

# 1000-Word PHILOSOPHY

AN INTRODUCTORY ANTHOLOGY

[1000wordphilosophy.com/2022/07/20/condorcets-jury-theorem/](https://1000wordphilosophy.com/2022/07/20/condorcets-jury-theorem/)

## Condorcet's Jury Theorem and Democracy

Author: Robert Weston Siscoe

Category: [Social and Political Philosophy](#)

Word Count: 999

Suppose that a majority of jurors decide that a defendant is guilty (or not), and we want to know the likelihood that they reached the correct verdict.

The French philosopher Marquis de Condorcet (1743-1794) showed that we can get a mathematically precise answer, a result known as the "Condorcet Jury Theorem."<sup>[1]</sup>

Condorcet's theorem isn't just about juries, though; it's about collective decision-making in general. As a result, some philosophers have used his theorem to argue for democratic forms of government.

This essay explains Condorcet's theorem and how philosophers have used it as an argument for democracy.

### 1. Condorcet's Jury Theorem

Condorcet's theorem depends on a few assumptions.

First, that jurors reach their verdicts independently: each examines the evidence and makes a decision on their own.

Second, that jurors are competent: more likely than not to choose the correct verdict. We can pick any percentage over 50%, so let's assume that all of the jurors have, say, a 60% chance of getting the right answer.

These assumptions enable us to calculate the probability that the majority will choose the right verdict.<sup>[2]</sup>

If we have one juror, the probability of a majority selecting the right verdict is 60%. If we have three jurors, the probability of a majority selecting the right verdict rises to 64.8%.

How is this calculated? There are four possible ways for the majority to get the right answer. Because these possibilities are mutually exclusive, we can find the probability that one of those four would happen by finding the probability of each possibility and adding them together:<sup>[3]</sup>

Possibility 1: Jurors 1 and 2 are right and Juror 3 is wrong,  $60\% \times 60\% \times 40\% = 14.4\%$

Possibility 2: Jurors 1 and 3 are right and Juror 2 is wrong,  $60\% \times 40\% \times 60\% = 14.4\%$

Possibility 3: Jurors 2 and 3 are right and Juror 1 is wrong,  $40\% \times 60\% \times 60\% = 14.4\%$

Possibility 4: All the Jurors are right,  $60\% \times 60\% \times 60\% = 21.6\%$

Adding up these probabilities gives us 64.8%.<sup>[4]</sup>

Notice the probability of a correct verdict with three jurors is higher than with one juror: the more jurors we have, the more likely it becomes that a majority will choose the correct verdict. So, if we have 25 jurors, the chance that a majority selects the right verdict rises all the way to 84.6%!<sup>[5]</sup> In fact, so long as each juror is more than 50% likely to get the right verdict, as we add more jurors, we get closer to a 100% chance of a majority reaching the correct verdict.<sup>[6]</sup>

### 2. The Jury Theorem as an Argument for Democracy

There are many similarities between Condorcet's Jury Theorem and the voting behavior of citizens in an ideal democracy. Because of these similarities, philosophers have used the Theorem to argue that democracies are effective at choosing the best political candidates and policies.

First, just as jurors each choose a verdict, democratic voters each make independent decisions in voting, in many cases by casting secret ballots.

Second, in the courtroom, lawyers present the evidence to the jurors, while in democracies, public institutions take measures to help voters make good decisions, with schools teaching students about governmental processes and news sources informing citizens about political candidates and policies. So in an ideal democracy, voters are competent and informed, with a better than 50% chance of choosing the best politicians and policies.

An important difference between juries and democracies, however, is that voting takes place with

a very large number of citizens. Even smaller countries have far more voters than 25 jurors so, if all of Condorcet's assumptions hold, democracies would choose the best candidate by majority vote almost 100% of the time.<sup>[7]</sup>

### 3. Criticisms

Of course, most people think that democracies often don't choose the best. Does this mean that this argument for democracy is a complete failure?

No, but it does show that we need to look more carefully at the differences between Condorcet's Jury Theorem and actual democratic voting to see if a similar, weaker argument might still be successful.

First, in the jury case, there is a correct and an incorrect verdict: either guilty or innocent. In voting, however, the choices are not just correct or incorrect. Particular candidates or policies might be less effective, but they are not 'correct' or 'incorrect' in the way a guilty verdict can be.

This difference can potentially be fixed. We could think of voters as choosing, not just right and wrong candidates and policies, but better and worse ones. If voters are more likely than not to choose the best, then we can still apply the Condorcet Jury Theorem to democracy.<sup>[8]</sup>

Second, political problems are usually more complex than court cases. Even if jurors can decide whether a defendant has committed a crime, it is more challenging to choose the best social, economic, or immigration policy, much less choose all of them at the same time by voting for a specific politician's entire platform.

This calls into question whether democratic voters really are able to choose the best option over 50% of the time. This difference is much more difficult to fix, as it would be very demanding for citizens to become experts in all of these areas.<sup>[9]</sup>

Finally, even though citizens cast votes independently, they rarely reach decisions independently. In court cases, care is taken to prevent the jury from being biased by talking to family or reading outside news sources.

