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O Voto Negativo atenua a Polarização?
Nuances, Simulações e Estratégias

Clovis Belbute Peres

Seminário de Política Econômica II

Brasília, DF, nov./2025

Contexto

Voto pelo mundo

País / Região	Sistema(s) típico(s)
US Estados Unidos	Voto pluralitário (first-past-the-post); segundo turno em algumas cidades; voto preferencial instantâneo (IRV) em alguns municípios
GB Reino Unido	Pluralitário (FPTP); voto único transferível (STV) em algumas regiões
FR França	Maioria em dois turnos
DE Alemanha	Sistema proporcional misto (voto distrital + lista partidária)
AU Austrália	Voto preferencial instantâneo (IRV) para a Câmara; voto único transferível (STV) para o Senado
IE Irlanda	Voto único transferível (STV)
BR Brasil	Dois turnos para cargos majoritários; proporcional de lista aberta para cargos legislativos

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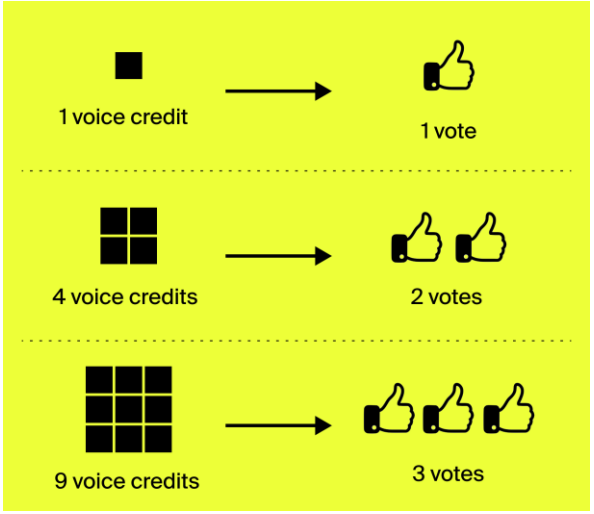
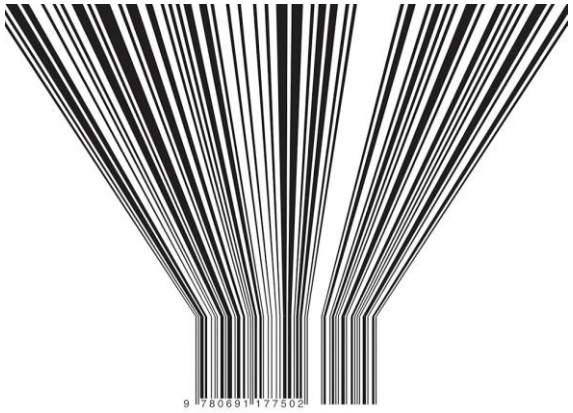
ADAM ROGERS SCIENCE APR 16, 2019 7:00 AM

Colorado Tried a New Way to Vote: Make People Pay—Quadratically

The state legislature used a method that's designed to capture the intensity of a voter's preference as a way to fix some of traditional voting's big problems.





https://www.radicalxchange.org/wiki/quadratic-voting/

Negatividade no processo eleitoral

NEGATIVITY IN POLITICAL PERCEPTION

Richard R. Lau

The tendency for negative information to have more weight than equally extreme or equally likely positive information appears in a variety of cognitive processing tasks, but has rarely been documented empirically in politics. This paper provides evidence for two types of negativity effects in electoral behavior: negativity in the formation of impressions (of Humphrey and Nixon in 1968, of McGovern and Nixon in 1972, and of Carter and Reagan in 1980), and negativity as a consequence of impressions (in the 1974 and 1978 congressional elections). Both post hoc rationalization and the nonequivalence of the positive and negative information were examined and ruled out as artifactual explanations for these results. Discussion centered around two possible explanations for negativity, a cost-orientation hypothesis (which holds that people are more strongly motivated to avoid costs than to approach gains) and a figure-ground hypothesis (which holds that negative information stands out against a general positive background).

*Two Explanations for Negativity Effects in Political Behavior**

Richard R. Lau, *Carnegie-Mellon University*

Evidence is provided for two different types of negativity effects in political behavior, a perceptual "figure-ground" negativity based on the greater salience of negative information in a largely positive world, and a motivational "cost orientation" negativity based on the survival value of avoiding costs rather than approaching gains. It is argued that the perception of presidential candidates is affected by both types of negativity effects, but that negativity in congressional elections is based solely on perceptual processes. The implications of these two different types of negativity effects for the future of American politics are discussed.

