

SPATIAL VOTING MODELS
EITM SUMMER INSTITUTE
WASHINGTON UNIVERSITY IN ST LOUIS

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JUNE 2009

Strongly recommended reading is marked with an asterisk. I'll make the computing exercises a little more concrete ahead of the class.

- **Monday morning, June 22.**

1. **The Euclidean Spatial Voting Model.**

- (a) Preferences and utility in \mathbb{R}^k . Quadratic loss; linear loss; Gaussian loss. [Enelow and Hinich \(1984\)](#). See also Chapters 1 and 2 in [Hinich and Munger \(1997\)](#)*.
- (b) Stochastic assumptions: what is random and why? ([Poole 2005](#), Chapter 4)*.

2. **Simple Statistical Analysis of Roll-Call Data.**

- (a) Factor analysis: [Lawley and Maxwell \(1971\)](#); [Mardia, Kent and Bibby \(1979\)](#); [Venables and Ripley \(2002\)](#). See the notes [on my web pages](#)*.
- (b) Application to roll call analysis: [Heckman and Snyder Jr. \(1997\)](#)*.

- **Monday afternoon, June 22.**

1. **Bayesian Inference for Latent Variable Models.**

- (a) Markov chain Monte Carlo: [Jackman \(2009](#), Chapter 9); see also my earlier review articles ([Jackman 2000a,b, 2004](#)).
- (b) Bayesian inference for item-response models: [Albert \(1992\)](#); [Johnson and Albert \(1999](#), Chapter 6)*.

2. **Fitting the Euclidean Spatial Voting Model via item-response theory models.**

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- Approaches based on approximations to the likelihood function: NOMINATE and variants (W-NOMINATE; DW-NOMINATE). [Poole and Rosenthal \(1997\)](#); [Poole \(2005\)](#); R package, `wnominate` ([Poole et al. 2007](#))*.
- CJR quadratic-normal model ([Clinton, Jackman and Rivers 2004a](#))*. R packages: `psc1`* ([Jackman 2008](#)), `MCMCpack`* ([Martin, Quinn and Park 2009](#)).
- WNOMINATE and CJR/QN compared. [Carroll et al. \(2009\)](#). [Clinton and Jackman \(2009\)](#).

- **Monday Lab exercise.**

- Reading roll call data using the `readKH` function in the R package, `psc1`. Screening for missingness.
- Double-centering. Forming correlation matrix. Eigen-decomposition. Factor analysis. Graphs of principal components, factor scores, etc.
- The `wnominate` package.
- The `ideal` function in `psc1`.

- **Tuesday morning, June 23. NOMINATE and IDEAL.**

- WNOMINATE and CJR/QN compared, continued. [Carroll et al. \(2009\)](#). [Clinton and Jackman \(2009\)](#). Sensitivity to priors. A Bayesian version of NOMINATE.
- Re-parameterization in terms of midpoints. See [Clinton and Jackman \(2009\)](#).
- Applications: Supreme Court. ([Martin and Quinn 2002](#))*; judicial panels ([Law 2004](#)); committees and administrative panels. Identification when the roll call matrix is sparse.
- Assessing goodness-of-fit. How many dimensions? Identification in higher dimensions. Contrast with eigen-analysis. [Jackman \(2001\)](#)*; [Rivers \(2003\)](#).

- **Tuesday afternoon, June 23: Applications and Extensions.**

- Inference for rank orders. Was Kerry the “Most Liberal Senator”? ([Clinton, Jackman and Rivers 2004b](#)). Was Obama the “Most Liberal Senator”? ([Jackman 2009](#), Example 9.2).
- The “party pressure” hypothesis:
 - Identification issues. The assumption that lop-sided votes are free of party pressure ([Snyder and Groseclose 2000](#))*. See also [Cox and Poole \(2002\)](#) and [McCarty, Poole and Rosenthal \(2001\)](#)*.
 - party switchers ([Nokken and Poole 2003](#)); cf [Clinton, Jackman and Rivers \(2004a\)](#).

- **Tuesday lab exercise.**

- Replication of Obama “most liberal senator” results.

2. Replication of Bayesian implementation of NOMINATE in WinBUGS/JAGS. See (Clinton and Jackman 2009).
3. Assessing dimensionality via inspection of bill parameters.
4. Examine the Specter party switch.

- **Wednesday morning, June 24: Extensions, continued.**

1. Dynamic Ideal Point Models: Martin and Quinn (2002)*.
2. Evolution of the Agenda. See Clinton and Mierowitz (2001)*.
3. Proposal Power. Londregan valence model (Londregan 2000).
4. Hierarchical Bayesian Models: linking constituency characteristics to legislative ideal points. Various Stanford dissertations. Contrast pre-Bayesian work by Bailey (2001). See the example in Clinton and Jackman (2009).
5. Recovering the Uncovered Set: Bianco, Jeliaskov and Sened (2004)*.

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