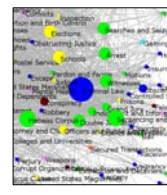
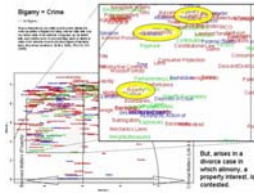
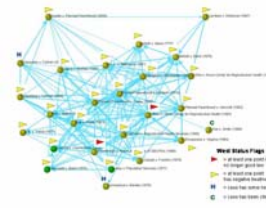


Visualizing the Topic Space of the United States Supreme Court



Peter A. Hook, J.D., M.S.L.I.S.
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 Indiana University School of Law—Bloomington
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<http://ella.slis.indiana.edu/~pahook>
 June 25, 2007, ISSI 2007
 Madrid, Spain



Impact of the Legal Information Infrastructure

Frank Shepard's
Legal Citators



Illinois Citations, (1875)



Gene Garfield's
Citators



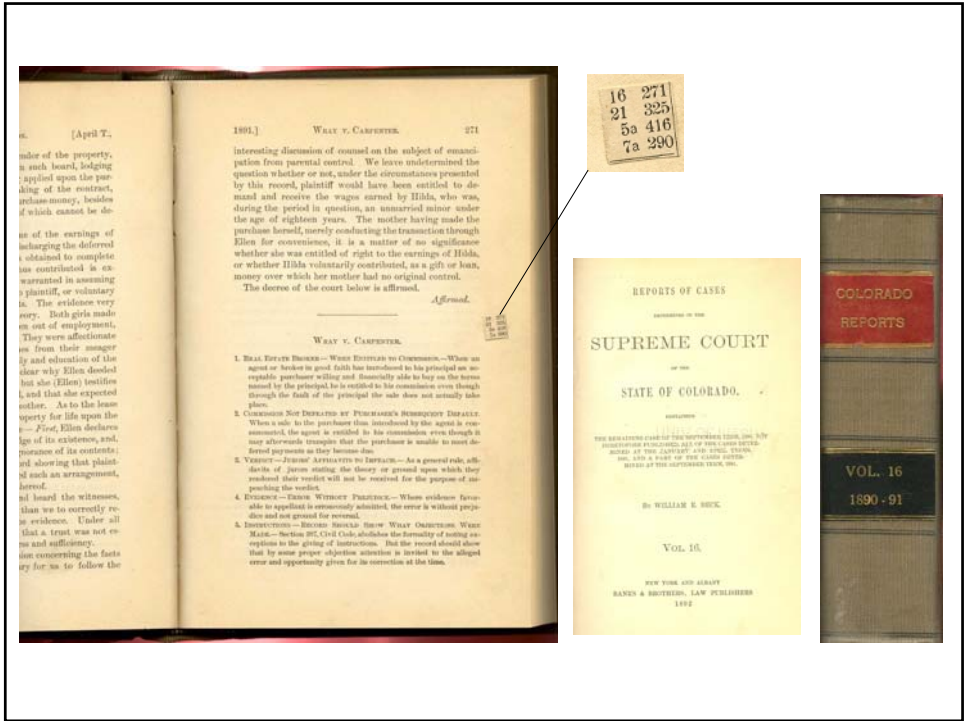
(1950's)



Inspired Page and
Brin's PageRank
Relevance
Algorithm which
powers Google



(1996)



—501—

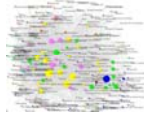
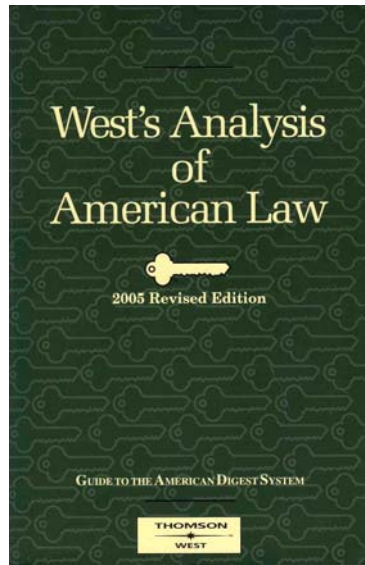
253Kan724
e 253Kan725
f 255Kan2164
d 255Kan1174
255Kan516
j 264Kan638
d 264Kan794
269Kan118
f 269Kan216
f 18KA2d143
e 19KA2d24

