

# Social choice and the self-determination debate: Evaluating alternative methods for preference aggregation in Catalonia

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BARCELONA



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d'Estudis  
d'Opinió

# Motivation

- In recent debates on secession (in Catalonia and Scotland, for example) the question of a third alternative between secession and the status quo (devo-max, federalism or the like) is often raised.
- This was debated also with regards to a possible 2nd *Brexit* referendum.

# Motivation

[News](#) > [Scottish News](#)

## Scottish Independence: Labour-backed referendum would contain "third" federal option

A future Scottish independence referendum backed by Labour would contain a third option on federalism, it has emerged.

By [Scott Macnab](#)

Thursday, 8th August 2019, 2:25 pm



# Motivation

Scottish people would have voted for 'devo max'. That's why it's not an option

*Lesley Riddoch*

The referendum's yes or no vote will deny Scotland true democracy. Labour and the Lib Dems must address this deficit



# Motivation

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### Scottish independence: Devo max 'most popular option' among Scots

© 18 February 2014

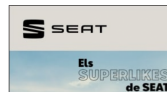
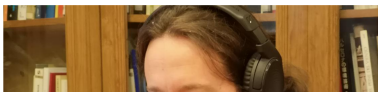


# Motivation

'EL MÓN A RAC1'

## Iglesias proposa un referèndum amb tres opcions: 'sí'/'no' a la independència i una tercera via

- El líder d'Unides Podem admet que la seva proposta és "pràcticament inviable" perquè caldrà negociar amb tots els partits fer renúncies



# Motivation

CONSULTA SOBRE EL FUTUR POLÍTIC DE CATALUNYA 2014  
CONSULTA SOBRE EL FUTURO POLÍTICO DE CATALUÑA 2014

Vol que Catalunya esdevingui un Estat?  
*¿Quiere que Cataluña sea un Estado?*

SÍ  NO

En cas afirmatiu  
*En caso afirmativo*

Vol que aquest Estat sigui independent?  
*¿Quiere que este Estado sea independiente?*

SÍ  NO

# Motivation



The Economist

Today Weekly edition | Menu

Open Future  
**Open Future**



**The debate over a second Brexit referendum**

## The dangerous imperfections of a three-way vote

A great national decision shouldn't depend on voters applying game theory, says Peter Kellner





# Motivation

## Brexit deadlock: this three-way referendum design could break it

7 dicembre 2018 14:33 CET

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The 2016 EU referendum resulted in a marginal victory for Brexit and a divided nation. After two years of negotiations, politicians and voters seem further divided. The final decision may now be put back in the hands of voters in another referendum. So how could such a referendum produce an outcome to settle the debate? Or at least, could we design a referendum that will not be perceived as an effort to overturn the 2016 decision? The answer is not easy, and different designs lead to different outcomes. As we however argue, while certain designs favour consensus, others may lead to further divisions.

# Motivation

- Proponents of three-way referenda tend to argue that:
  - ▶ A three-way choice can better represent citizens' preferences.
  - ▶ It will minimize aggregate dissatisfaction.
  - ▶ Favor centrist or moderate options.
- Opponents of three-way referenda often point to several problems:
  - ▶ Results may depend on the aggregation method.
  - ▶ Intransitivities and Condorcet cycles may occur.
  - ▶ Results could be sensitive to strategic voting.

# The study

- In this study we analyze the question empirically using data from Catalonia.
- We use preference ranking questions to explore the structure of citizens' preferences with respect to the procedure and outcome of the secession and self-determination debate.
- We then analyze the results under alternative aggregation methods.

# Data and methods

- We use the CEO 2020 socio-political survey (telephone interviews,  $n=1500$ , fielded in September and October 2020). Data weighted by past vote recall.
- We use two questions in which respondents were asked to rank two (randomly ordered) sets of three alternative choices:
  - ▶ Procedural alternatives: Unilateral secession, Negotiated Referendum and Status Quo. [▶ Wording](#)
  - ▶ Outcome alternatives: Independence, Federalism, Status Quo. [▶ Wording](#)
- Results are analyzed and presented using the `voteviz` package as described in Eggers 2020.

