Generative Dynamics of Supreme Court Citations

Christian Schmid,* Ted Hsuan Yun Chen,[†] Bruce Desmarais,[†] and David Hunter*

*Dept. of Statistics, [†]Dept. of Political Science
Pennsylvania State University

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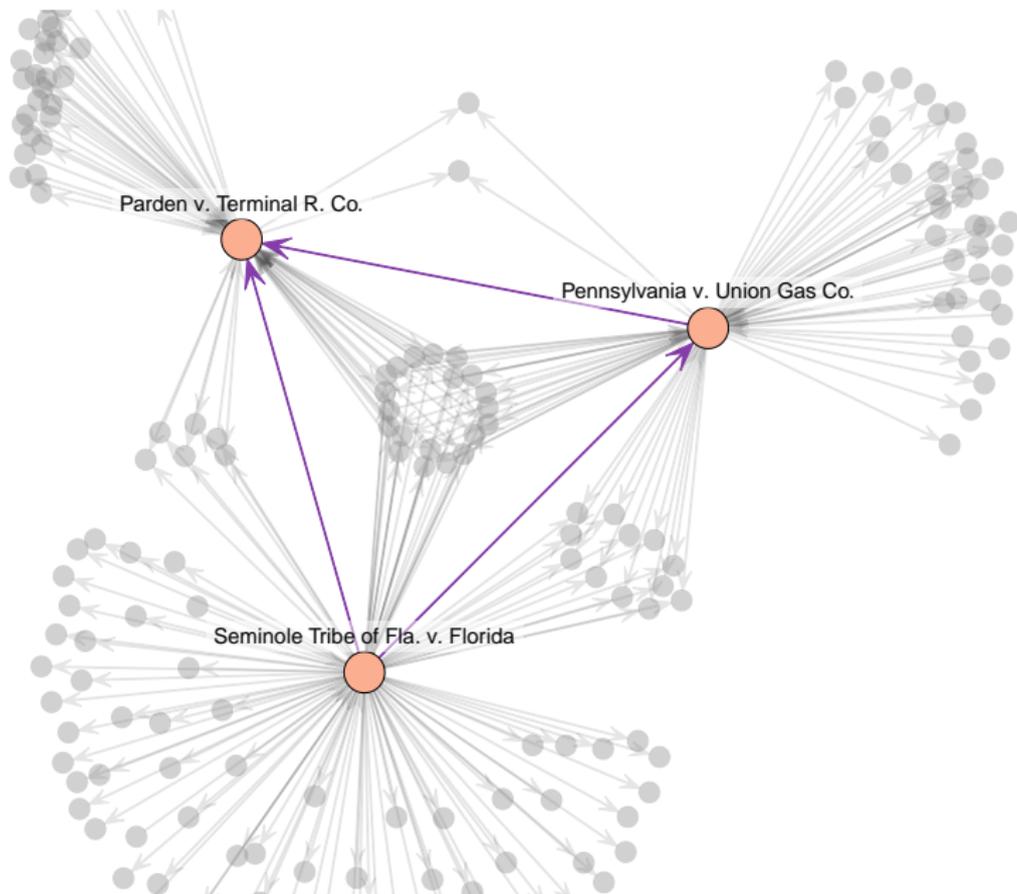# How to study supreme court citations?

