
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.

Answer the following with “Majority Criterion”, “Condorcet Criterion”, “Monotonicity Criterion”, “Independence of Irrelevant Alternatives”, or “None”.

- (1) An election is held. A is the winner of the election. Shortly after the election, it is discovered that candidate A had a criminal record, and therefore was not eligible to be in the election. Candidate A is eliminated from all of the ballots and the ballots are counted again. In the recount, candidate C is declared the winner. The outcome of this election violates which one of the fairness criteria?

- (2) An election is held. A is the winner of the election. Shortly after the election, it is determined that candidate B (who lost the election) had accepted illegal campaign contributions, and therefore was not eligible to be in the election. Candidate B is eliminated from all of the ballots and the votes are counted again. In the recount, candidate C is declared the winner. The outcome of this election violates which one of the fairness criteria?

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- (3) Consider a School Board Election with 4 candidates: Adams, Bond, Carter, and Dunning.

Votes	10	7	5	7	4
1st	A	D	B	C	B
2nd	C	B	C	D	C
3rd	B	A	A	A	D
4th	D	C	D	B	A

- (a) If we use Plurality with Elimination, who gets eliminated first?

- (b) Who wins Plurality with Elimination?

- (c) Carter drops out of the election, leaving the following preference schedule of votes.

Votes	10	7	5	7	4
1st	A	D	B	D	B
2nd	B	B	A	A	D
3rd	D	A	D	B	A

Now who gets eliminated in Plurality with Elimination and who wins?

(d) Does the Plurality with Elimination Method satisfy or fail the IIA Criterion?

- (4) Recall the vote taken by a draft committee for newest NFL expansion team, the Lexington UKer's. The five candidates they are trying to rank for the draft are: Allen, Byers, Castillo, Dixon, and Evans. This election was decided by way of Pairwise Comparisons.

Number of Voters	2	6	4	1	1	4	4
1st	A	B	B	C	C	D	E
2nd	D	A	A	B	D	A	C
3rd	C	C	D	A	A	E	D
4th	B	D	E	D	B	C	B
5th	E	E	C	E	E	B	A

Note: You decided on Voting Day 4 worksheet that Allen won the Pairwise Comparison election. But wait!! Castillo failed the team physical, and thus will not be considered. After removing Castillo from the election, the new preference schedule is given here:

Number of Voters	2	6	4	1	1	4	4
1st	A	B	B	B	D	D	E
2nd	D	A	A	A	A	A	D
3rd	B	D	D	D	B	E	B
4th	E	E	E	E	E	B	A

- (a) Complete the table of Comparisons and determine the new winner of the draft pick.

Number of Voters	Votes	Winner/Points

- (b) Does the Pairwise Comparison Method satisfy or fail the IIA Criterion?

- (5) Arrow's Impossibility Theorem tells us that there is in fact no fair method of voting in elections with more than two candidates. Show that this is true by filling in the table, answering the question, "Does this method satisfy the given Fairness Criterion?"

Hint: MJ, CO, and MO you can pull from your previous notes/worksheets, and IIA you can fill in using today's notes and worksheet.

Method	MJ	CO	MO	IIA
Plurality				
Borda Count				
Plurality with Elimination				
Pairwise Comparisons				