In democracies, though, isolating individuals in these ways is not feasible. Furthermore, it is not clear this is a difference we would want to fix. Totalitarian regimes are notorious for limiting the political information that citizens receive, whereas

democracies are praised for facilitating a free exchange of ideas.<sup>[10]</sup>

### 4. Conclusion

Some philosophers have claimed that Condorcet's Jury Theorem can provide a defense of democracy. The many differences between the setup of Condorcet's Theorem and democracies make it clear that further arguments are needed to show that, despite these differences, democracies would still regularly choose the best.

### Notes

[1] See Marquis de Condorcet (1785).

[2] Condorcet's Jury Theorem does not apply to all jury decisions. The United States, for example, does not allow decisions in criminal cases to be decided by majority vote, requiring that the jurors reach the final verdict unanimously. Similarly, the jurors do not judge independently; they confer with each other and presumably influence each other's judgments.

[3] In this case, we can simply multiply the individual probabilities in each possibility (for example, as in  $60\% \times 60\% \times 40\%$ ), because we're assuming that the jurors' decisions are independent of each other. And we can add together each of the four possibilities to reach a final probability that at least one would be true, because the possibilities are mutually exclusive: no two can be true at the same time, because each is inconsistent in some way with all three other possibilities. For more, see [The Probability Calculus](#) by Thomas Metcalf.

[4] More generally, we can use the formula -

$$\sum_{i=m}^N \left( \frac{N!}{(N-i)!i!} \right) (p)^i (1-p)^{N-i}$$

- where "N" is the quantity of voters, "m" is the quantity of voters needed to count as a majority, and "p" is the probability that an individual voter will reach the correct decision.

[5] To find the probability of getting the right verdict via majority vote for any number of jurors and levels of competency, you can use this link. In the associated site (Wolfram Alpha n.d.), you can see that "3" has already been entered for the total quantity of jurors, "2" has been entered for the quantity of jurors needed to achieve a majority, and "0.6" has been entered for the probability per juror of reaching the

correct verdict, but you can change the numbers to run other calculations. For example, if each juror is 0.55-probable to reach the correct verdict, there are 11 jurors, and therefore 6 required for a majority, replace the “3” with “11,” the “2” with “6,” and the “0.6” with “0.55” throughout.

[6] Think of it like this. It is difficult to tell if a coin is fair after only a couple flips. It is possible that it lands heads on the first two flips, making it look like it is unfair. However, the more times you flip a fair coin, the more and more likely it is that it will come up heads about 50% of the time. So having more flips is a good way to reveal the true odds of the coin landing heads. Likewise, if voters are 60% likely to get the right answer, it might be difficult to tell that after only a few voters, but adding more voters makes it more and more likely that they will get the right answer about 60% of the time, ensuring that a majority picks the correct verdict.

[7] Democratic voting often includes more than two choices. With the jury, there were just two options – guilty and not guilty. At the ballot box, though, voters might have to choose between many different politicians and policies. This difference can potentially be fixed. Governments could require that all ballots only offer two choices, and some philosophers have argued that the Condorcet Jury Theorem can work with multiple options, just so long as voters are more likely to pick the correct alternative than they are each of the incorrect options. See Goodin and List (2001).

[8] In fact, the Theorem works with any particular property when one outcome has the property and the other lacks it. For example, if one politician will help the poor more than the other, and each voter has a 51% chance or greater to select the politician who will help the poor more, then Condorcet’s Theorem shows that, as we add more and more voters, it becomes more and more likely that voters will select the politician that will assist the poor more effectively.

[9] Section 4, “Political Knowledge, Morality, and Blame,” of Thomas Metcalf’s [Ethics and the Expected Consequences of Voting](#) briefly reviews evidence to believe that at least most Americans have relatively little politically-relevant knowledge: they are far from experts on which political policies and candidates are likely to be best.

[10] For an overview of defenses of democracy that are based on the sharing and discussing of reasons

for various politicians and political policies, see Min and Wong (2018).

## References

List, Christian and Robert Goodin. (2001), “Epistemic Democracy: Generalizing the Condorcet Jury Theorem.” *Journal of Political Philosophy* 9(3): 277–306.

Marquis de Condorcet. (1785). *Essay on the Application of Analysis to the Probability of Majority Decisions*.

Min, John and James Wong. (2018). “Epistemic Approaches to Deliberative Democracy.” *Philosophy Compass* 13(6).

Wolfram Alpha. (N.d.). *WolframAlpha*. <https://www.wolframalpha.com/>

## Related Essays

[Ethics and the Expected Consequences of Voting](#) by Thomas Metcalf

[Free Speech](#) by Mark Satta

[John Rawls’s “A Theory of Justice”](#) by Ben Davies

[The Probability Calculus](#) by Thomas Metcalf

## About the Author

Wes Siscoe is a Postdoctoral Fellow at the University of Notre Dame with the *Virtues and Vocations* project, helping faculty members integrate virtue education into their courses. He received his PhD from the University of Arizona, and his research revolves around several themes – rationality, language, and virtue – and their importance for accounts of human excellence and achievement. [WesSiscoe.com](http://WesSiscoe.com)

*Follow 1000-Word Philosophy on [Facebook](#) and [Twitter](#) and subscribe to receive email notifications of new essays at [1000WordPhilosophy.com](http://1000WordPhilosophy.com)*