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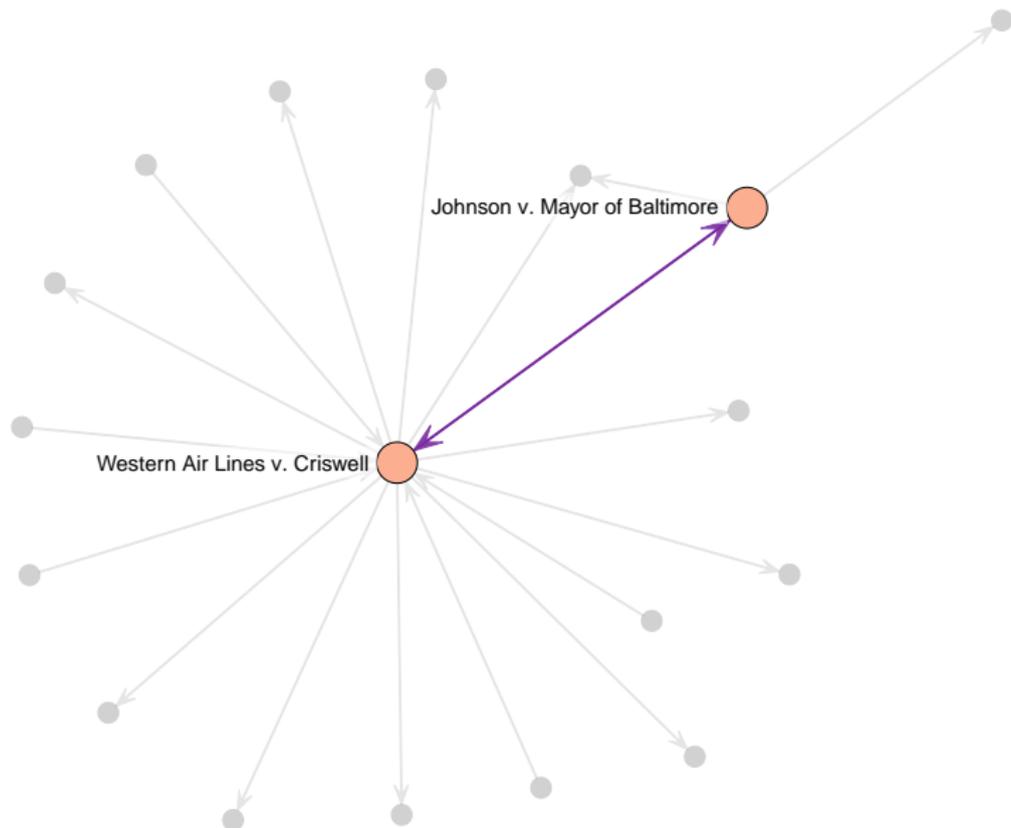
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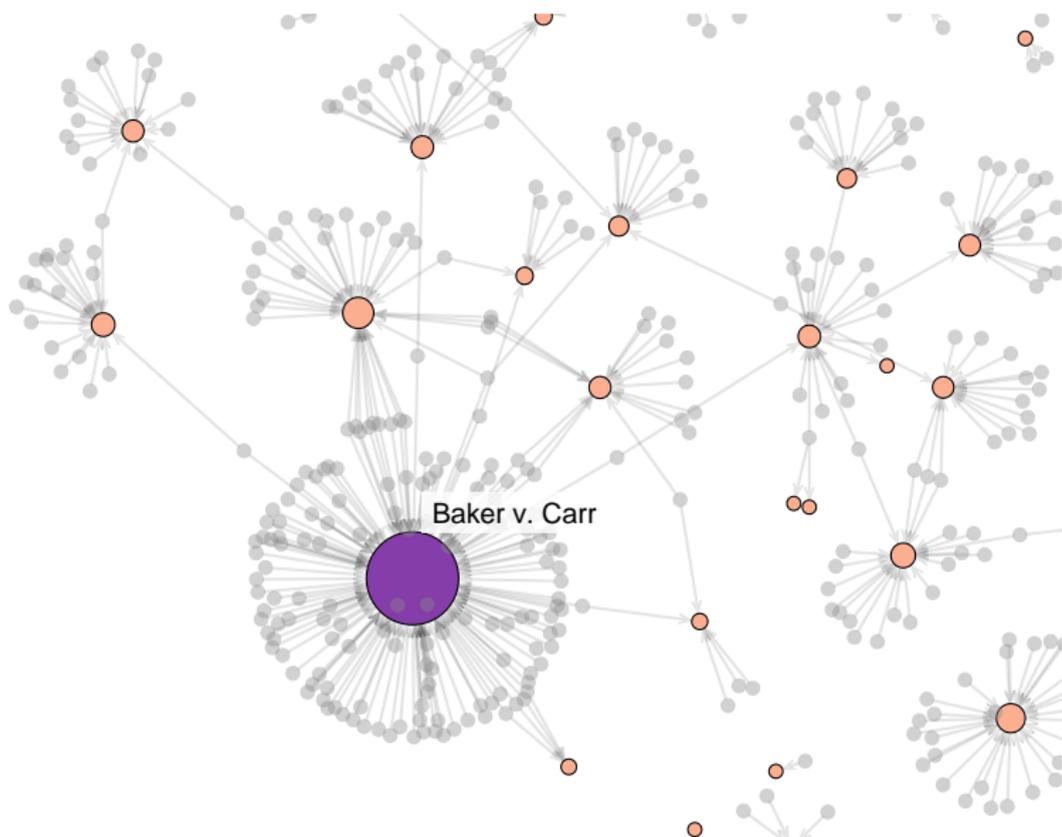We propose a dyadic, network-analytic approach.

