Ranked choice voting

A systems approach to better representation?

Moon Duchin, AWM 50th Anniversary WeSpeak Series
so we want to run a representative democracy.
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How should we elect?
the American way: plurality elections in 435 single-member districts
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what's good about districts?
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• Can secure minority representation within a majority-rules paradigm
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• Can secure *minority representation* within a majority-rules paradigm

• Should pick out a "cognizable" chunk of territory that corresponds to *communities* of interest
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- Should pick out a "cognizable" chunk of territory that corresponds to **communities** of interest

- Representative can carry the **local interests** to the larger body
Voting Rights Act ❤ single-member districts
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• U.S. has an ugly history of schemes and devices to block and dilute the Black vote in particular, minority representation more generally
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• Voting Rights Act of 1965 comes on the scene when many Southern states are scrambling to come up with exclusionary systems
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is gerrymandering to blame?

try blind districting to see
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Distriicts with BVAP > 50%

20.64% BVAP

Congress
Senate
House

NC NC NC
Congress
Senate
House

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share of majority-Black districts now
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House

20.64% BVAP

share of majority-
Black districts now

share found in 2 million
blind attempts

Districts with BVAP > 50%
In an ideal democracy, the people would rule, but the minorities would be protected against the power of majorities. But if a group is unfairly treated, for example, when it forms a racial minority, and if the problems of unfairness are not cured by conventional assumptions about majority rule, then what is to be done? The answer is that we may need an alternative to winner-take-all majoritarianism....

I pursue voting systems that might disaggregate The Majority so that it does not exercise power unfairly or tyrannically. I aspire to a more cooperative political style of decision-making... a positive-sum, taking-turns solution.
“It’s districting in general—not race-conscious districting in particular—that is the problem.”
the **system** matters.

let's see this with cartoons.
40% dog lovers
60% cat lovers
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plurality at-large: who got most votes?
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plurality at-large: who got most votes?
meet your new cat overlords
that's terrible, let's try districts!
that's terrible, let's try districts!
that's terrible, let's try districts!
that's terrible, let's try districts!
that's terrible, let's try districts!
gerrymandering nirvana
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60% cat lovers
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votes transfer from those elected or eliminated
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votes transfer from those elected or eliminated

presto! proportionality
how about in the real world?
Santa Clara CA
mggg.org/santaclara

- neutral ensembles don't find effective districting plans for 40% Asian minority, while RCV quite effective
Chicago IL
mggg.org/chicago

- we considered a move from 50 single-member districts to 10x5 RCV
Chicago IL

mggg.org/chicago

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we found it surprisingly easy to build ten districts out of large "community areas" that have various properties we sought

Chicago IL
mggg.org/chicago
Lowell MA
mogg.org/lowell
Lowell MA
mggg.org/lowell

- city sued by Latinx/Cambodian coalition under VRA—our report found districts ineffective, RCV effective
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- voters got to vote on a voting system!
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Yakima County WA
mggg.org/yakima

• districts may get 1/3 effective for Latinx/Native voters, depending on turnout and crossover. 0/3 easily possible.
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mggg.org/yakima

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- RCV solid 1/3, likely 2/5
how do we model this?
Statistical ranking models
or, data science without much data

- **Plackett-Luce**: one-by-one probabilistic draws
- **Bradley-Terry**: pairwise preferences
- **Alternating crossover**: ballots are AAABBB or BABABA
- **Cambridge sampler**: use actual Cambridge historical ballots (A* / B* type)
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*major problem*: existing data sources not rich enough to fit a model
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**major problem**: existing data sources not rich enough to fit a model

**our solution**: turn the knobs, i.e., try many ways and report the range of outcomes
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localities
new results
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• 32nd District Court, Terrebonne Parish LA (~18% BCVAP)
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- City council, Cincinnati OH (~40% BCVAP)
new results

- 32nd District Court, **Terrebonne Parish LA** (~18% BCVAP)

- City council, **Cincinnati OH** (~40% BCVAP)

- County commission, **Jones County NC** (~32% BVAP)
new results

- 32nd District Court, Terrebonne Parish LA (~18% BCVAP)

- City council, Cincinnati OH (~40% BCVAP)

- County commission, Jones County NC (~32% BVAP)

- City council, Pasadena TX (~48% HCVAP)
new results

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• City council, Cincinnati OH (~40% BCVAP)

• County commission, Jones County NC (~32% BVAP)

• City council, Pasadena TX (~48% HCVAP)
Punchlines!
so how should we elect?
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• Gives voters latitude to form new coalitions in a bottom-up fashion
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• Doesn't depend on clustering (AKA residential segregation) to function
Punchlines!
so how should we elect?

- Ranked choice gives us a way to use multi-member districts and get better proportionality "for free"
- Gives voters latitude to form new coalitions in a bottom-up fashion
- Doesn't depend on clustering (AKA residential segregation) to function
- Less gerrymandering through less line-drawing!
### Ranked choice voting and representation

<table>
<thead>
<tr>
<th>Number of seats open</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of ballots cast*</td>
<td>1000</td>
</tr>
<tr>
<td>Minority percentage</td>
<td>30</td>
</tr>
</tbody>
</table>

*Although 1000 ballots is low for most real-world elections, we recommend this value for computational efficiency and since it is high enough to simulate most effects of interest.

#### Type of model
- Luce model
- Bradley-Terry model
- Alternating crossover
- Cambridge sampler

#### Basic inputs

<table>
<thead>
<tr>
<th>Minority-preferred candidate prefix</th>
<th>MIN</th>
<th>No. of minority-preferred candidates</th>
<th>3</th>
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</thead>
<tbody>
<tr>
<td>Minority support</td>
<td>0.7</td>
<td>Majority support</td>
<td>0.2</td>
</tr>
<tr>
<td>Majority-preferred candidate prefix</td>
<td>MAJ</td>
<td>No. of majority-preferred candidates</td>
<td>3</td>
</tr>
<tr>
<td>Minority support</td>
<td>0.3</td>
<td>Majority support</td>
<td>0.8</td>
</tr>
</tbody>
</table>

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**try it yourself**

[thomasweighill.shinyapps.io/rcv-app/](thomasweighill.shinyapps.io/rcv-app/)
Collaborators on RCV projects:

Amy **Becker** (MGGG), Gerdus **Benade** (BU), Ruth **Buck** (Penn State), Bernard **Fraga** (Emory), Dara **Gold** (MGGG), Thomas **Weighill** (MGGG)
thanks!

mggg.org/RCV

(mduchin@mggg.org)