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Trading Places: The Effect of Voting Systems On Multicandidate Elections

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Trading Places

The Effects of Voting Systems on Multicandidate Elections

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Abstract

This paper examines effects that voting systems can have on electoral outcomes in multicandidate elections. Using ballots collected from a county Republican Party special election, we recount the votes using preference based voting systems and compare the results to the special election outcome. Relative rankings of candidates change across vote counting rules and voting systems. Because candidates trade places depending on rules, there are strong strategic implications for candidates and for those establishing the rules.

Among the numerous properties of democracy is the impact of formal rules on group decision making, especially rules pertaining to elections to select candidates. The fundamental nature of collective choice is that some choices are made not by individuals in the isolation of markets but *jointly with others*. And in order to make authoritative joint choices, rules of how those choices will be made must be adopted. Voters only get what they prefer if their side wins the election. Voters on the losing side must comply with the winning decision. Rules for determining winning and losing, then, are of utmost importance.

Deciding who wins in a democratic election process is not simple even though some rules, such as majority rule, are seemingly simple. As the Marquis de Condorcet, C. L. Dodgson (Lewis Carroll), Kenneth Arrow, Duncan Black and others have shown, majority rule faces difficulties, not the least of which is that results can be arbitrary, especially when the choice is between more than two options. If three options are offered and voters are asked to rank the three, often none of the options will be ranked first by a majority of the voters. One possibility is to consider the options in pairs but then cycling can occur with each option defeating another and none of them winning (Arrow, 1951).

There are ways out of the cycling problem and legislative bodies have developed rules and procedures that avoid them (Cox and Shepsle, 2006)), But the problem is more difficult to

avoid in general elections and it may well be that Obama can defeat Clinton, Clinton can defeat McCain, and McCain can defeat Obama—surely a perverse outcome.

An alternative to majority rule is the plurality rule--the candidate who garners the most votes among all those the voters consider is elected. Of course that can mean the winner receives less than a majority of all the votes while the losers represent a majority of all voters. Abraham Lincoln and Bill Clinton won office not with a majority but with a plurality-- a majority of voters voted for other candidates. George W. Bush did not even gain a plurality in 2000 as Al Gore received more of the popular vote. Another problem with plurality rules is that the existence of a third option can change the relative ranking of the first two options. That is, one's choices can be influenced by whether or not there are more than two options.

An effect of having more than two options is shown by the 2002 French presidential election. Incumbent president Jacques Chirac was the highest vote getter in the three-person primary race between himself, Jean-Marie Le Pen, and Lionel Jospin. Le Pen was the next highest vote getter and Jospin was third. Chirac and Le Pen then ran against each other to select the president and Chirac won. Polling data indicated that in a two-person race Jospin would have defeated Le Pen and could have also defeated Chirac. Thus, Le Pen's presence in the race changed relative rankings for Chirac and Jospin (Dasgupta and Maskin, 2008).

Another problem with voting is how to count the votes. No one who studies elections will forget Florida's "hanging," "dimpled," and "pregnant" chads in the 2000 U.S. presidential election. The state of Florida certified the vote and declared George W. Bush the winner after the U.S. Supreme Court stopped recounts ordered by the Florida Supreme Court. Independent recounts showed that Bush won in all legally requested scenarios but a statewide recount with different counting rules would have resulted in Al Gore defeating Bush. Additionally, the

National Opinion Research Center examined nine recount scenarios based on different methods of interpreting ballots and concluded that Gore would have won under five of them and Bush would have won under four of them. How the votes are counted matters.

Most voting schemes are especially blunt tools for determining intensity of preferences. Fifty-one percent might have slight preferences for a candidate while forty-nine percent strongly oppose that candidate. In this scenario the slight preferences defeat the strongly held preferences. If the electoral system measured preference intensity a different candidate would be elected.

The vast literature on these and other voting problems confirms that electoral rules and systems produce arbitrary results (see, e.g. Mueller, 2003, Chapters 6 and 7). Which counting system, for example, should have been used in Florida since the choice of rule determined the outcome? Lurking beyond the problem of arbitrary outcomes is the importance of majority rule. Should a democracy accept a leader who is opposed by a majority of voters? Is there anything special about a fifty percent plus one rule? Why not require supermajorities? What about intensely held minority preferences? All this suggests that individual preferences are distorted by the workings of the basic rules of democracy. These rules produce winners and losers but cannot be defended as rationally reflecting voter preferences. In fact, no set of rules guarantees fairness, if “fair” means “outcome neutral.”

