

# Judge : Don't Vote !

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Workshop: New Developments in Judgment Aggregation and  
Voting Theory  
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- 1 The Thesis
- 2 Voting Practice
- 3 Majority Judgment

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- The **theory** which results is *inconsistent* and *contradictory*.



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- *Arrow's paradox*: with at least three candidates, it is possible that  $A$  wins, but that when  $C$  withdraws and the preferences remain the same,  $B$  defeats  $A$ .

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Gibbard-Satterthwaite's impossibility theorem: There is no rule for amalgamating any set of individual rank-orders into society's rank-order that is unanimous, non-dictatorial and strategy-proof.
- Incompatibility theorem: There is no rule for amalgamating any set of individual rank-orders into society's rank-order for which the first place candidate is necessarily the winner.

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$$1 \text{ inch} + 1 \text{ foot} + 1 \text{ meter} = 3.$$

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*Range voting*—scores are given to candidates in a scale of  $[0, 100]$  and they are ranked by their total or average scores—is meaningless because scores have no definitions and the scale is not an interval scale.

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## Theorem

*An impartial method of ranking avoids the Arrow and Condorcet paradoxes if and only if rankings depend **only** on competitors' grades (not who gave them).*

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- G. W. Bush elected in 2000: had Nader not been a candidate in Florida, the state would have been carried by Gore, and Gore would have won with 291 electoral votes to Bush's 246.

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19,88%	16,86%	16,18%	6,84%	5,72%	5,33%

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- Chirac's 82.2% in second round means little and in nothing does it measure the electorate's wish for him to be elected (80.1% did not vote for him in first round).

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**Democracy is denied by the very system that defines it!**

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Aubry	Le Pen	Sarkozy	Bayrou	Borloo	Joly	Mélenchon
21.7%	20.6%	19.1%	8.5%	7.8%	7.4%	4.2%

Villepin	Besancenot	Chevènement	Dupont-Aignan	Arthaud
3.7%	2.9%	1.9%	1.4%	0.8%

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- Since polling error of 2 to 3% error: any of three could be eliminated (including the electorate's real choice).
- Three major, nine very minor candidates emerge.
- Obvious strategies of Aubry and Sarkozy: multiply candidacies in opposing camp, then call for “useful” votes.

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- Aubry comfortably defeats both Le Pen and Sarkozy, yet she could be eliminated in the first round!

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56.0%	44.0%

Sarkozy	Le Pen
63.3%	36.7%

- Le Pen defeated overwhelmingly by either Aubry or Sarkozy, yet she survives the first round!
- Aubry comfortably defeats both Le Pen and Sarkozy, yet she could be eliminated in the first round!

Why does this happen?

# Majority voting

Question 2: “If the **second round** of the 2012 presidential elections were to be held next Sunday, for which of the following candidates would you most likely vote for?”

Aubry	Le Pen
63.2%	36.8%

Aubry	Sarkozy
56.0%	44.0%

Sarkozy	Le Pen
63.3%	36.7%

- Le Pen defeated overwhelmingly by either Aubry or Sarkozy, yet she survives the first round!
- Aubry comfortably defeats both Le Pen and Sarkozy, yet she could be eliminated in the first round!

**Why does this happen?** In casting one vote for one candidate, a voter reveals *absolutely nothing* about her opinions concerning the others ... nor, indeed, about the one candidate for whom she voted.

- 1 The Thesis
- 2 Voting Practice
- 3 Majority Judgment



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- Assigns candidates final grades – their **majority-grades** – on the basis of their sets of grades.
- Ranks all candidates – the **majority-ranking** – according to their majority-grades.
- With 12 candidates majority voting allows 13 different expressions of opinion; with 12 candidates and 7 grades MJ allows more than 13 **billion** different expressions of opinion.

# Majority Judgment (MJ): Ballot

## Ballot: Election of the President of France 2007

*To be president of France,  
having taken into account all considerations,  
I judge, in conscience, that this candidate would be:*

	Out- standing	Excel- lent	Very Good	Good	Accept- able	Poor	to Reject
Nathalie Arthaud							
Olivier Besancenot							
Jean-Luc Mélenchon							
Eva Joly							
Martine Aubry							
Jean-Pierre Chevènement							
Francois Bayrou							
Jean-Louis Borloo							
Dominique de Villepin							
Nicolas Sarkozy							
Nicolas Dupont-Aignan							
Marine Le Pen							

Check one single grade in the line of each candidate.  
No grade checked in the line of a candidate means to Reject the candidate.

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Poll's question 3: vote with majority judgment.

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7.4%	Joly	3.2%	4.7%	7.4%	14.5%	20.3%	19.0%	30.9%
21.7%	Aubry	8.2%	12.9%	17.0%	12.6%	19.6%	11.4%	18.4%
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Borloo's is **Acceptable**:

- a majority of  $2.2 + 6.2 + 15.3 + 22.3 + 19.6 = 65.6\%$  believes he merits at least *Acceptable*
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Aubry's is **Good**:

- a majority of 50.7% believes she merits at least *Good*
- a majority of 62.0% believes she merits at most *Good*



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Majority judgment ranking	Above majority-grade	The majority-grade	Below majority-grade	Majority voting ranking
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The *majority-gauge*:  $(p, \alpha \pm, q)$ . Majority judgment resists strategic manipulation.

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- It eliminates the center, favors the major parties of right or left, gives too much importance to extremes.

# Majority Judgment (MJ): Properties

- Majority judgement takes into account **all of a candidate's grades**.
- Majority voting takes into account only a hodgepodge mixture of supposedly favorable opinions.
- Some say MJ favors the center: not so in theory or practice.
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- It eliminates the center, favors the major parties of right or left, gives too much importance to extremes.
- Borda and Condorcet methods hugely favor center, penalizing major parties of left and right.



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Mathematical arguments and experimentation establish the validity the claims.

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Not surprisingly, challenging a paradigm that has stood for centuries has provoked attacks :

- ❶ Majority judgment is not Condorcet-consistent.
- ❷ It admits the “no-show paradox.”
- ❸ It is nothing new: only the old welfarism approach to social choice.
- ❹ Plus the usual trivial academic nitpicking and backbiting.

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A highly artificial example: **1 judge alone** determines  $X$ 's majority-grade to be any in  $[4, 12]$ ,  $Y$ 's any in  $[8, 16]$ .

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True—**MJ is not Condorcet consistent**—but neither are approval voting, Borda, range voting, first-past-the-post, and two-past-the-post.

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But *should* the new judge stay at home? In both cases she sees no great difference between  $X$  and  $Y$  and is perhaps more interested in seeing their grades come closer to those she gives (which happens).

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- The only methods that avoid the no-show paradox are point-summing methods (such as range voting)... and they are at once meaningless and the most manipulable of methods.

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In fact, the only substantive area in common between the welfarist and majority judgment models is meaningfulness: and the measurement theorists had found those results before the welfarists.

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**In a real application more than formal mathematics is important.**

# References

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To vote in the French Socialist primaries with majority judgment :

**Slate.fr (type “jugement majoritaire”)**