LAU, R. R. Negativity in political perception. *Political Behavior*, v. 4, n. 4, p. 353–377, dez. 1982. ISSN 1573-6687. Disponível em: <https://doi.org/10.1007/BF00986969>.

LAU, R. R. Two explanations for negativity effects in political behavior. *American journal of political science*, p. 119–138, 1985. Publisher: JSTOR. Disponível em: <https://www.jstor.org/stable/2111215>.

Primeiras experiências ...

- Brams & Fishburn (1983) → primeira axiomatização do “approval voting”

- “The election reform of the 20th. Century” (Brams, 1980).

- (CAV) - “Indeed, I do not know of any other voting method which attracted so much scholarly attention during the first decade since it was first proposed” (Felsenthal, 1989).

> Because negative voting gives voters greater opportunity to register their preferences, it is really not surprising that a negative voting strategy may dominate positive voting strategies in particular situations. What is surprising is that this property has not been recognized before, especially since allowing voters to cast negative

Brams, 1977

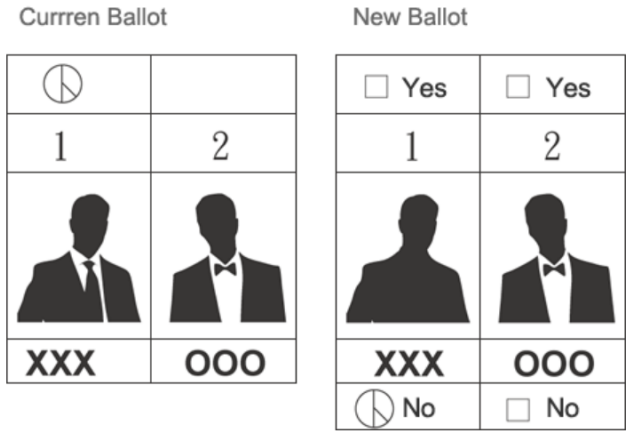
Renascimento ...

負數票協會
Negative Vote Association

ABOUT US | WHAT IS NEGATIVE VOTE | SIGN PETITION | RELATED ARTICLES

About Us

Negative Vote Association is a non-profit organization registered in Taiwan.



(Cham, 2018)

Document

Prêts pour la “démocratie intelligente” ?

Je propose les règles suivantes pour le système à deux votes :

1. *La règle du Pro net.* Traduit de manière arithmétique, cela donne : Pro nets = Pro-anti. Si A obtient 51 % de pro et 31 % d’anti, alors 51 % - 31 % = 20 % de Pro nets. Et si, dans le même temps, B obtient 41 % de pro et 11 % d’anti, alors 41 % - 11 % = 30 %. Ici, c’est B qui a gagné.