In *The Art of Political Manipulation* (1986, 19), William Riker describes an exchange about fairness and voting rules between two professors:

It all started when Michael Levine, a professor of law, remarked to Charles Plott, a professor of economics, “Charley, I’m the chair of an agenda committee of my flying club. We’re going to decide on a new fleet. They made me chair because I’m the only lawyer in the club. But you know a lot more about voting than I do. What’s a fair way to do this?”

Plott, who had indeed made a notable mathematical discovery about voting, replied, “Well, Mike, a lot of voting schemes are fair. You ought not to care about equity as much

as whether or not some fair scheme will get the fleet you want. Most people think that voting tells you the ‘preferences of the group.’ But you know, Mike, groups don’t prefer anything. They aren’t human beings. Just because we talk about the ‘will of the people’ doesn’t mean the ‘will of the people’ exists. The choice of a group is certainly not independent of the process by which it was chosen. So there just isn’t any true preference of the group. There are various possible outcomes which the different procedures will allow the group to reach. And all these outcomes are in some sense acceptable and fair. But some are more acceptable to one person, and others are more acceptable to another. There’s no reason why the club shouldn’t choose one you like. Let’s see if we can arrange things that way.”

Plott and Levine were, in fact, successful at creating rules that were fair while predetermining the outcome. They were fair in the sense that if all voters preferred a to b , then a would have been selected; no one voter could influence the outcome more than any other voter; and no outcome got special treatment.¹ They structured the order of questions to be voted on so that, given the voters’ preferences, the voters led themselves to Levine’s preferred outcome. Riker (1986, 18) said that it was as if Plott and Levine had “pointed a bat to right field and hit the ball there, pointed the bat to left field and hit the ball there, and so on...”

One could object to this claim of fairness by noting that Plott and Levine did not disclose the information about the structure of the voting rules before the vote. But, as Riker explains (1986, 31), “Even if they had wished, they could not have constructed an outcome-neutral agenda.” Furthermore, discussing the rules of how to decide the issue would simply have meant that the decision determining the outcome would have been pushed back one more step to voting on determining how to decide. And that can lead to an infinite regress as players in the game recognize that deciding how to decide will determine the outcome, so they fight over how to decide how to decide, and so on. It is little wonder that in political science and economics departments with faculty who study voting, the battles over the voting rules are often more fierce than the battles over the actual issues before them.

In what follows we consider the choices of a county political party chair that had to decide how to select the replacement for a member of the Utah State Legislature who had resigned. The chair strongly preferred one of the three possible winners, had little information about voter preferences, and wanted to be fair. After the election he asked us if he had chosen fair rules. To answer that question we evaluate whether different rules would have produced a different ranking of candidates and draw conclusions about voting rules, voters' preferences, and election strategy.

The Election

Legislative District 5 in the Utah Legislature has been a safe Republican seat for more than forty years so the real electoral competition occurs in the County Republican Convention and primary election. Under county Republican Party rules, any candidate receiving seventy percent or more of the delegate votes at the county convention is automatically the party's candidate. Without a seventy percent vote, the top two vote getters face each other in a primary election.

In 2002, former county Republican Party chair Curt Webb challenged Brent Parker, a one-term legislator, for the District 5 seat. Webb received more votes than Parker at the county convention but Parker defeated Webb in the primary election with fifty-two percent of the vote. In March, 2003, Parker resigned from the legislature and Webb was selected to replace Parker at a special convention of the Legislative District 5 delegates.

In 2004, Webb was challenged at the county convention by Scott Wyatt, a former County Attorney. Webb received more convention votes than Wyatt but not the seventy percent required for avoiding a primary election. Wyatt defeated Webb with fifty-one percent of the primary election vote and replaced Webb in the state legislature.

Wyatt did not face a Republican challenger in 2006 but in July, 2007 he resigned from the Utah House of Representatives to become president of Snow College. Once again, the county party needed to make a mid-term replacement for Legislative District 5. Once again, a special convention of legislative districts delegates was called and, once again, Webb was selected as the replacement legislator.