84FS2d21213
106FS2d1200
114FS2d1146
159BRW948
64JBK(2)23
67JBK(2)28
99CR334
83MnL335
84MnL897
17AE10n

Case Name	Citation	Bound	App	Sup	U.S. Ct	How used
William O'Connell v. William L. Bluff	475 U.S. 172			✓	✓	See commentaries on this case. New case = 6.5
City of Anniston	680 F. Supp. 211			diagonal	U.S.C.	
City of Anniston	723 F.2d 111			diagonal	U.S.C.	

Shepard's
Judge: Russell
Case Name Citation Bound App Sup U.S. Ct How used

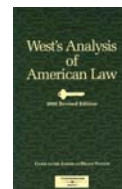
Relational Infrastructure of the Law (Topic Assignments)



Research Question

- **Question:** What are the topical adjacencies of subjects addressed by the United States Supreme Court based on the co-occurrence of top level topics assigned by West Publishing?

Goal: To create a rigorous substrate map on which to layer 60 years worth of data.



- **Techniques:** Principal Component Analysis (PCA), Multidimensional Scaling (MDS)

About the Dataset



- Co-occurrence counts of topics assigned by West Publishing to United States Supreme Court cases
- October 1944 - July 2005
- 7,948 unique cases
- 19,789 topic assignments
- 405 top level topics in the West taxonomy
- 290 appear in Supreme Court cases during this time period.
- 289 co-occur with other topics (all but Reference)
- 3743 unique topic pairings (out of a possible 83,521 (289 * 289))
- Sparse matrix

U.S. v. Kozminski,
487 U.S. 931 (U.S. Mich., 1988).

356 Slaves

356 k24 k. Abolition of Slavery; Peonage.

Record contained sufficient evidence of physical or legal coercion to support conviction for holding mentally retarded men on farm in involuntary servitude and conspiring to interfere with their Thirteenth Amendment right to be free from involuntary servitude.

91 Conspiracy

911 Criminal Responsibility
 911(A) Offenses
 91k29.5 Conspiracy Against Exercise of Civil Rights
 91k29.5(2) k. Rights or Privileges Involved.
 (Formerly 91k29.6)

Statute prohibiting conspiracy to interfere with right secured by Constitution or laws of United States incorporates prohibition of involuntary servitude contained in Thirteenth Amendment.

361 Statutes

110 Criminal Law

487 U.S. 931

U.S. v. KOZMINSKI
Cite as 188 S.Ct. 271 (1988)

2751

Stevens, J., concurred in judgment and filed opinion joined by Blackmun, J.

1. Statutes \Leftarrow 241(1)
Federal crimes are defined by Congress, and so long as Congress acts within its constitutional power in enacting criminal statute, Supreme Court must give effect to Congress' expressed intention concerning scope of prohibited conduct.

2. Conspiracy \Leftarrow 29.6
Statute prohibiting conspiracy to interfere with right secured by Constitution or laws of United States incorporates prohibition of involuntary servitude contained in Thirteenth Amendment. 18 U.S.C. § 241; U.S.C.A. Const. Amend. 13.

3. Conspiracy \Leftarrow 29.6
Statutory prohibition against involuntary servitude does not create individual right or privilege within meaning of statute prohibiting conspiracy to interfere with right or privilege secured by Constitution or laws of United States. 18 U.S.C. §§ 241, 1584; U.S.C.A. Const. Amend. 13.

4. Conspiracy \Leftarrow 29.6
Statute prohibiting conspiracy to interfere with right secured by Constitution or laws of United States creates no substantive right, but prohibits interference with rights established by Constitution or laws and by decisions interpreting them. 18 U.S.C. § 241.

