

**Gehrlein, William V.****Condorcet's paradox.** (English) Zbl 1122.91027

Theory and Decision Library. Series C: Game Theory, Mathematical Programming and Operations Research 40. Berlin: Springer (ISBN 978-3-540-33798-0/hbk; 978-3-642-07035-8/pbk; 978-3-540-33799-7/ebook). xi, 289 p. (2006).

The Marquis de Condorcet first published his celebrated paradox – that pairwise majority rule need not lead to a winner – in 1785. Since then, his paradox has spawned more than 400 books and articles, found in the references section of this monograph, which collects all known mathematical results. Among the highlights of this delightful work: (1) it spells out the original dispute between Borda and Condorcet, which persists as a theme of social choice theory today; (2) it gives convincing real world cases of the paradox, among them the US presidential election of 1860 – Lincoln wins only if plurality rule is used; (3) it gives computable formulae for the probability of the paradox occurring under a wide variety of assumptions on the distribution of voters' preferences; (4) these calculations are performed for the cases of 3 and 4 alternatives, with results recorded in quite illuminating tables; (5) limiting results for large numbers of voters are also obtained; (6) the vastly different behavior of the limits, for even (odd) numbers of voters is highlighted.

To give the flavor of the results, my favorite is contained in Table 3.2 (p. 74), where we see that the probability of a Condorcet winner existing in a large electorate is .9375, when preferences obey the impartial anonymous culture condition. This limit is achieved monotonically from above on the odd numbers, starting with 3, and the convergence is very fast. So the probability of Condorcet's paradox in this case is .0625.

All that is known about Condorcet's paradox can be found in this comprehensive study.

Reviewer: Roy Gardner (Bloomington)

**MSC:**

[91B12](#) Voting theory

[91-02](#) Research exposition (monographs, survey articles) pertaining to game theory, economics, and finance

[91B14](#) Social choice

Cited in **30** Documents**Keywords:**

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