# Aggregation methods

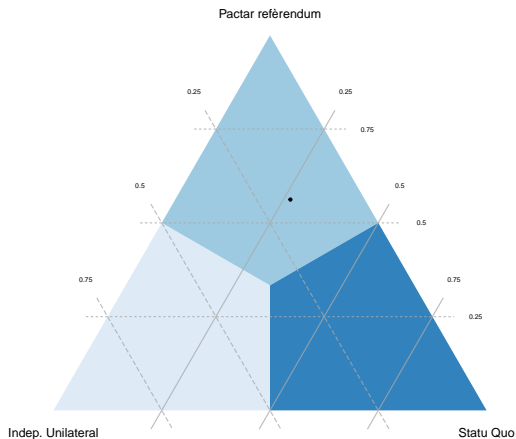
We analyze the case using four different methods:

- 1 Plurality vote: The option with more 1st preferences wins.
- 2 Borda count: Gives each alternative 1 point for each ballot on which it is ranked first and  $1/2$  points when it is ranked second; the winner is the candidate with the most points.
- 3 Condorcet: The option that beats in a pairwise contest every other option wins.
- 4 Ranked choice (Instant-runoff): The option with the lowest share of first preference is eliminated, and among the remaining options the one that is ranked higher on a larger share of ballots wins.

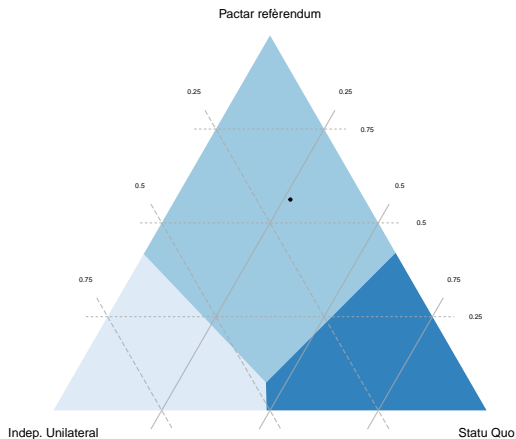
# Procedural preferences

1st preference	2nd preference	3rd preference	Percentage
Unilateral Ind.	Referendum	Statu Quo	15.29
Unilateral Ind.	Statu Quo	Referendum	1.88
Referendum	Statu Quo	Unilateral Ind.	31.03
Referendum	Unilateral Ind.	Statu Quo	25.18
Statu Quo	Referendum	Unilateral Ind.	25.31
Statu Quo	Unilateral Ind.	Referendum	1.30

# Procedural preferences: Plurality vote

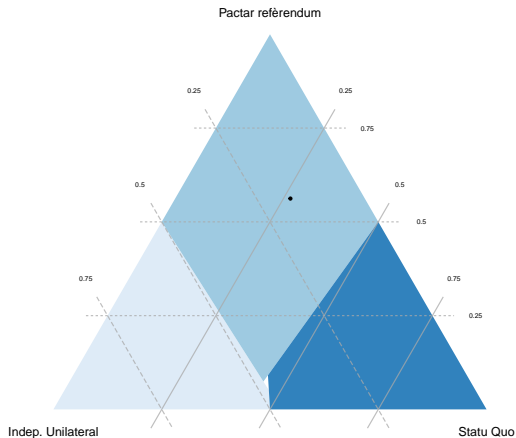


# Procedural preferences: Borda count

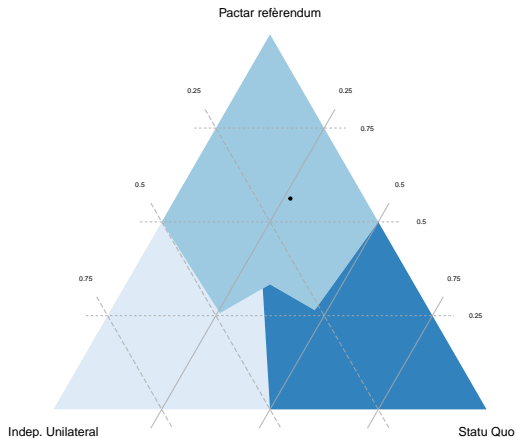




# Procedural preferences: Condorcet



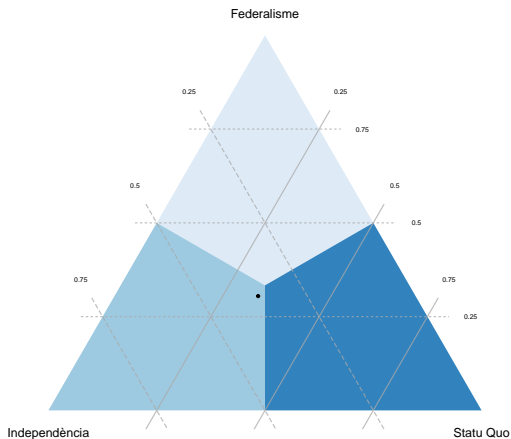
# Procedural preferences: Ranked-choice vote