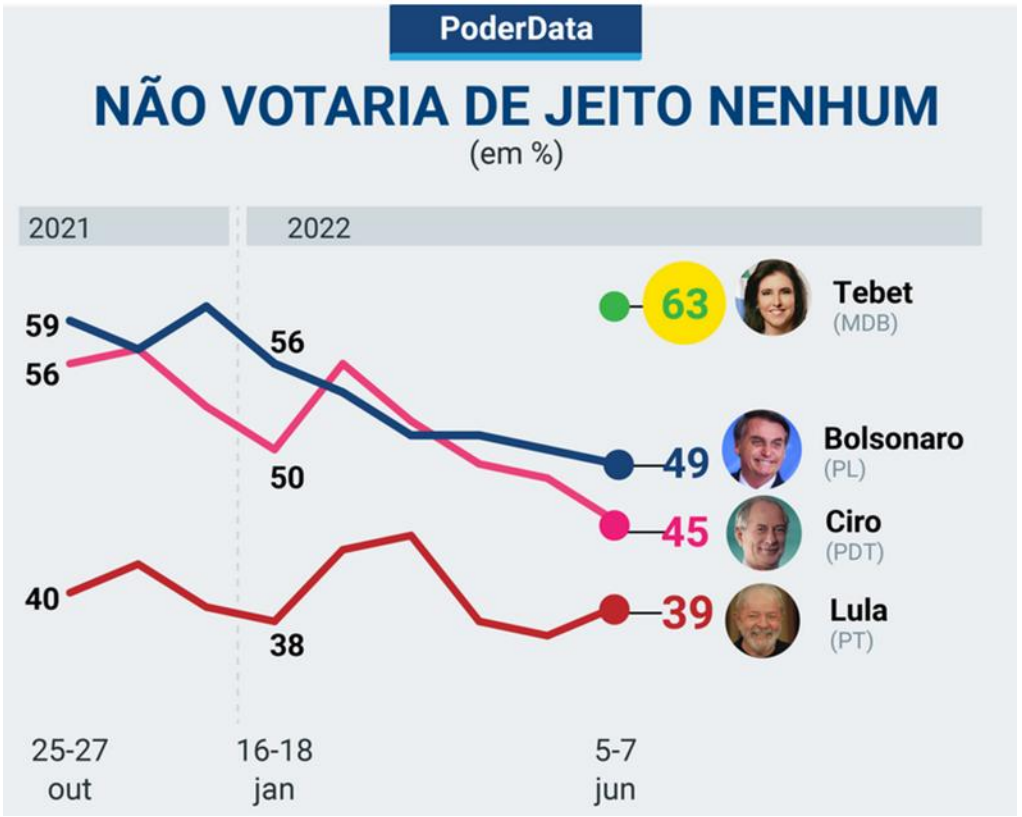
2. *La règle de la majorité conditionnelle.* Si A et B ont le même Pro net, la proposition qui recueille le plus de votes pro l’emporte.

(Zhao, 2023)

Voto Negativo x Polarização?

PoderData: Tebet é mais rejeitada que Lula, Bolsonaro e Ciro

63% declaram não votar na emedebista "de jeito nenhum". Lula é rejeitado por 39%, Ciro, 45%, e Bolsonaro, 49%



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Nuances e Simulações

Negative Voting / Balanced Voting / IRBV / CAV / EV / AWAO / Net Approval / Best-Worst / Approval-Disapproval (...)

WP 1729 – October 2017

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How voters use grade scales in evaluative voting

Antoinette Baujard, Frédéric Gavrel, Herrade Igersheim, Jean-François Laslier, Isabelle Lebon

Table 3 – Average scores and ranking, for the different voting rules.

Scale	AV		EV(0,1,2)		EV(-1,0,1)		EV21	
	Ave.	Rank	Ave.	Rank	Ave.	Rank	Ave.	Rank
Hollande	.49	1	.94	1	.14	1	9.45	1
Sarkozy	.40	2	.85	3	-.10	4	7.72	4
Bayrou	.39	3	.91	2	.11	2	7.94	2
Mélenchon	.39	4	.78	4	.06			
Le Pen	.27	5	.67	5	-.34			
Joly	.27	6	.46	6	-.17			
Poutou	.13	7	.32	7	-.28			
Dupont-Aignan	.11	8	.32	8	-.33			
Arthaud	.08	9	.26	9	-.39			
Cheminade	.03	10	.12	10	-.49			

The second hypothesis (H2) deals with scales with different labels but of the same length (in our experiment: $(0, 1, 2)$ and $(-1, 0, 1)$). It corresponds to a test of invariance under translation, i.e. adding a constant to each numerical label should not change the way voters vote, nor the overall collective result.

Hypothesis (H2– Invariance with respect to labels) *Numerical scales of the same length but with different labels are linearly equivalent.*

We refute H2: the statistical distribution of the lowest, median and highest grades depends on the scale. We also refute the related hypotheses that (i) the thresholds of approvals are equivalent, and that (ii) the labeling effects are uniform across candidates.

Cf. polarização ...

Negative votes to depolarize politics

Karthik H. Shankar[1,*]

[1] *Center for Memory and Brain, Boston University*

Normed Negative Voting : Consider a voting system where each voter assigns a positive or negative number to each candidate such that the magnitudes of all the numbers sum up to 10.

Example : In a three candidate election amongst $\{A, B, C\}$, voter-1 could vote as $\{+7, -1, -2\}$ while voter-2 could vote as $\{+3, +2, -5\}$. Both the voters express the same rank ordering of preferences, namely $A > B > C$, however their ballots clearly contain far richer information than just the relative ranks. Requiring the sum of magnitudes of the vote to be a constant (10) is mathematically termed as *Normed*; it serves to ensure the rule of equality *one-person-one-vote*.