Transitivity

Parden v. Terminal R. Co.

Pennsylvania v. Union Gas Co.

Seminole Tribe of Fla. v. Florida

Reciprocity

Popularity and Activity

Baker v. Carr

Characteristics of the Supreme Court Citation Network
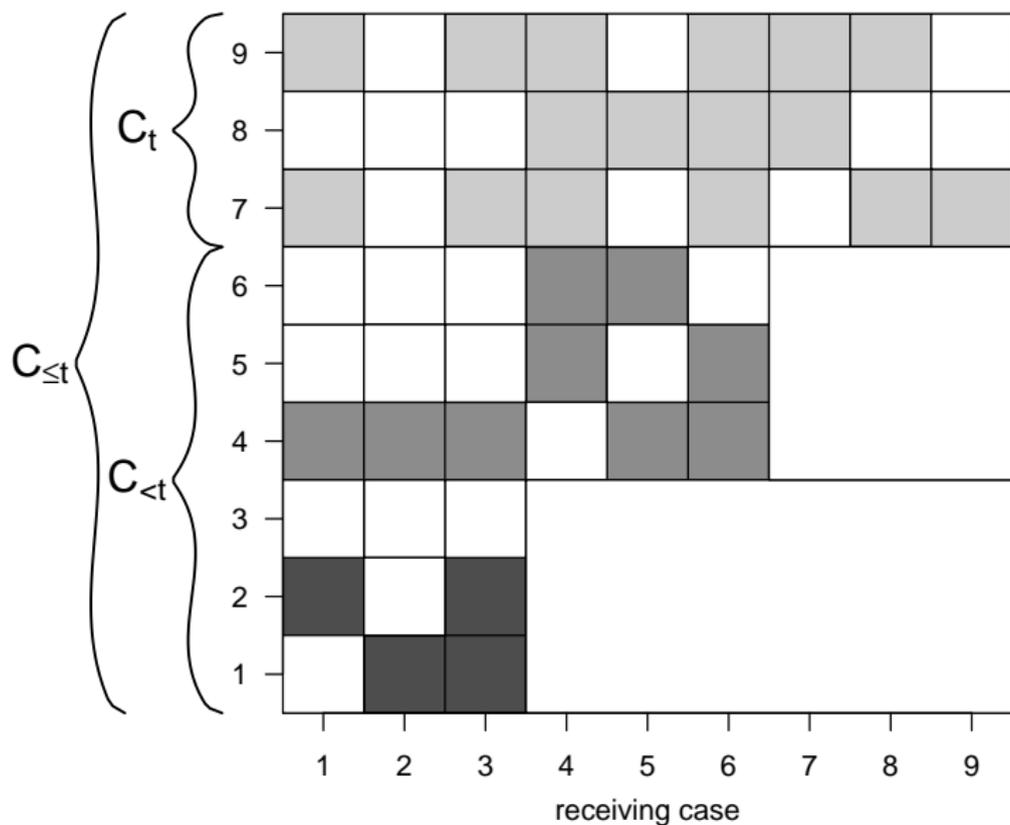
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- Edges can only be formed with nodes entry.

