The Anatomy of Voting on the Long Ballot: Evidence from South Carolina Ballot Image Logs

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Motivation: Are *national* and *local* electoral politics contested on the same partisan dimension?
Contribution: Observed behavior on actual (not self-reported) individual vote choice.

Data: Ballot Image Logs

Past work relies on either opinion surveys or ecological inference (cf. Gerber and Lewis, 2004). Ballot image logs overcome measurement challenges inherent in surveys and aggregate data:

	Ballot Image Logs	Voter Files	Precinct Returns	Surveys
Individual-level?	✓	✓		✓
Actual Vote choice observed?	✓		✓	Self-report
Down-ballot races observed?	✓		✓	
No selection / sampling error?	✓	✓	✓	
Linkable to commercial data?		✓		✓

The South Carolina Election Commission makes public all voters' ballot images.

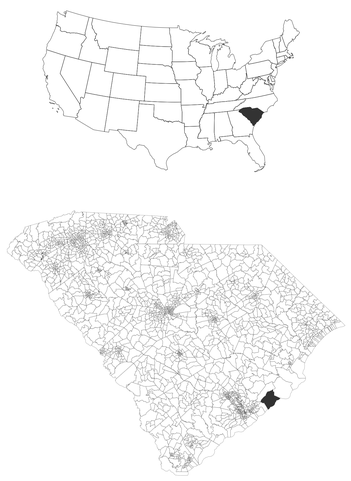
Coverage: All votes cast in South Carolina state elections, 2010-2017

58 elections, including primaries, runoffs, and specials. The four generals featured many offices on the same ballot.

Election	Ballots Observed	Offices per Ballot
2010 Generals	1,132,656	21
2012 Generals	1,822,037	12
2014 Generals	1,193,467	20
2016 Generals	1,984,439	12

Example log of three voters (Charleston County - Awendaw)

Each ballot image shows all the voter's actual votes (with precinct):



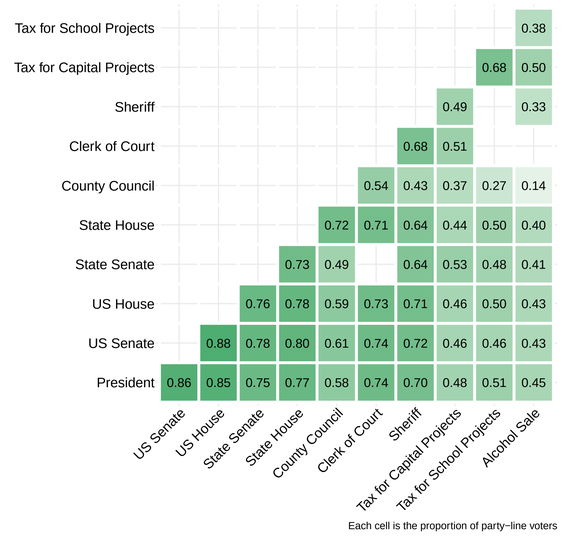
```
VOTER A
-------------------------------------------------------------------------------
 10 Hillary Rodham Clinton       President and Vice President
 18 Thomas Dixon                 U.S. Senate
 27 Dimitri Cherny               CON0001 U.S. House of Representatives
 53 Peter J Tecklenburg          Auditor
 61 Andrew C Smith.              County Treasurer
104 No                           Question 1
107 No                           Question 2

VOTER B
-------------------------------------------------------------------------------
 14 Donald J Trump               President and Vice President
 22 Tim Scott                    U.S. Senate
 30 Mark Sanford                 CON0001 U.S. House of Representatives
 35 Stephen Goldfinch            SEN0034 State Senate
 38 Lee Hewitt                   HOU0108 State House of Representatives
 41 Scarlett Wilson              Solicitor Circuit 9
 44 Al Cannon                    Sheriff
 47 Julie J Armstrong            Clerk of Court
 50 Rae H Wooten                 Coroner
 54 Elizabeth Moffly             Auditor
 59 Mary E Tinkler.              County Treasurer
 64 John H Smoak                 Soil and Water District Commission
 68 Tony E Lewis                 CSB City of Charleston
 71 Chris Collins                CSB North Area
 74 Louis L Smith                CSB North Area
 78 Priscilla Jeffery            CSB West Ashley
 80 Michael Miller               CSB West Ashley
 84 Anita Renee Alston-Gore      SCH0001 Con SB St James Santee District
 88 Juanita M Middleton          SCH0001 Con SB St James Santee District
 89 Samuel N Robinson            SCH0001 Con SB St James Santee District
104 No                           Question 1
107 No                           Question 2

VOTER C
-------------------------------------------------------------------------------
  1 Democratic                   STRAIGHT PARTY
 10 Hillary Rodham Clinton       President and Vice President
 18 Thomas Dixon                 U.S. Senate
 27 Dimitri Cherny               CON0001 U.S. House of Representatives
 44 Al Cannon                    Sheriff
 47 Julie J Armstrong            Clerk of Court
 53 Peter J Tecklenburg          Auditor
 58 Mary Tinkler                 County Treasurer
 84 Anita Renee Alston-Gore      SCH0001 Con SB St James Santee District
 86 Thomas L Colleton Jr         SCH0001 Con SB St James Santee District
 87 Erma J Harrell               SCH0001 Con SB St James Santee District
103 Yes                          Question 1
106 Yes                          Question 2
```

Voters Split their Ticket between Federal and State Offices

Party-line Vote$_i$ (a, b): Voter i votes for Republicans, or Democrats, in both race a and race b

Between federal and state-wide offices, 85-95 percent of voters vote the party line. But among state legislator, county council, judicial, sheriff, and clerk races (all with party-labels), only 50-75 percent of voters vote the party line. The number is lower still with referenda.