Winning metric : To determine the winner, we shall construct a metric W that rewards popularity and penalizes polarity. It has to be a monotonically increasing function of popularity and a monotonically decreasing function of polarity. The candidate with the highest value of W is the winner. If two candidates have equal popularity, the one with lower polarity will have to win. Consider the following metric parametrized by two positive constants (c, b).

$$W_b^c(P, N) \equiv \frac{P - cN}{1 + b\,N/P} \tag{1}$$

Vote aggregation : For each candidate, aggregate the positive votes from all voters as P, and aggregate the negative votes from all voters as N. Then define for each candidate *Popularity* $\equiv$ P-N, and *Polarity* $\equiv$ N/P.

Electoral Studies
Volume 71, June 2021, 102335

Negative voting and party polarization: A classic tragedy

Till Weber ✉

Abstract

Elections around the globe attest to the persistence of polarization in democratic politics. Popular support for antagonistic elite strategies defies standard predictions of ideological convergence. This paper develops a new solution to the theoretical puzzle: The centrifugal drive in representative democracy is a byproduct of voters' disposition to evaluate policy platforms on the basis of issue positions that they dislike—to wit, negative voting. While reasonable individually, this behavior backfires collectively as elections dominated by negativity produce more polarized legislatures. Quite tragically, party polarization

When faced with two policy legs, a pure negative voter only considers the distance to the more distant leg. Thus, the utility function of a negative voter is

$$U_{ij} = \min\left(-\left|v_i - l_j\right|, -\left|v_i - r_j\right|\right) \tag{4}$$

Polarização

Transitividade

(*Value Restriction)*

French election. Although Chirac and Jospin led the two major parties, it seems fair to say that they did not inspire much passion. It was the extremist candidate, Le Pen, who aroused people's repugnance or enthusiasm: evidence suggests that a huge majority of voters ranked him third or first among the three top candidates; few ranked him second. One can argue about whether such polarization is good or bad for France. But it is unquestionably good for majority rule. If voters agree that one candidate of three is not ranked second, transitivity is guaranteed. This property, called value restriction, was introduced in 1966 by Amartya Sen of Harvard University.

(Dasgupta; Maskin, 2004)