The Citation-TERGM

Data

	Terms	Cases
CE Hughes	1937 - 1941	629
HF Stone	1942 - 1946	766
FM Vinson	1946 - 1953	788
E Warren	1954 - 1969	2159
WE Burger	1970 - 1986	2805
W Rehnquist	1987 - 2005	2022
J Roberts	2006 - 2015	796
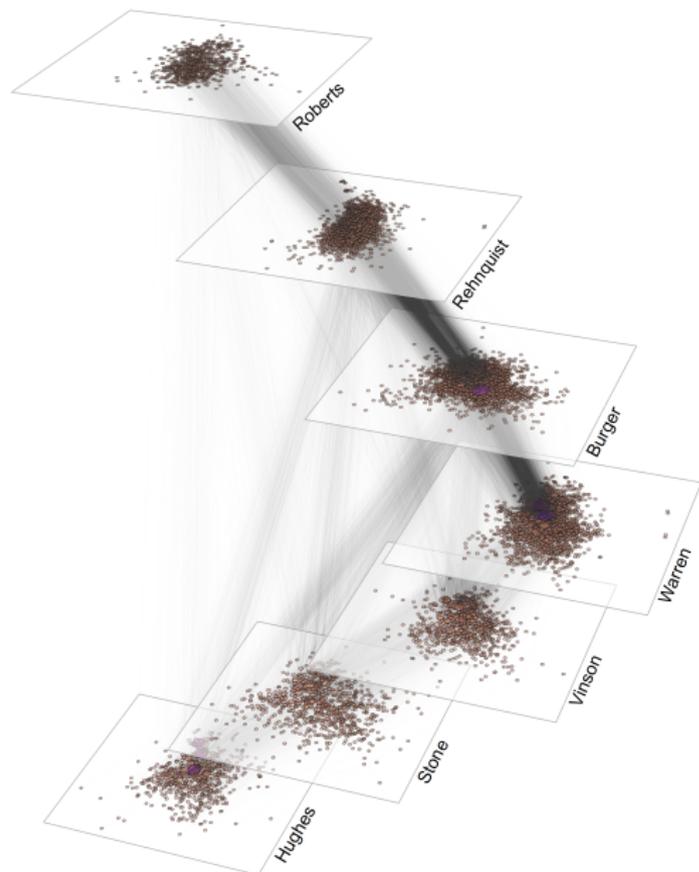
c-TERGM Specification

Dependence Effects

- ▶ # Transitive Ties
- ▶ # Out-two-stars

- ▶ # Mutual Dyads
- ▶ # In-two-stars

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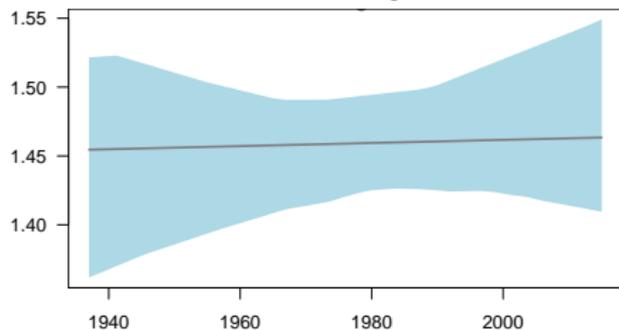
- \# Mutual Dyads
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Exogenous Effects

- Ideological Distance (dyad)
- Issue Area (sender; receiver; mixing matrix)
- Justice (sender; receiver; homophily)

- Age (receiver)
- Overruled Case (receiver)
- Majority size (receiver)
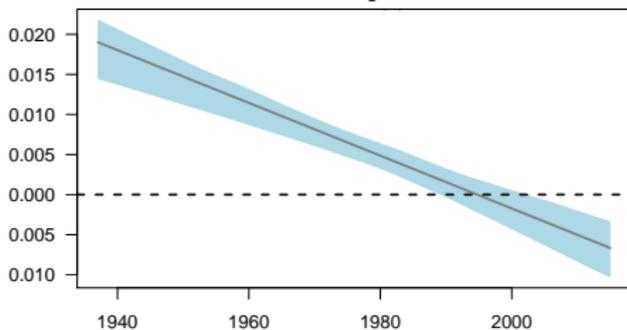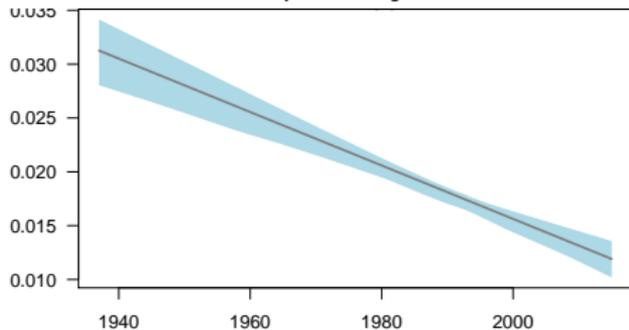- Ideological Breadth (receiver)