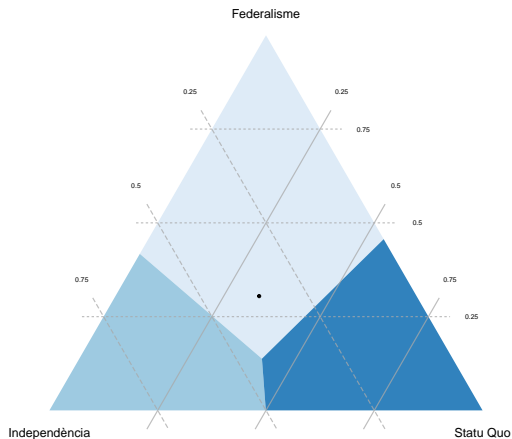
# Outcome Preferences

1st preference	2nd preference	3rd preference	Percentage
Independence	Federalism	Statu Quo	30.49
Independence	Statu Quo	Federalism	5.86
Federalism	Statu Quo	Independence	18.92
Federalism	Independence	Statu Quo	11.55
Statu Quo	Federalism	Independence	27.92
Statu Quo	Independence	Federalism	5.26

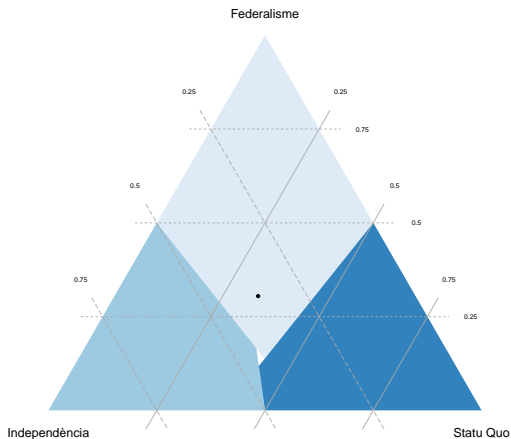
# Outcome preferences: Plurality vote



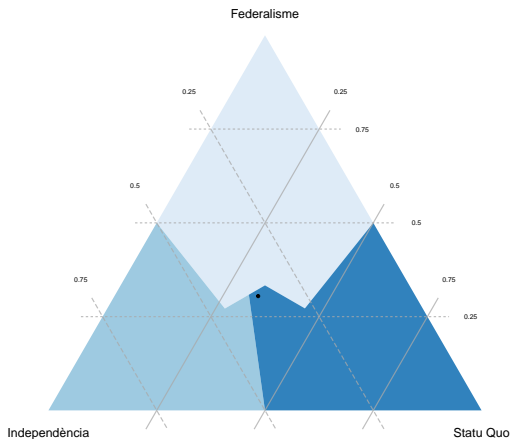
# Outcome preferences: Borda count



# Outcome preferences: Condorcet



# Outcome preferences: Ranked-choice vote



# Incomplete rankings

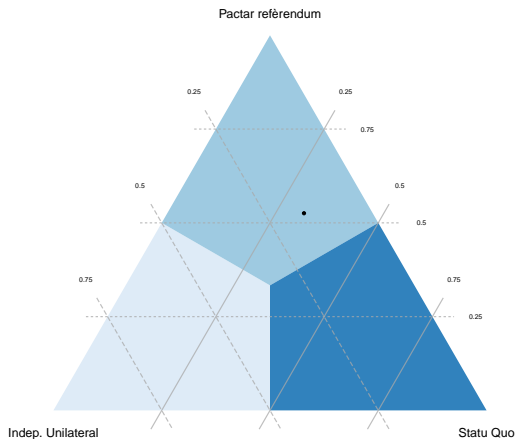
- In some systems incomplete rankings may be admissible.
- In our study, we denote as incomplete those rankings for which no 2nd preference was declared.
- We incorporate them into the analysis, although one could think that in a campaign for a three-option vote, voters would develop their second preference.