Voto 101 simples

Cardinal

$$s_i(x) \in \{-1, 0, +1\}$$

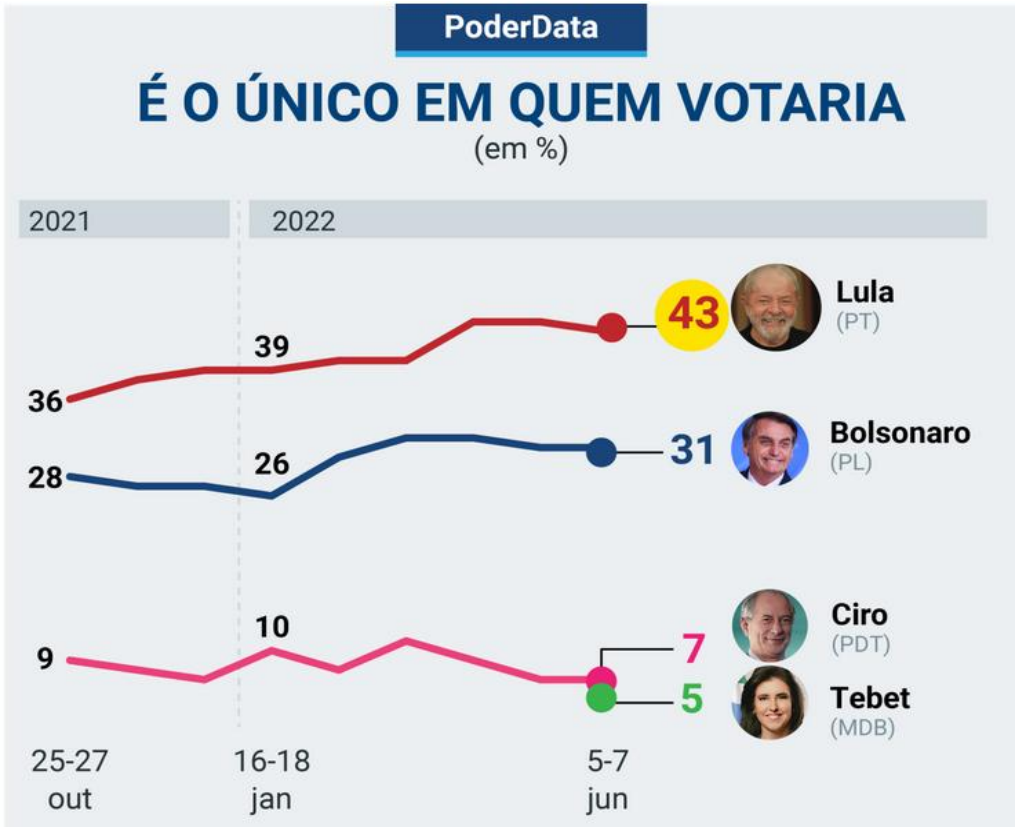
$$S(x) = \sum_i s_i(x)$$

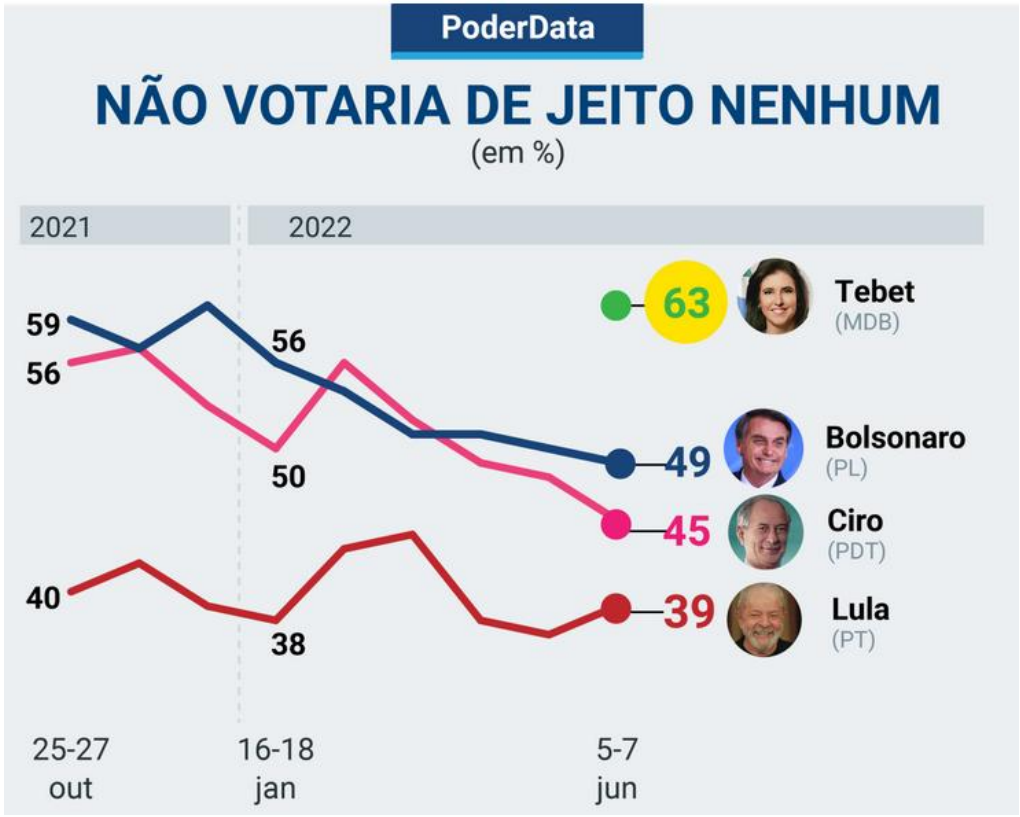
$x \succ y$ se e somente se $S(x) > S(y)$

Nuances:

- 1 único voto por eleitor ? (possibilidades: 1,2, 3,...)
- Indiferença ativa: Zero como opção ?
- (...)

Coleta e tratamento de dados





Databases ...

14 April 2025

About the Comparative National Elections Project

The **Comparative National Elections Project (CNEP)** is a partnership among scholars who have conducted election surveys on five continents. Founded in the late 1980s, CNEP now includes 74 surveys from 1990 to 2025 in 30 different countries and Hong Kong.