For this second special convention, the county party chair, in consultation with other party leaders, chose to use a modified Instant Run-off Voting (IRV) system. IRV requires voters to rank their preferences in descending order. It had been used at a previous state Republican Party convention and had significantly reduced the time necessary for calculating the winner. When asked why he chose IRV, the chair said that saving time when counting ballots was his primary reason.

His decision was somewhat controversial. When Webb was chosen to replace Parker, the party used a two step voting process. In the first step, candidates were nominated, seconded and addressed the convention. The delegates voted for one candidate from the field of five applicants. In the second step, the two candidates receiving the most votes addressed the convention again and responded to questions. Then the delegates voted for either of the final two candidates. A number of delegates and at least one candidate argued that changing from that system to IRV was likely to confuse delegates. In addition, they objected to candidates not being able to campaign between rounds of voting. Despite these concerns, the chair used IRV as the voting system at a special election with three candidates on September 7, 2007 and, as noted above, Webb won.

Did Webb win in 2007 because of IRV? That is, would other voting and counting rules have produced a different winner? What if the convention had sent the two top vote getters to a

primary election as happens at regularly scheduled county conventions? Would Webb's opponent in that election have been determined by the voting and counting rules?

The Cache County Republican Party provided us the 2007 ballots, which allowed us to answer these questions. The preference orderings on the ballots allowed us to recount them using Plurality, Borda Count, Condorcet, Coombs, Contingent, and Bucklin voting systems. We also recounted the ballots using the rules that were announced at the convention, but not followed in the counting room.

The IRV Outcome

In an IRV system voters rank candidates from first to last, presumably² according to the voters' preferences. If a candidate is ranked first by a simple majority of voters, that candidate wins. If there is no majority winner, the candidate ranked first by the least number of voters is eliminated. The ballots ranking the eliminated candidate as first are reallocated according to the voter's stated second choice. This process is repeated until one candidate receives a majority of votes (Richie, Hill, and Kleppner, 2002: 143-157).

A sample ballot from the convention is provided below. In deference to the losing candidates, we deleted their names and refer to them as candidates A, B, and Webb. Delegates were instructed to rank their preferred candidates from one to three, "with your first choice listed as '1', second choice as '2' and third choice as '3'."³ In addition to the instructions on the ballot, the party chair announced that placing a number in *each* box was necessary as other marks could confuse the counting and invalidate the ballot. That is, truncated or incomplete ballots—those not listing each candidate as "1," "2," or "3"—would be disqualified. Eight voters ignored that instruction and only marked a vote for Webb. Contrary to the announced counting rules, the party executive committee and candidate representatives agreed to count those ballots.

(Figure 1 About Here)

When first preference votes were tallied, candidate A received 55/159 votes (35%), candidate B received 46/159 votes (29%), and Webb received 58/159 votes (37%). Candidate B received the fewest first place votes so he was deleted from the next round of counting and his votes were distributed to the other candidates according to the preference rankings marked on their ballots. That is, if a voter ranking B first ranked C second, C received that person's vote. After the votes were redistributed, candidate A received 69/159 votes (43%) and Webb received 90/159 votes (57%). Webb was declared the winner and he was appointed to the Utah House of Representatives.

Recounting the Votes

Because the ballots from the convention contained preference rankings among the three candidates we were able to determine who would have won if the convention had chosen different counting rules and different voting systems. We used two counting rules. Under the first rule (All Ballots), we used the counting rules actually used at the convention; that is, we counted truncated ballots. If a truncated ballot contained only first and second preferences, we assigned the candidate receiving no vote as third preference for that voter. If the truncated ballot had only a single preference marked, we recorded that as a first preference and did not record second or third preferences. As a result, there are some differences in total votes by rounds in our analysis. The second counting rule (Complete Ballots) disqualified truncated ballots and those with non-numeric marks. The voting systems we used were IRV, Plurality, Borda, Condorcet, Coombs, Contingent, and Bucklin. Two counting rules and six voting systems produced twelve possible election outcomes.

IRV

The preference ordering among the candidates using the convention rules was Webb-A-B. Changing the counting rules did not change the Webb-A-B outcome, it just reduced Webb's winning margin from 57% to 54%.