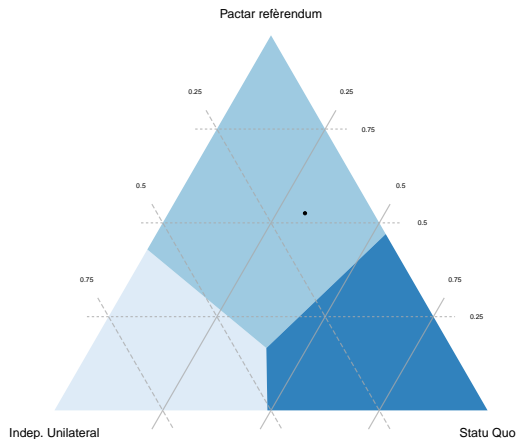
## Procedural preferences with incomplete rankings

1st preference	2nd preference	3rd preference	Percentage
Unilateral Ind.	Referendum	Statu Quo	12.38
Unilateral Ind.	Statu Quo	Referendum	1.53
Unilateral Ind.	NULL	NULL	1.78
Referendum	Statu Quo	Unilateral Ind.	25.13
Referendum	Unilateral Ind.	Statu Quo	20.39
Referendum	NULL	NULL	7.04
Statu Quo	Referendum	Unilateral Ind.	20.5
Statu Quo	Unilateral Ind.	Referendum	1.05
Statu Quo	NULL	NULL	10.02

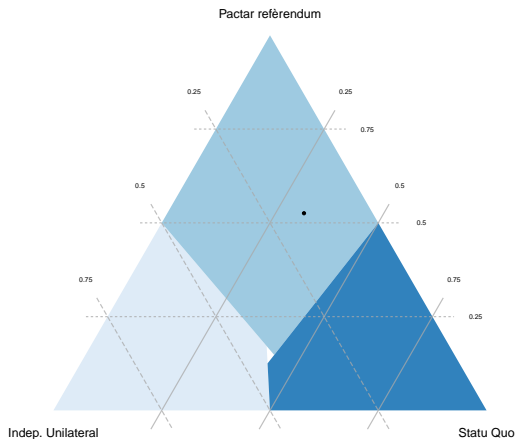
# Procedural preferences with incomplete: Plurality vote



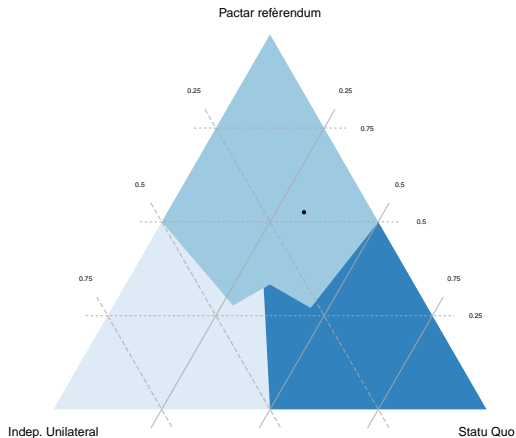
# Procedural preferences with incomplete: Borda count



# Procedural preferences with incomplete: Condorcet



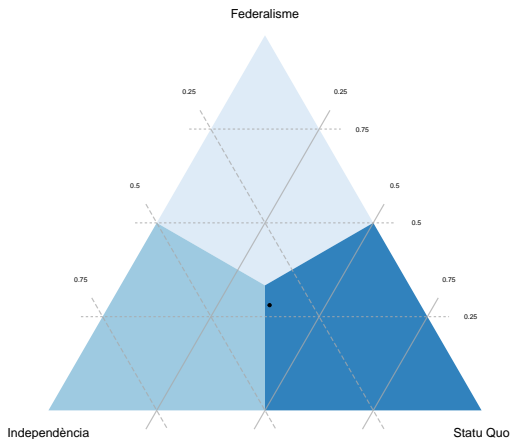
# Procedural preferences with incomp.: Ranked-choice vote



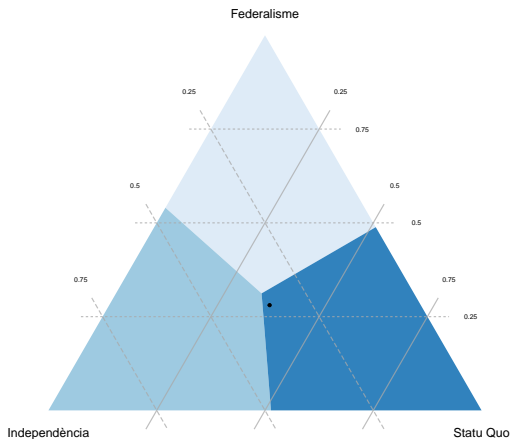
# Outcome Preferences with incomplete rankings

