it reassuring that the voting method that is most often reasonable is used so widely in practice by legislatures. But we are not so happy about the way many countries go about picking their presidents. Both the 2000 U.S. and the 2002 French presidential elections were seriously affected—perhaps decisively—by candidates who had no realistic chance of winning. These candidates were able to wield influence because the elections took account only of a voter's top-ranked candidate. Our arguments show that a better electoral method would be to permit a voter to submit a ranking of candidates. The winner would then be the candidate who defeated each opponent in pairwise comparisons (in the event that there was no such candidate, a tie-breaking rule as in footnote 4 could be applied). Such a method would not be perfect—theory shows that no voting method can attain perfection—but there is a precise sense in which it is the best that we can do.

Further Reading

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30%	36%	34%
Jospin	Chirac	Le Pen
Chirac	Jospin	Jospin
Le Pen	Le Pen	Chirac

Table 1

Al's Ranking
Gore
Nader
Bush
Buchanan

Table 2

W's Ranking
Bush
Nader
Buchanan
Gore

Table 3

59%	41%
Gore	Bush
Nader	Nader
Bush	Buchanan
Buchanan	Gore

Table 4

35%	33%	32%
Gore	Bush	Nader
Bush	Nader	Gore
Nader	Gore	Bush

Table 5

Principles

Voting Methods	Consensus	Anonymity	Neutrality	Transitivity	Independence
Majority Rule	✔	✔	✔		✔
Rank-Order Voting	✔	✔		✔	
Plurality Rule	✔	✔	✔		
French two-round method	✔	✔	✔		

Table 6

Condorcet
Cycles
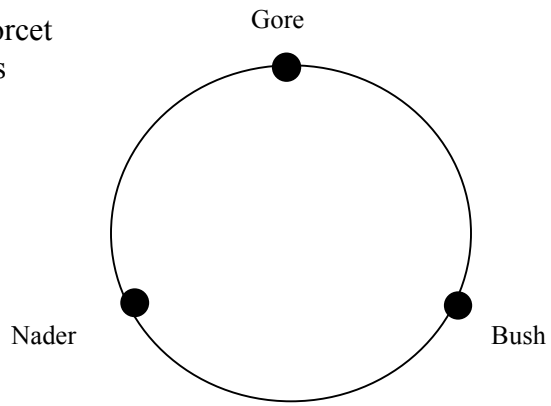
Gore

Nader

Bush

Gore	Bush	Nader
Bush	Gore	Gore
Nader	Nader	Bush

Figure 1