(Table 1 About Here)

Plurality

In single winner plurality elections each voter votes for a single candidate and the candidate with the largest share of votes is the winner (Farrell, 2001). Using plurality rules and counting all ballots, candidate A received 55/159 votes (35%), candidate B received 46/159 votes (29%), and Webb won with 58/159 votes (37%). When the truncated ballots are not counted, Candidate A wins. Candidate A receives 55 votes (35%), B receives 46 votes (31%), and Webb receives 50 (33%). The new preference ordering is A-Webb-B, compared to Webb-A-B with all ballots. Thus, just as in Florida in 2000, different counting rules produce different winners.

(Table 2 About Here)

This new result is because eight of Webb's voters cast truncated ballots ranking Webb as their first choice and not ranking any other candidates. They may have found candidates A and B unacceptable or believed they were voting strategically by only voting for one candidate.

Borda Count

In a Borda Count, voters rank candidates by allotting points that correspond with preference. In the case of three candidates, a voter's most preferred candidate receives three points, the next most preferred receives two points, and the third candidate receives one point (Emerson, 2007). The point allotments of each ballot are tallied, and the candidate with the most total points is elected. The Borda Count preference ordering under All Ballots was Webb-B-A while the

Complete Ballots ordering was Webb-A-B. Again, the counting rules produce different outcomes, but only for second and third place.

(Table 3 About Here)

Condorcet

Determining the Condorcet winner of any election requires matching every candidate in complete pair-wise comparisons and for a true Condorcet winner to emerge from the election that winner must defeat every other candidate in pair-wise comparisons (Black, 1971). We used each ballot to create three comparisons A vs. B, B vs. Webb, and Webb vs. A. Each counting rule produced the same Condorcet winner and loser and, thus, the same preference ranking—Webb-B-A.

(Table 4 About Here)

Coombs Rule

In the Coombs Rule, voters rank every candidate on the ballot. Like IRV, any candidate who is ranked first by a majority wins (Grofman and Feld, 2004: 641-659). If a winner is not determined in the first round, the candidate receiving the most *last place* votes is eliminated.⁴ The process is repeated with the continuously reduced field of candidates until one candidate obtains a majority of first place votes.

Since none of the three candidates received a majority of first place rankings, the Coombs Rule required eliminating the candidate with the most third place votes. Under each counting rule, candidate A received the most third place votes. Thus, candidate A, the Perfect Ballot plurality winner, was eliminated in the first round. In the second round, Webb received a majority of the first place votes remaining after candidate A was eliminated. The preference

ranking under each voting rule was Webb-B-A, which differs from the Webb-A-B ranking obtained under the convention IRV voting procedure and rules.

(Table 5 About Here)

Contingent Voting

Contingent voting limits counting to two rounds. Only first preferences are counted in the first round. If no candidate receives an absolute majority, all but the two candidates receiving the most first preference votes are eliminated. In the second and final round, the second place votes of those who supported eliminated candidates are distributed among the two remaining candidates and the candidate who receives an absolute majority wins (Rallings, Thrasher, and Cowling, 2002: 67-90). In a three person race the results are identical to IRV so under either counting rule our ballots produced the same result as IRV—Webb-A-B.

(Table 6 About Here)

Bucklin Method

The Bucklin method requires voters to rank-order all candidates on the ballot. Any candidate receiving an absolute majority of first place votes wins. If no majority is achieved, second choice votes are counted and added to the first choices. This process continues until an absolute majority is reached and a winner is decided (Taangepera and Shugart, 1989).

Our recount using the Bucklin method did not produce a first-round majority winner. Adding second choices under each counting method gave a Webb-B-A preference ordering, which again differs from the IRV Webb-A-B ordering. Note that candidate A receives the most first place votes in the Complete Ballots counting rule, but once second place votes are tallied, he

drops to third place. The reason for that drop is he received the most first and third place votes. Few voters ranked him second.

(Table 7 About Here)

Summary of recounts

Because Webb was ranked first or second by a majority of voters, he defeats all other candidates where second place votes are counted. In the plurality system with only complete ballots being counted, he places second. The ranking of Candidates A, B and Webb is determined by the counting rules and voting method.