5. Slaves \Leftarrow 24
Not all situations in which labor is compelled by physical coercion or force of

18. Conspiracy \Leftarrow 47(3)
Slaves \Leftarrow 24
Record contained sufficient evidence of physical or legal coercion to support conviction for holding mentally retarded men on farm in involuntary servitude and conspiring to interfere with their Thirteenth Amendment right to be free from involuntary servitude. 18 U.S.C. §§ 241, 1584; U.S.C.A. Const. Amend. 13.

487 U.S. 954

U.S. v. KOZMINSKI
Cite as 188 S.Ct. 271 (1988)

2765

III

[13-15] Absent change by Congress, we hold that, for purposes of criminal prosecution under § 241 or § 1584, the term "involuntary servitude" necessarily means "condition of servitude in which the victim is forced to work for the defendant by the use or threat of physical restraint or physical injury, or by the use or threat of coercion through law or the legal process. This definition encompasses those cases in which the defendant holds the victim in servitude by placing the victim in fear of such physical restraint or injury or legal coercion. Our holding does not imply that evidence of other means of coercion, or of poor working conditions, or of the victim's special vulnerabilities is irrelevant in a prosecution under these statutes. As we have indicated, the vulnerabilities of the victim are relevant in determining whether the physical or legal coercion or threats thereof could plausibly have compelled the victim to serve. In addition, a trial court could properly find that evidence of other means of coercion or of extremely poor working conditions is relevant to corroborate disputed evidence regarding the use or threatened use of physical or legal coercion, the defendant's intention in using such means, or the causal effect of such conduct. We hold only that the jury must be instructed that compulsion of services by the use or threatened use of physical or legal coercion is a necessary incident of a condition of involuntary servitude.

[16] The District Court's instruction on involuntary servitude, which encompassed other means of coercion, may have caused the Kozminski to be convicted for conduct that does not violate either statute. Accordingly, we agree with the Court of Appeals that the convictions must be reversed and the case remanded for a new trial.

1. The District Court instructed the jury to incorporate the definition of "involuntary servitude" from § 1584 into 18 U.S.C. § 241. The parties did not challenge this incorporation either below or in this Court, but rather argued only that the § 1584 definition the District Court incorpo-

[17, 18] We disagree with the Court of Appeals to the extent it determined that a defendant could violate § 241 or § 1584 by means other than the use or threatened use of physical or legal coercion where the victim is a minor, an immigrant, or one who is mentally incompetent. But because we believe the record contains sufficient evidence of physical or legal coercion to enable a jury to convict the Kozminski even under the stricter standard of involuntary servitude that we announce today, we agree with the Court of Appeals that a judgment of acquittal is unwarranted.

The judgment of the Court of Appeals is affirmed, and the case is remanded for further proceedings consistent with this opinion.

It is so ordered.

Justice BRENNAN, with whom Justice MARSHALL joins, concurring in the judgment.

I agree with the Court that the construction given 18 U.S.C. § 1584 by the District Court and the Government either sweeps beyond the intent of Congress or fails to define the criminal conduct with sufficient specificity, and that a new trial under different instructions is therefore required. I cannot, however, square the Court's decision to add a physical or legal coercion limitation to the statute with either the statutory text or legislative history, and would adopt a different statutory construction that, I think, defines the crime with sufficient specificity but comports better with the evident intent of Congress.

It is common ground among the parties and all the courts and Justices that have interpreted § 1584¹ that it encompasses, at

1. The District Court instructed the jury to incorporate the definition of "involuntary servitude" from § 1584 into 18 U.S.C. § 241. The parties did not challenge this incorporation either below or in this Court, but rather argued only that the § 1584 definition the District Court incorpo-

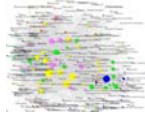
2. The District Court instructed the jury to incorporate the definition of "involuntary servitude" from § 1584 into 18 U.S.C. § 241. The parties did not challenge this incorporation either below or in this Court, but rather argued only that the § 1584 definition the District Court incorpo-



