Comments on Ornstein and Norman, "Frequency of monotonicity failure under Instant Runoff Voting: estimates based on a spatial model of elections," *Public Choice* (published online 17 October 2013)

By Jack Nagel
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Based on a simulation analysis that assumes a spatial model with two issue dimensions, three candidates who are boundedly rational adaptive agents, and four different distributions of voters' ideal points, Joseph Ornstein and Robert Norman (hereinafter O-N) report the following main results:

- In elections under instant-runoff voting (IRV), the frequency of one type of monotonicity failure ("upward", in which the IRV winner would lose if ranked higher by some subset of voters) ranges from 0.7% to 51%, depending on the type of voter distribution and the length of the simulation (number of periods during which the candidates adapt to hypothetical polls).

- Upward monotonicity failures are much more frequent in elections that have closer three-way competitiveness (defined by the ratio of first-place votes received by the third candidate, C, to first-place votes received by the candidate who leads after the first round, A).

- Monotonicity failures can occur only when there is a cycle or when IRV fails to elect the Condorcet winner. The voter distributions examined by O-N exhibit very few cycles, so nearly all the monotonicity failures they report are due to IRV's less than perfect Condorcet efficiency.

O-N's chief inference from these findings is that "those seeking to implement a fairer multi-candidate election system should be wary of adopting IRV."

I don't quarrel with O-N's analysis, but I contend that the inference they draw is a non sequitur. It depends on a mistake that I will dub the "failure-to-compare fallacy" (FTC). FTC is all too common among theorists who try to evaluate an electoral system in isolation.

I grant that monotonicity failures, when they occur, are an undesirable logical shortcoming. However, we know from Arrow that all electoral systems are vulnerable to one or more logical shortcomings. Consider four of IRV's competitors: Single-vote plurality (SVP), the dominant method in the U.S., often fails to satisfy independence of irrelevant alternatives (IIA), and so is vulnerable

to spoilers. [1] The same failing can be true for approval plurality (AP), though probably less frequently than with SVP. Conventional runoffs are elimination systems, just as IRV is, so they too can yield monotonicity failures. The Condorcet method reveals the existence of intransitivities and is indecisive when they exist.

Thus no electoral system can be rejected simply because it is vulnerable to one of these logical shortcomings. Electoral systems must be evaluated in comparison to alternatives, using an array of desiderata, taking into account the frequency of various failures and the severity of the consequences when those failures occur.

Within this larger perspective, how damaging are O-N's results about IRV?

In comparison to the conventional runoff, O-N's findings have no bearing on the desirability of IRV. For the three-candidate case, IRV and the conventional runoff are analytically the same, assuming that voters have strong fixed preference orderings.[2] Thus everything O-N say about IRV applies equally to the conventional runoff. (Advocates of IRV can continue to cite its administrative efficiency and avoidance of turnout falloff as reasons for preferring it over conventional runoffs.)

Comparisons to other systems are more complicated, and I have nothing so definitive to say about them. However, I can offer the following observations and conjectures:

1. When a monotonicity failure (MF) occurs under IRV, there are three possibilities that affect its practical consequences: (a) The MF may be undetected or even undetectable, given the information about preference orderings available or divulged; (b) the MF may be known after the election but not before; (c) poll information may make at least some actors aware of the potential MF before the election.

Case (a) is akin to the tree that falls in the forest where no one hears it. Ignorance is bliss.

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[1] When combined with a primary, as is typical in the U.S., SVP is also part of an elimination system, and thus is vulnerable to monotonicity failures as well as to IIA failures.

[2] The two systems may differ in their learning/persuasion properties when preferences are changeable, or when some voters start out indifferent between some pairs of candidates. They may also differ behaviorally, due to turnout fluctuations between the first and second rounds of a conventional runoff, or the different timing of appeals and bargaining for vote transfers (before the election in the case of IRV, between rounds for the conventional runoff).

Case (b), as in the Burlington election that O-N cite, may be exploited to discredit IRV--but should it? As O-N show, this monotonicity failure is tantamount to IRV's failure to elect the Condorcet winner. But we already knew that IRV is less than perfectly Condorcet efficient. Its main virtue is to guarantee not to elect the Condorcet *loser*. In both respects, IRV compares favorably to SVP, which can elect the Condorcet loser and is even less Condorcet efficient than IRV. (See the simulation results in Sam Merrill's book *Making Multicandidate Elections More Democratic.*) As for comparisons to AP, those are harder to state, because of the strategic indeterminacy of approval voting.

In case (c), supporters of one candidate may exploit the potential upward MF to vote strategically in order to change the result--i.e., some BCA voters can shift their first preferences to A or (more directly and less paradoxically) to C, so that B is eliminated first, and C survives to defeat A in the final round. But such maneuvering is benign from the viewpoint of democratic theory, because it results in the victory of the Condorcet winner. It is no worse than the common strategic desertion of a spoiler under SVP, which also may be necessary to elect the Condorcet winner and is therefore desirable. On the other hand, strategic exploitation of *downward* monotonicity failures may, as Nicholas Miller has shown, *prevent* the election of a Condorcet winner. Nevertheless, even in this scenario (which I believe is unlikely in real elections), IRV still prevents the Condorcet loser from winning. This is a major virtue compared with SVP.

2. As O-N show, monotonicity failures under IRV are rare except when the election is three-way competitive. Such races may be frequent in a simulation, but in the real world, we more often expect a Duvergerian equilibrium, in which there are only two serious candidates. IRV would thus work without difficulty for the common spoiler configuration (e.g., Nader in 2000). In this respect, IRV is similar to approval plurality, which also should work well in the Duvergerian situation (according to the very plausible Brams Poll Assumption, under which a voter will approve the more preferred of two front runners plus any candidate he or she ranks even higher). Just as IRV has a higher risk of monotonicity failures in three-way races, AP in such contests runs into its own difficulty, which I have called the Burr Dilemma (*Journal of Politics,* 2007). As I argue in that paper, however, the Burr Dilemma under AP is more likely to cause practical problems than is non-monotonicity under IRV. SVP also tends to fail when there is a non-Duvergerian equilibrium, because the strategic voting needed to elect a Condorcet winner under SVP becomes less likely when all three candidates are viable.[3]

In short, the O-N findings are interesting and valuable, but without further comparative analysis, they do not appear to me to justify any new conclusions

[3] It is possible that both IRV and AP will result in more frequent three-way races, as voters have less strategic incentive to desert a third-place candidate.

about the relative merits of IRV compared to its competitors SVP, AP, and conventional runoff. They should, however, influence the arguments made in support of IRV. In particular, advocates should be cautious about claiming monotonicity failures will always be rare under IRV. However, I would continue to assert that strategic exploitation of potential non-monotonicity will be rare, because it is so difficult to carry out successfully.

Finally, an afterword (or last word) about whether monotonicity failures are somehow worse than any other logical shortcomings to which electoral systems are vulnerable:[4] This opinion seems almost an aesthetic judgment or hard-wired response among quite a few very distinguished scholars with highly mathematical minds. Perhaps because I am not a mathematician, I do not share their reaction. Decisions about electoral systems always involve choices among imperfect alternatives. In deciding which system is better or worse in a particular context, judgments should be comparative, holistic, pragmatic, and guided by evidence about behavior as well as by theory.

[4]These include IIA/spoiler problems; violation of the later-no-harm principle; and failure to satisfy the majority principle in several guises--numerical, election of Condorcet losers, or failure to election Condorcet winners.