(Table 8 About Here)

Reflecting Preferences

The election results differ because the various voting rules reflect voter preferences differently. Candidate A was the plurality winner under the Complete Ballots rule, but he was viewed negatively (or less positively) by more voters than any other candidate as he received the most third place votes. Webb won under all other voting rules because he received more second place votes than any other candidate. The figure below shows those preferences. Although there is very little difference between first place votes for A and Webb, their second and third place votes differ greatly as Candidate A was much more likely to be ranked third than second.⁵

(Figure 2 About Here)

Discussion

The Cache Republican election ballots confirm that voting and counting rules can matter. In this case, the winner was the same candidate in all but one of the voting systems examined. But Candidate A and B traded places across counting rules and voting systems. That outcome would have mattered a great deal if the election had been at the typical county convention where

delegates select two candidates from the available field of candidates to run against each other in a primary election. Under six of out twelve scenarios, Candidate B would have faced Webb in a primary election. In the other six scenarios, Candidate A would have faced Webb. Thus, the choice of the second candidate would have been arbitrary. The significance of that result is that in two previous primary elections Webb was defeated after having been ranked first by the convention voters.

Our findings are consistent with Brams, Hansen, and Olsen (2006) who showed that different multicandidate preference voting systems provide different electoral outcomes. Brams et al. used ballots from the 2006 Public Choice Society Presidential election which used approval voting (AV), a system in which each voter votes for (approves) as many candidates as he or she wishes and the candidate receiving the most votes wins. The Public Choice Society election produced a dead heat. Because the ballot asked voters to rank order their preferences for each candidate, the authors were able to recalculate the election results under Condorcet, Plurality, Borda count, and IRV. These four preference voting systems selected two separate winners out five of candidates. Neither of the preference winners was the AV winner.

The number of voters ranking Webb first or second was significant enough that Webb won in eleven of the twelve scenarios we considered. The slight difference in votes for A and B, as in the Public Choice Society experiment, accounts for A and B trading between second and third places depending on the voting system and counting rules.

We calculated how Candidate A could have won the election and found that if he had convinced eleven voters to rank him second rather than third he would have won under all scenarios. This finding has strategic implications. Getting voters to change their first preference may be quite difficult while the relative rankings beyond first may be more susceptible to

lobbying pressures. When second place matters, as it did in this election, strategists should ask voters to vote their true preference for number one, but to rank the strategists' candidate higher than the voters' true preference. This strategy can be especially effective if the voters are relatively indifferent about candidates other than their first choice.

We cannot help noting that the county convention system used in these elections chose Webb three times. After the first two times he faced a primary election and lost both times. The convention produced different results than a legislative district wide election. He did not have a primary challenger in 2008.

Conclusions

Since the fall of the Soviet Bloc, westerners in general and Americans in particular have promoted democracy as a replacement for the arbitrary Soviet systems that chose political leaders. And many assumed that bringing democracy to Iraq was a large step away from arbitrary systems. One of the core concepts of democracy is voting—voting to choose candidates, representatives, and policies. But election results can be arbitrary, whether the election is with few voters such as a flying club or legislative district convention or with many voters such as the presidential election in Florida.

Of course there are different degrees to the arbitrary nature of political systems. But saying that autocratic regimes produce arbitrary outcomes does not negate the fact that democratic ones do as well. Plott and Levine chose a voting system that produced the outcome Levine preferred but in that example and in all closely contested elections it is impossible to find an outcome-neutral system.

Unlike Plott and Levine, political decision-makers such as county party chairs cannot usually pre-determine election outcomes by choosing rules that guarantee their preferred

outcome wins. Plott and Levine had the advantage of knowing the preferences of the other members of the flying club. In most elections, those establishing the rules do not know how voters will rank-order candidates or policies.

What those making the rules can do is affect which candidates or kind of candidates will be the last two standing. If the chair wants to increase the chances of spatial differentiation between final candidates, he or she should choose IRV, Contingent, or Plurality because they select for candidates receiving the most *first place* votes. The other methods eliminate candidates receiving the most *last place* votes. Thus, a polarizing candidate like Cache Republican Candidate A or France's Le Pen makes it into a final election or not depending simply on the voting rules. Choosing a system that selects for polarizing candidates in a final election might be seen as giving the voters choices, not echoes, to paraphrase from Barry Goldwater's 1964 campaign slogan.