Results: Dependence Effects

Results: Predictive Performance
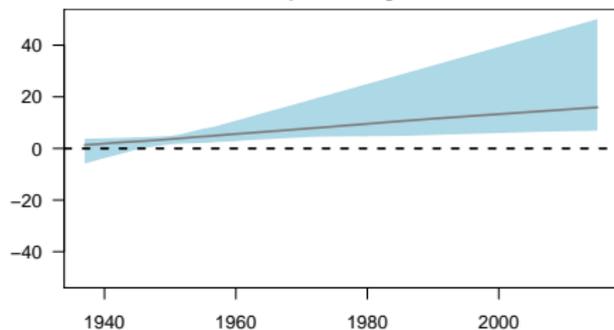
- Randomly split dyads 80/20 into training and test sets

- Estimate models using training set, then predict test set

- This process was repeat ten times
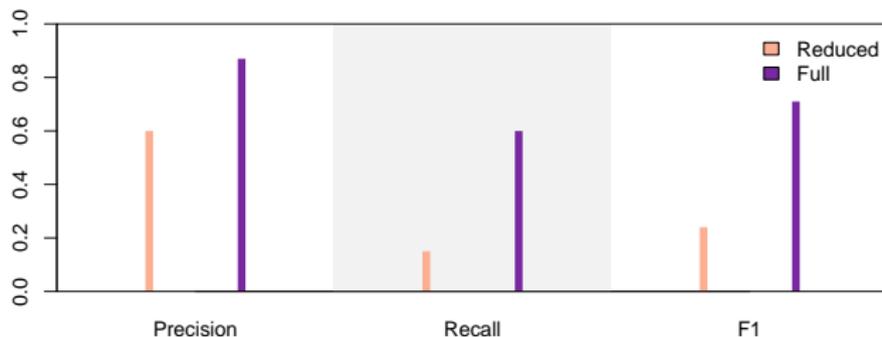
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1. Citation is characterized by reciprocity and transitivity

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2. Dependence effects improve models of citations
3. c-TERGM represents comprehensive method

Limitations

1. Do not consider the signs of the citations
2. We miss recent terms
3. Case emergence considered exogenous

Questions or Comments?

I can be reached at ted.hsuanyun.chen@gmail.com.

A copy of the slides will be available at my website: https://tedhchen.com
or our project github page:
https://github.com/desmarais-lab/Supreme_Court_Citation_Network.

Citation Temporal Exponential Random Graph Model

The likelihood of the c-TERGM is given by

$$l(\boldsymbol{\theta}, C_{\leq T}) = \prod_{t=1}^{T} \frac{\exp\left[\boldsymbol{\theta}'\mathbf{h}(C_t, C_{<t})\right]}{\sum_{C_t^* \in \mathcal{C}_t} \exp\left[\boldsymbol{\theta}'\mathbf{h}(C_t^*, C_{<t})\right]}. \tag{1}$$

Decomposition:

$$\underbrace{\mathbf{h}(C_t, C_{<t})}_{\text{Net Stats}} \qquad \underbrace{\boldsymbol{\theta}}_{\text{Effects}} \qquad \underbrace{\exp\left[\boldsymbol{\theta}'\mathbf{h}(C_t^*, C_{<t})\right]}_{+ \text{ Weight}} \qquad \underbrace{\sum_{C_t^* \in \mathcal{C}_t} \exp\left[\boldsymbol{\theta}'\mathbf{h}(C_t^*, C_{<t})\right]}_{\text{Normalizer}}$$

$\mathbf{h}$ can capture virtually any form of interdependence among the edges
+ covariates

Issue Areas

1 Criminal Procedure
2 Civil Rights
3 First Amendment
4 Due Process
5 Privacy
6 Attorneys
7 Unions

8 Economic Activity
9 Judicial Power
10 Federalism
11 Interstate Relations
12 Federal Taxation
13 Miscellaneous
14 Private Action