

Voting Fairness Criteria Handout

The Majority Criterion: An election violates the Majority Criterion if some candidate has a majority of the first place votes but loses the election.

Example: Our system of voting for president can violate the Majority Criterion (since having a majority of the popular vote does not mean having a majority of the electoral college vote and thus does not guarantee being the winner. In fact, in the 1876 presidential election, Samuel Tilden had 51% of the popular vote but lost to Rutherford B. Hayes.)

Note: In the 2000 presidential election, Gore had only a plurality with 48.4% versus Bush at 47.9% and Nader at 2.7% of the popular vote, so the Bush-Gore election did not violate the Majority Criterion. In order for the Majority Criterion to be violated, there must have been a candidate with a majority. Regardless of who wins, an election in which no one has a majority never violates the Majority Criterion.

The Condorcet Criterion: An election violates the Condorcet Criterion if some candidate is preferred head to head against every other candidate but ends up not being the winner of the election.

Note: The Pairwise Comparison method satisfies both the Majority Criterion and the Condorcet Criterion, so if a candidate has a majority of first place votes, then that candidate will also be the Pairwise Comparison winner. This also means that whenever the Majority Criterion is violated, the Condorcet Criterion is automatically violated also.

Example: The Borda count can violate the Condorcet Criterion since the Borda count winner can fail to be the Pairwise Comparison winner. For example, in the preference list below, A has a majority of first place votes, so A is the Pairwise Comparison winner, but B is the Borda count winner with 12 points, since A has only 11 points and C has 7 points. (This examples also shows that the Borda count can violate the Majority Criterion.)

Number of voters	3	2
rank		
1	A	B
2	B	C
3	C	A

Note: In an election where there is a candidate with a majority of first place votes, that candidate will be the winner under the plurality method, under the plurality-with-elimination method and under the pair-wise comparison method, but not necessarily under the Borda count method (as the example with the preference list above shows).

The Irrelevant Alternatives Criterion: An election violates the Irrelevant Alternatives Criterion if having a loser drop out of the race changes who wins the election.

Note: A typical situation in which the Irrelevant Alternatives Criterion can be violated is when there is a third-party candidate who draws support away from one of the major-party candidates, as happened in 2000 with Nader. If Nader had dropped out, many people believe that Gore would have defeated Bush.

The Monotonicity Criterion: An election violates the Monotonicity Criterion if you can turn the winner into a loser by moving the winner up the preference list on some of the ballots.

Note: Elections with run-offs can violate the Monotonicity Criterion. Moving the winner up can change who the winner faces in the run-off, with the result being that the winner ends up losing.

Example: Plurality with elimination can violate the Monotonicity Criterion. Consider the following preference list.

Number of voters	6	5	4	2
rank				
1	A	B	C	C
2	C	A	B	A
3	B	C	A	B

Then B is eliminated in round 1 since B got the fewest first place votes, so A meets C in a run-off. More voters prefer A than C so C loses. But suppose we move A up in the last column so the preference order in that column is now A, C, B. Then C loses in the first round so A meets B in the run-off, but more voters prefer B than A so A now loses. I.e., moving A up makes A lose! Thus in this election using plurality with elimination, the Monotonicity Criterion is violated.