If decision makers want to provide non-polarized candidates or minimize spatial differentiation, they should choose Borda, Coombs or Bucklin because those systems select candidates receiving the most first and second place votes. Candidates located near each other in the voting space will be selected by these rules. The candidates in the final election are, under these systems, more alike than different from each other.

Works Cited

- Black, Duncan. The Theory of Committees and Elections. Cambridge: Cambridge University Press, 1971.
- Brams, Steven J., and M. Remzi Sanver. "Critical Strategies Under Approval Voting: Who Gets Ruled in and Ruled Out." Electoral Studies. 25 (2006): 287-305.
- Brams, Steven J., Michael W. Hansen, and Michael E. Orrison. "Dead Heat: the 2006 Public Choice Society Election." Public Choice 128 (2006): 361-366.
- Brams, Steven J. Rational politics : decisions, games, and strategy / Steven J. Brams. Washington, D.C.: CQ Press, 1985.
- Cox, Gary W. Making Votes Count: Strategic Coordination in the World's Electoral Systems. Cambridge, U.K. ; New York: Cambridge University Press, 1997.
- Cox, Gary W. and Kenneth A. Shepsle. 2006. "Majority Cycling and Agenda Manipulation: Richard McKelvey's Contributions and Legacy." In *A Positive Change in Political Science: The Legacy of Richard McKelvey's Most Influential Writings*. Ed. by John Aldrich, James E. Alt, and Arthur Lupia. Ann Arbor: University of Michigan Press.
- Dasgupta, Partha and Eric Maskin. "On the Robustness of Majority Rule," forthcoming , Journal of the European Economic Association, 2008.
- Diamond, Larry and Marc F Plattner. Electoral Systems and Democracy. Baltimore: The Johns Hopkins University Press, 2006.
- Emerson, Peter. Designing an All-Inclusive Democracy. Belfast, Northern Ireland: Springer, 2007.
- Farrell, David M. Comparing Electoral Systems. London: Prentice Hall, 1997.
- Farrell, David M. Electoral Systems: A Comparative Introduction. New York, New York: Palgrave, 2001.
- Gallagher, Michael and Michael Marsh. Candidate Selection in Comparative Perspective: the Secret Garden of Politics. London: Sage, 1988.
- Grofman, Bernard, and Scott L. Feld. "If You Like the Alternative Vote, Then You Ought to Know About Coombs Rule." Electoral Studies 23 (2004): 641-659.
- Katz, Richard S. A Theory of Parties and Electoral Systems. Baltimore: The Johns Hopkins University Press, 1980.

Keating, Dan.(2002, Aug) "Democracy Counts: The Media Consortium Florida Ballot Review" *Paper presented at the annual meeting of the American Political Science Association, Boston Marriott Copley Place, Sheraton Boston & Hynes Convention Center, Boston, Massachusetts* Online <.PDF> Retrieved 2008-06-10 from http://www.allacademic.com/meta/p66142_index.html

Lijphart, Arend and Bernard Grofman. Electoral Laws and Their Political Consequences. New York, New York: Agathon Press, 1986

Lijphart, Arend. Patterns of Democracy: Government Forms and Performances in Thirty-Six Countries. New Haven: Yale University Press, 1999.

Marsh, Michael. "The Voters Decide?: Preferential Voting in European List Systems*." European Journal of Political Science 13 (1985): 365-378.

Mueller, Dennis C. Public Choice III. Cambridge: Cambridge University Press, 2003)

Norris, Pippa. Electoral Engineering: Voting Rules and Political Behavior. Cambridge: Cambridge University Press, 2004.

Rae, Douglas W. The Political Consequences of Electoral Laws. New Haven: Yale University Press, 2007.

Rallings, Colin, Michael Thrasher and David Cowling. "Mayoral Referendums and Elections" Local Government Studies 28 ((2002), pp67-90.

Reilly, Benjamin. "Social Choice in the South Seas: Electoral Innovation and the Borda Count in the Pacific Island Countries." International Political Science Review 23 (2002): 355-372.

Reynolds, Andrew and Ben Reilly. The International IDEA Handbook of Electoral System Design. Stockholm: International Institute for Democracy and Electoral Assistance, 1997.

Richie, Robert, Steven Hill, and Caleb Kleppner. "Instant Runoff Voting and Full Representation: Keys to Fulfilling Democracy's Promise." Democracy's Moment. Lanham, MD: Rowman and Littlefield, 2002. 143-157.