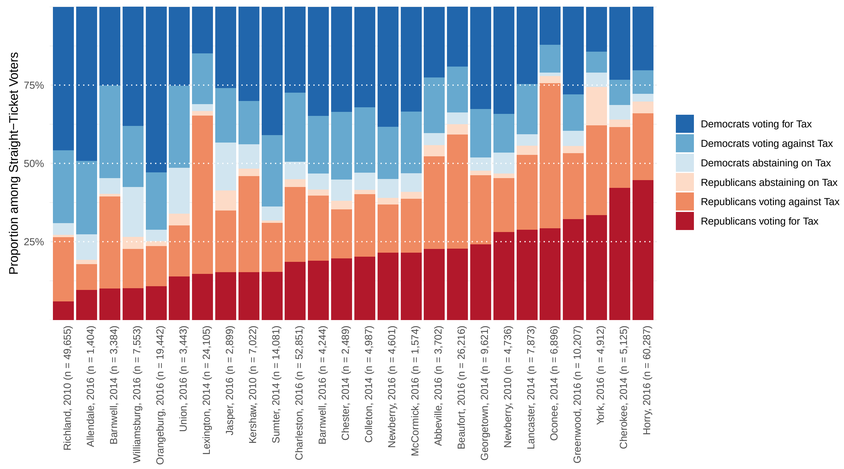
Prevalence of Party-line Voting in the 2016 Generals, by Pairs of Offices (Contested Races only)



Preferences over Local Tax Hikes are not Partisan

When counties hold a referendum for a sales tax hike to fund local infrastructure, many Republicans vote *for* more Taxes; and a sizable amount of Democrats vote *against*.

Breakdown of Vote Choice in 27 County Referenda



* Voter's parties are their choice on the straight ticket. Thus voters who did not select a ticket (about 50 percent) are excluded.

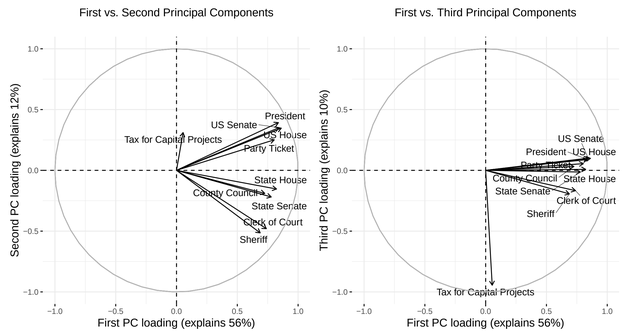
Dimensionality Reduction: PCA, Hierarchical Clustering, IRT

Encode, for each voter's vote

- `-1`: Democrat candidate / Democratic party ticket / Yes on pro-tax referendum
- `0`: Abstain / Write-In / No major party ticket selected
- `+1`: Republican candidate / Republican party ticket / No on pro-tax referendum

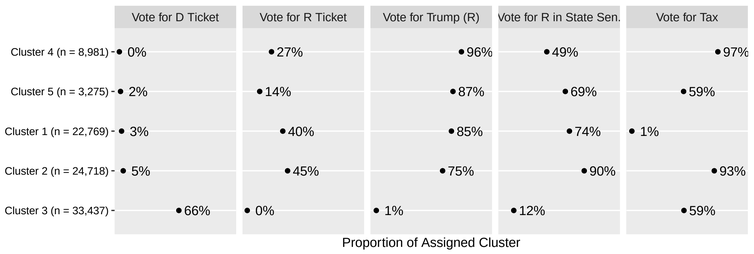
Votes summarized by three principal components

Three linear combinations of votes explain around 80 % of the variance. They appear to separate (i) Democrat-Republican (≈ 56 %), (ii) federal - subnational (≈ 12 %), and (iii) a dimension specific to referendum (≈ 10 %):



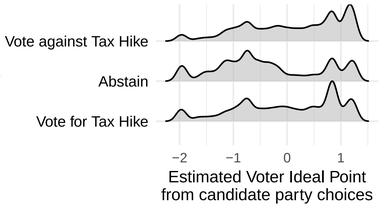
Party as coalitions: Cluster analysis identifies subgroups within party

A hierarchical clustering algorithm constructs a tree-based group classification. Five clusters, for example, distinguish Trump Republicans and non-Trump Republicans:



One-dimensional ideal points do not capture preferences over tax hikes

Votes on partisan races can also be summarized by ideal points in a IRT model. Do ideal points predict races in other choices?



* PCA computed with singular value decomposition via `prcomp`, Clusters by fast agglomerative hierarchical clustering via `hclust`, ideal points from partisan candidate races by an ordinal IRT model via `emIRT`. All figures use 2016 counties which held a Sales Tax Hike Referendum.