The

Simulações e análises

$$p_+ = \frac{\sum_i \text{plus}_i}{N_{\text{ref}}}$$

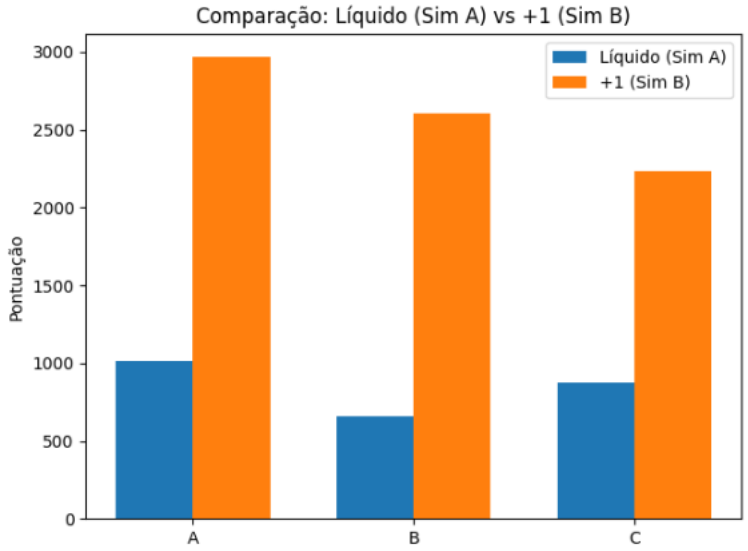
$$p_- = \frac{\sum_i \text{minus}_i}{N_{\text{ref}}}$$

$$q_i^+ = \frac{\text{plus}_i}{\sum_j \text{plus}_j}$$

$$q_i^- = \frac{\text{minus}_i}{\sum_j \text{minus}_j}$$

```
Users/CBP/Desktop/Simulacoes/simula_afetivo.py
=== PARÂMETROS-ALVO (derivados do seu dataset) ===
p_plus ~ 0.9  | p_minus ~ 0.6
q_plus  (por candidato): {'A': np.float64(0.389), 'B': np.float64(0.333), 'C': np.float64(0.278)}
q_minus (por candidato): {'A': np.float64(0.333), 'B': np.float64(0.367), 'C': np.float64(0.3)}

=== RESULTADOS (simulação N_new= 10000 ) ===
Contagens +1 simuladas: {'A': 3480, 'B': 3025, 'C': 2456}  | total: 8961
Contagens -1 simuladas: {'A': 1885, 'B': 2135, 'C': 2048}  | total: 6068
Eleitores com +1 e -1 (mesmo eleitor): 5453
Eleitores que não marcaram ninguém: 424
Total de eleitores: 10000
```



Parâmetro de acompanhamento e Estratégia

Experimento: Voto 101 x Polarização?

- Situação de recompensa
- Contexto: polarização + 101
- Simulação (gamificação)
- Comparação

Voto 101 x Voto Negativo

Cardinal -Ordinal

$$s_i(x,y) = \begin{cases} +1, & \text{se } r_i(y) - r_i(x) \geq k, \\ 0, & \text{se } |r_i(y) - r_i(x)| < k, \\ -1, & \text{se } r_i(y) - r_i(x) \leq -k. \end{cases}$$

$$S(x,y) = \sum_i s_i(x,y)$$

$$x \succ y \text{ se e somente se } S(x,y) > 0$$

Nuances:

- Variar |k|
- Variar k1, k2, k3
- (...)

Simulação (ChatGPT)

Rule (k = 2)

For each voter and pair (x, y) with ranks $r_i(\cdot)$ (1 = best):

- $s_i(x, y) = +1$ if $r_i(y) - r_i(x) \geq 2$ (x at least 2 positions above y)
- $s_i(x, y) = -1$ if $r_i(y) - r_i(x) \leq -2$
- $s_i(x, y) = 0$ otherwise

  Aggregate $S(x, y) = \sum_i s_i(x, y)$. If $S > 0 \Rightarrow x \succ y$; $S < 0 \Rightarrow y \succ x$; $S = 0 \Rightarrow$ tie.