Taagepera, Rein and Mathew Soberg Shugart. Seats and Votes: The Effects and Determinants of Electoral Systems. New Haven: Yale University Press, 1989.

Villodres, Carmen O. "Position Effects Under STV: Ireland and Malta." Representation (McDougall Trust) 41 (2004).

¹ Dasgupta and Maskin (2008) refer to these three requirements as the *Pareto property*, the *anonymity* or one-person- one vote principle, and *neutrality* respectively.

² Some, perhaps many, voters might try to “game the system” by voting strategically rather than according to their real preference rankings.

³ This is the wording on the ballot.

⁴ By contrast, IRV eliminates the candidate receiving the fewest *first place* votes.

⁵ Dasgupta and Maskin (2008) view such polarization in three or more candidate elections positively because they argue it makes majority rule generically decisive compared to plurality rule or Borda Count.

Figure 1

Cache Co. Republican Party
Legislative District 5
Special Election
September 7, 2007

Please list your preference for the candidates listed below, with your first choice listed as "1", second choice as "2" and third choice as "3". Spoiled ballots will not be accepted. Contact the Help Desk should you damage your ballot or with additional question.

☐ **Candidate A**

☐ **Candidate B**

☐ **Webb**

Table 1

IRV Outcome

Candidates	A	B	Webb
All Ballots			
Round 1	55 (35%)	46 (29%)	58 (37%)
Round 2	69 (43%)	X	90 (57%)
Complete Ballots			
Round 1	55 (36%)	46 (30%)	50 (33%)
Round 2	69 (46%)	X	82 (54%)

Table 2

Plurality

Candidates	A	B	Webb
All ballots	55 (35%)	46 (29%)	58 (37%)
Complete ballots	55 (37%)	46 (31%)	50 (33%)

Table 3

Borda Count

Candidates	A	B	Webb
All Ballots Points	292	285	337
Complete Ballots Points	295	293	318

Table 4

Condorcet

Comparisons	A vs. B	B vs. Webb	Webb vs. A
All Ballots Results	75 vs. 76	64 vs. 95	89 vs. 69
Winner	B	C	C
Loser	A	B	A
Complete Ballot	75 vs. 76	64 vs. 87	81 vs. 69
Winner	B	C	C
Loser	A	B	A

Table 5

Coombs			
Candidates	A	B	Webb
All Ballots			
3rd Place Votes	60 (38%)	50 (31%)	31 (19%)
1st Place Votes	X	46 (29%)	58 (36%)
Complete Ballots			
3rd Place Votes	62 (41%)	55 (36%)	34 (23%)
1st Place Votes	X	46 (30%)	50 (33%)

Table 6

Contingent

Candidates	A	B	Webb
All Ballots			
Round 1	55 (35%)	46 (29%)	58 (37%)
Round 2	69 (43%)	X	90 (57%)
Complete Ballots			
Round 1	55 (36%)	46 (30%)	50 (33%)
Round 2	69 (46%)	X	82 (54%)

Table 7

Bucklin Voting Outcomes

n=159

Candidates	A	B	Webb
All Ballots			
1st Place Votes	55 (35%)	46 (29%)	58 (36%)
2nd Place Votes	33 (20%)	49 (31%)	66 (42%)
1st + 2nd / # of ballots	55.3%	59.7%	77.9%
Complete Ballots			
1st Place Votes	55 (36%)	46 (30%)	50 (33%)
2nd Place Votes	34 (23%)	50 (33%)	67 (44%)
1st + 2nd / # of ballots	58.9%	63.6%	77.5%

Table 8

Electoral Outcomes by Voting Procedure

Electoral Outcome	1st	2nd	3rd
All Ballots			
Borda	WEBB	B	A
IRV*	WEBB	A	B
Coombs	WEBB	B	A
Bucklin	WEBB	B	A
Contingent	WEBB	A	B
Condorcet	WEBB	B	A
Plurality	WEBB	A	B
Complete Ballots			
Borda	WEBB	A	B
IRV*	WEBB	A	B
Coombs	WEBB	B	A
Bucklin	WEBB	B	A
Contingent	WEBB	A	B
Condorcet	WEBB	B	A
Plurality	A	WEBB	B

*Results of Actual Election

Figure 2