Top 40 Topics

(Number of Cases they appear in out of 7,948 total)

3032	Federal Courts	169	Jury
2294	Constitutional Law	164	Injunction
1231	Criminal Law	153	Elections
785	Statutes	144	Armed Services
564	Labor Relations	140	Aliens
526	States	135	Bankruptcy
510	Commerce	134	Schools
488	Courts	131	Arrest
447	Federal Civil Procedure	131	Double Jeopardy
432	United States	122	Eminent Domain
420	Civil Rights	120	Municipal Corporations
398	Internal Revenue	119	Indians
378	Habeas Corpus	113	Declaratory Judgment
370	Administrative Law and Procedure	110	Action
262	Monopolies	106	Social Security and Public Welfare
261	Sentencing and Punishment	101	Evidence
239	Searches and Seizures	100	War and National Emergency
200	Witnesses	90	Trade Regulation
192	Taxation	90	Environmental Law
184	Judgment	85	Telecommunications

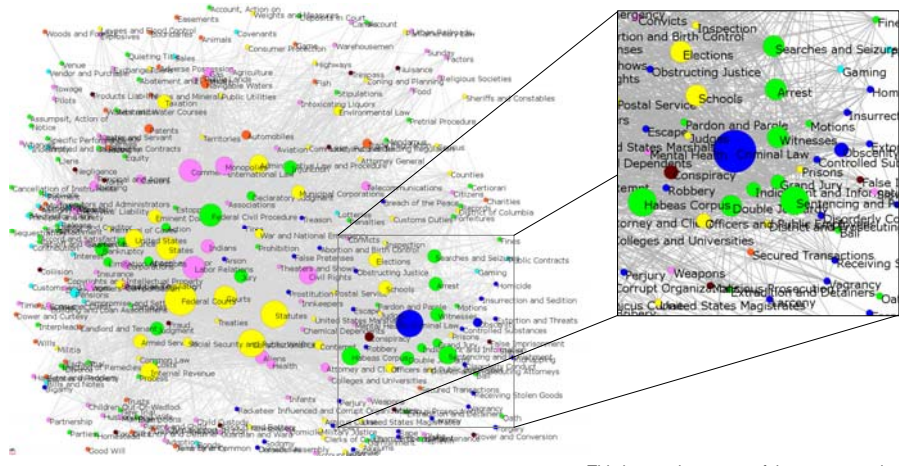


Bottom 40 Topics

(Number of Cases they appear in out of 7,948 total)

2	Chemical Dependents	1	Homestead
1	Accord and Satisfaction	1	Innkeepers
1	Account	1	Joint Tenancy
1	Account, Action on	1	Motions
1	Assumpsit, Action of	1	Notaries
1	Asylums	1	Parliamentary Law
1	Bigamy	1	Parties
1	Bonds	1	Penalties
1	Boundaries	1	Reference
1	Cancellation of Instruments	1	Sequestration
1	Cemeteries	1	Slaves
1	Champerty and Maintenance	1	Tenancy in Common
1	Clubs	1	Trover and Conversion
1	Deposits in Court	1	United States Marshals
1	Dower and Curtesy	1	Vendor and Purchaser
1	Easements	1	Weights and Measures
1	Explosives	1	Wharves
1	False Pretenses	1	Wills
1	Forgery	1	Woods and Forests
1	Good Will	1	Urban Railroads