Profile (same cyclic rankings)

- V1: **A** > B > C > D > E
- V2: **B** > C > D > E > A
- V3: **C** > D > E > A > B
- V4: **D** > E > A > B > C
- V5: **E** > A > B > C > D

Pairwise results (S-matrix)

Values are $S(x, y)$ (row vs column). Positive ⇒ row beats column.

mathematica

	A	B	C	D	E
A	–	-1	1	-1	1
B	1	–	-1	1	-1
C	-1	1	–	-1	1
D	1	-1	1	–	-1
E	-1	1	-1	1	–

- **Winners per pair:**

  B>A, A>C, D>A, A>E

  C>B, B>D, E>B

  D>C, C>E

  E>D
- Each candidate wins **2** and loses **2** → a perfectly balanced **5-cycle** (no Condorcet winner).

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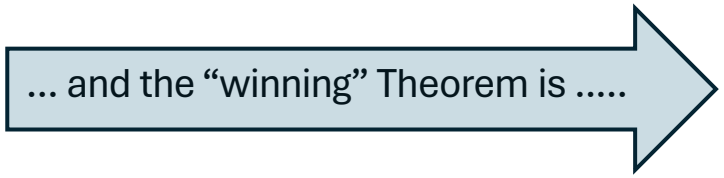
Teoremas de Caracterização

Abordagem axiomática

Axioms / Principles

- Pareto (Unanimity)
- Anonymity
- Neutrality
- Irrelevant Alternatives (IIA)
- Generic decisiveness
- Transitivity
- Positive Responsiveness
- Consistency
- (...)



“Characterization Theorems”

Theorems

- Arrow (1951)
- Black (1952)
- Saari (1996)
- Dasgupta; Maskin (2008)
- Maskin (2025)
- (...)

Violação da IIA

45%	55%
x	*y*
z	*x*
y	*z*

Under rank-order voting,
x gets 3×45 + 2×55 = 245 points
y gets 3×55 + 1×45 = 210 points
z gets 2×45 + 1×55 = 145 points

So, the social ranking is *x*, *y*, *z*

Now, consider

45%	55%
x	*y*
y	*x*
z	*z*

Under rank-order voting, the social ranking is now *y*, *x*, *z*, a violation of IIA as applied to *x* and *y*.

The standard rationale for IIA (see Arrow 2012, p.26) is that in making a choice between candidates *x* and *y*, society need take account only of how individuals rank *x* and *y*; how they feel about candidate *z* is irrelevant. But a Borda-count proponent might retort: The position of candidate *z* in Example 1 may provide useful information about the intensity of group 1 voters' preferences between *x* and *y*. In the first case, *z* lies between *x* and *y*—suggesting that the gap between *x* and *y* may be fairly large.

The main result of this paper establishes that a continuous SWF satisfies U, MIIA, A, N, PR, and RC (the other Arrow conditions—P and ND—are redundant) if and only if it is the Borda count.

Thus, our main result implies that for standard voting rules, MIIA is the axiom that uniquely distinguishes the Borda count.

(Maskin, 2025, p. 393)

Theorem 4.4.3.

There exist procedures satisfying universal domain, unanimity, intensity IIA, and voter responsiveness. One such procedure is the Borda Count (BC). Indeed, the BC is the only positional method to satisfy these conditions.

(Saari, 1994, p. 336)

MIIA: what abou mixed voting?

$$s_i(x,y) = \begin{cases} +1, & \text{se } r_i(y) - r_i(x) \geq k, \\ 0, & \text{se } |r_i(y) - r_i(x)| < k, \\ -1, & \text{se } r_i(y) - r_i(x) \leq -k. \end{cases}$$

$$S(x,y) = \sum_i s_i(x,y)$$

Property	Satisfied?	Notes
Continuity	✅ (discrete domain)	Trivial in ordinal space; fails if utilities continuous.
Unrestricted domain	✅	Defined for all ranking profiles.
Anonymity	✅	All voters treated equally.
Neutrality	✅	Alternatives treated symmetrically.
Positive responsiveness	✅	Raising a score for x never hurts x.
Ranking consistency	✅	Depends only on rank gap between x and y.

Vested interest, those who are in power, do not like the idea that people may vote against them. It was therefore no surprise to us that when we first proposed the idea in Taiwan that there was not a single legislator voicing support while plenty voiced opposition. However, we are greatly encouraged that the general public likes the idea. Our national survey in Taiwan showed even though few have heard our detailed explanation of its merits, 43% agree that election laws should be changed to allow voters this option with 34% against. This is consistent with our belief people will see it as a basic right.