1st preference	2nd preference	3rd preference	Percentage
Independence	Federalism	Statu Quo	25.02
Independence	Statu Quo	Federalism	4.81
Independence	NULL	NULL	5.09
Federalism	Statu Quo	Independence	15.53
Federalism	Independence	Statu Quo	9.47
Federalism	NULL	NULL	3.06
Statu Quo	Federalism	Independence	22.91
Statu Quo	Independence	Federalism	4.31
Statu Quo	NULL	NULL	9.82

# Outcome preferences with incomplete: Plurality vote

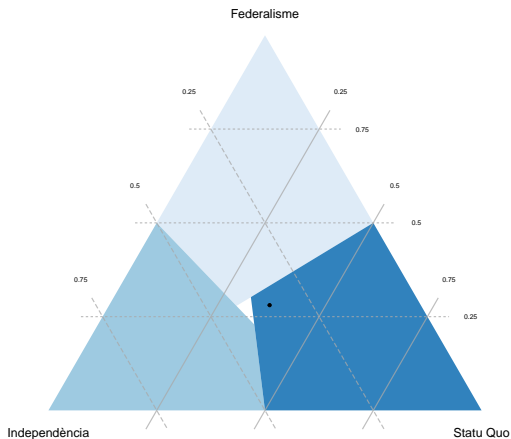


# Outcome preferences with incomplete: Borda count

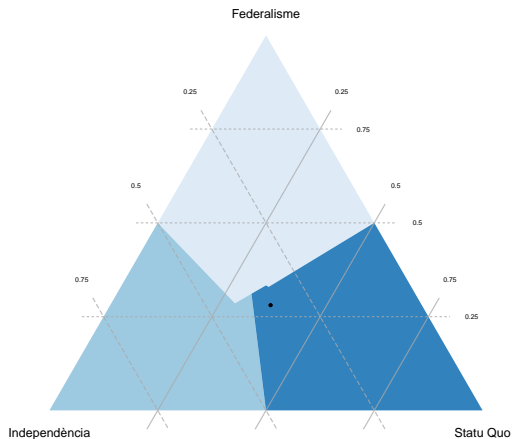




# Outcome preferences with incomplete: Condorcet



# Outcome preferences with incomp: Ranked-choice vote



# Conclusion

- In a three-way contest of procedural alternatives, an agreed referendum would prevail no matter the method used for aggregation.
- In the case of outcome preferences the result is much more sensitive to the aggregation method and the incorporation of incomplete rankings, as preferences are much closer.
- No evidence of Condorcet cycles.

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## Question wording procedural preferences

P30 Hi ha diverses opcions pel que fa a la relació entre Catalunya i Espanya. A continuació li en llegiré algunes. Quina de les següents opcions considera vostè que és la millor per Catalunya? **NOMÉS UNA RESPOSTA ALEATORI**

- 1 Ser una comunitat autònoma d'Espanya.
- 2 Pactar un referèndum amb l'estat espanyol.
- 3 Declarar la independència unilateralment.
- 98 No ho sap
- 99 No contesta

P31 I la segona millor? **NOMÉS UNA RESPOSTA ALEATORI**

- 1 Ser una comunitat autònoma d'Espanya.
- 2 Pactar un referèndum amb l'estat espanyol.
- 3 Declarar la independència unilateralment.
- 98 No ho sap
- 99 No contesta

## Question wording outcome preferences

P28 Hi ha diverses opcions pel que fa a la relació entre Catalunya i Espanya. A continuació li en llegiré algunes. Quina de les següents opcions considera vostè que és la millor per Catalunya? NOMÉS UNA RESPOSTA, ALEATORI

1 Ser una comunitat autònoma d'Espanya.

2 Ser un Estat dins una Espanya federal.

3 Ser un estat independent.

98 No ho sap

99 No contesta

P29 I la segona millor? NOMÉS UNA RESPOSTA, ALEATORI

1 Ser una comunitat autònoma d'Espanya.

2 Ser un Estat dins una Espanya federal.

3 Ser un estat independent.

98 No ho sap

99 No contesta