Sam Chang, President
Negative Vote Association
sam.chang@negativevote.org

https://www.negativevote.org/news/pid_1.html?lang=en
https://www.facebook.com/groups/NegativeVote/

Date of submission: Oct. 4, 2016

Conclusões...

Franchise

by Isaac Asimov

"The first computers were much smaller than Multivac. But the machines grew bigger and they could tell how the election would go from fewer and fewer votes. Then, at last, they built Multivac and it can tell from just one voter."

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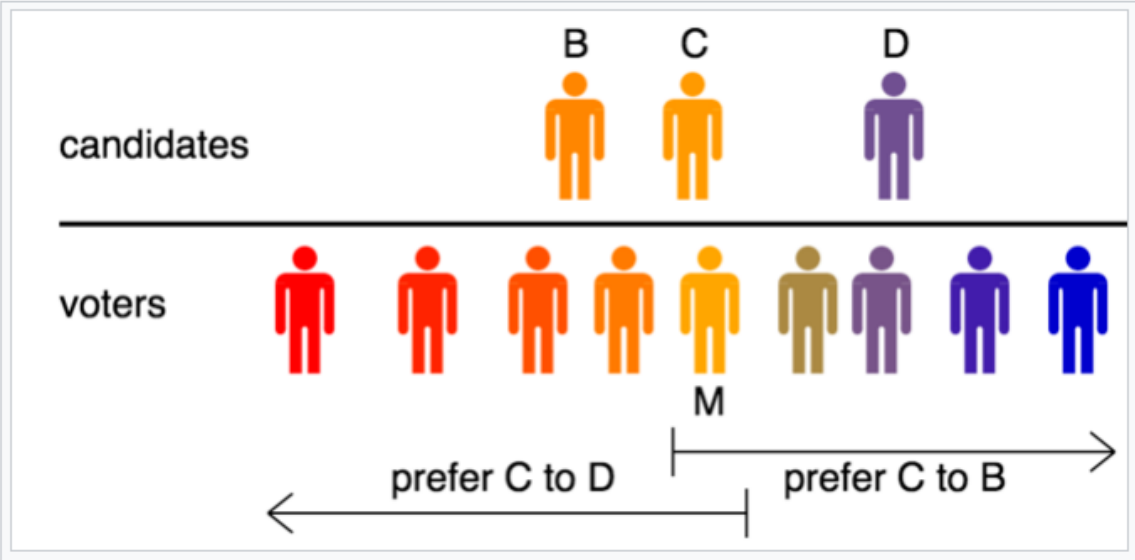
Clovis Belbute Peres

Tópicos Especiais em Economia do Setor Público

Brasília, DF, nov./2025

...Bônus ...

1 Dimensão de escolha



Then, the median voter theorem says that the candidate closest to the median voter is a *majority-preferred* (or *Condorcet*) candidate.

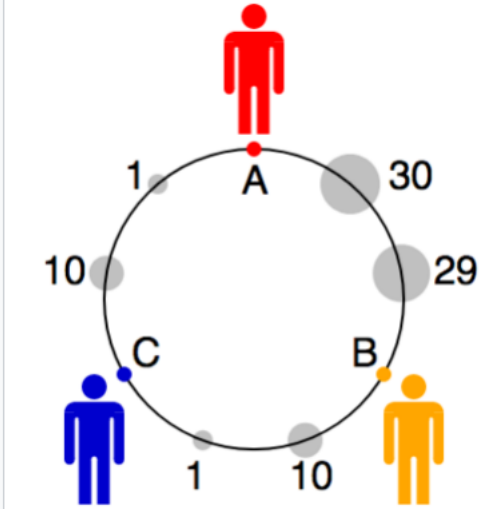
n Dimensões de escolha

Ranking	Votes
A-B-C	30
B-A-C	29
C-A-B	10
B-C-A	10
A-C-B	1
C-B-A	1

	Number of voters
A > B	41:40
A > C	60:21
B > C	69:12
Total	81

Condorcet – A

Borda – B



Saari's example of a domain where the Condorcet winner is not the socially-optimal candidate.

Borda count (but not the Condorcet winner) correctly identifies the candidate closest to the center (as determined by the geometric median).[15]