Previous Work (2004) – Pajek Rendering of the Dataset



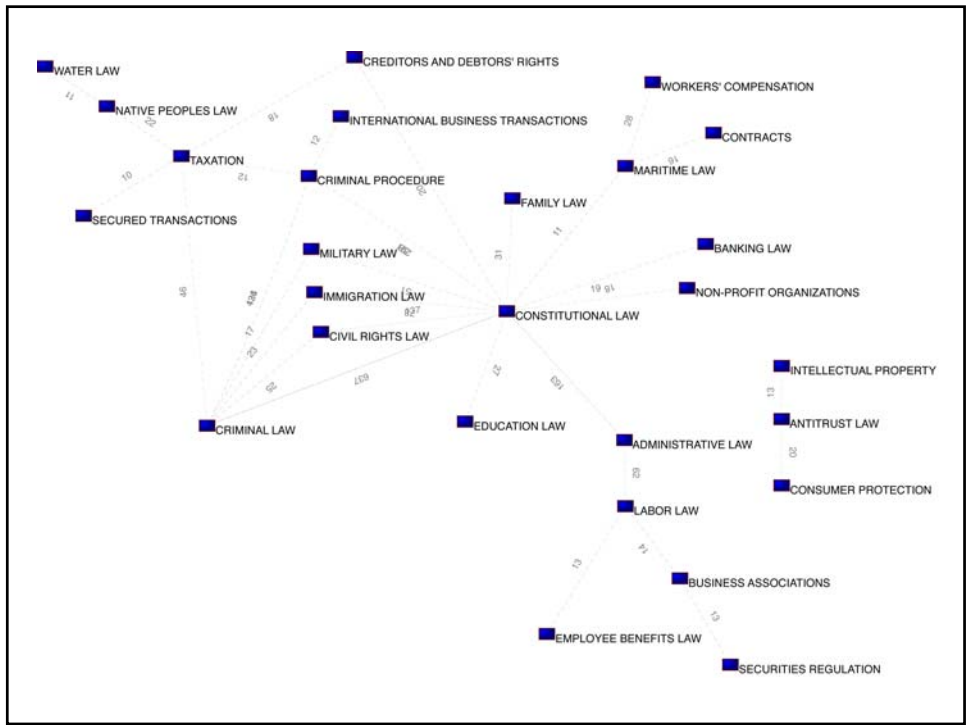
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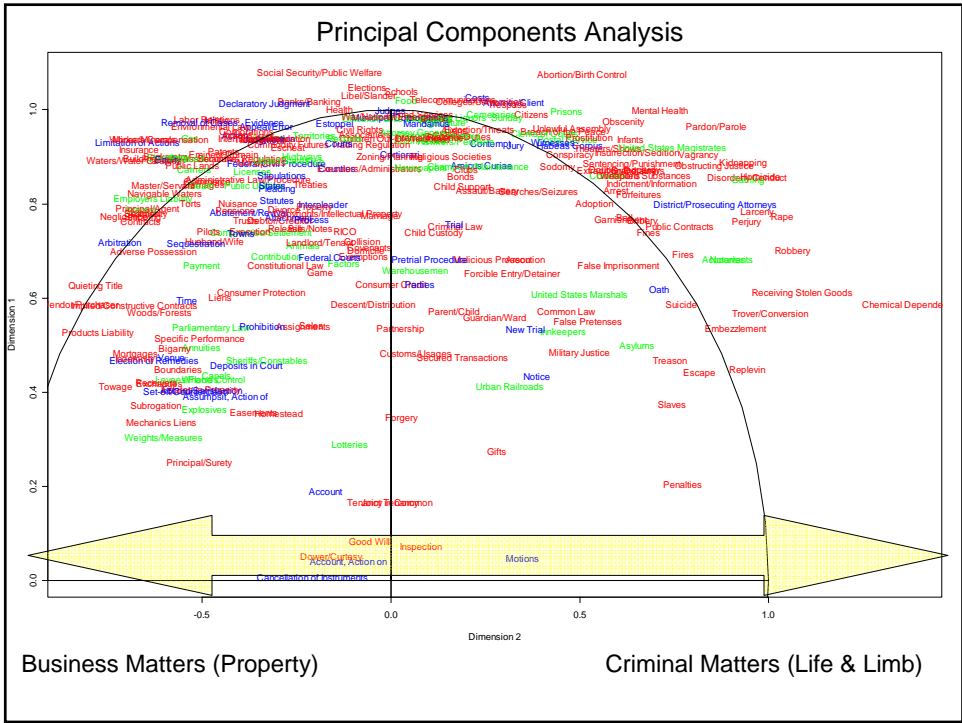
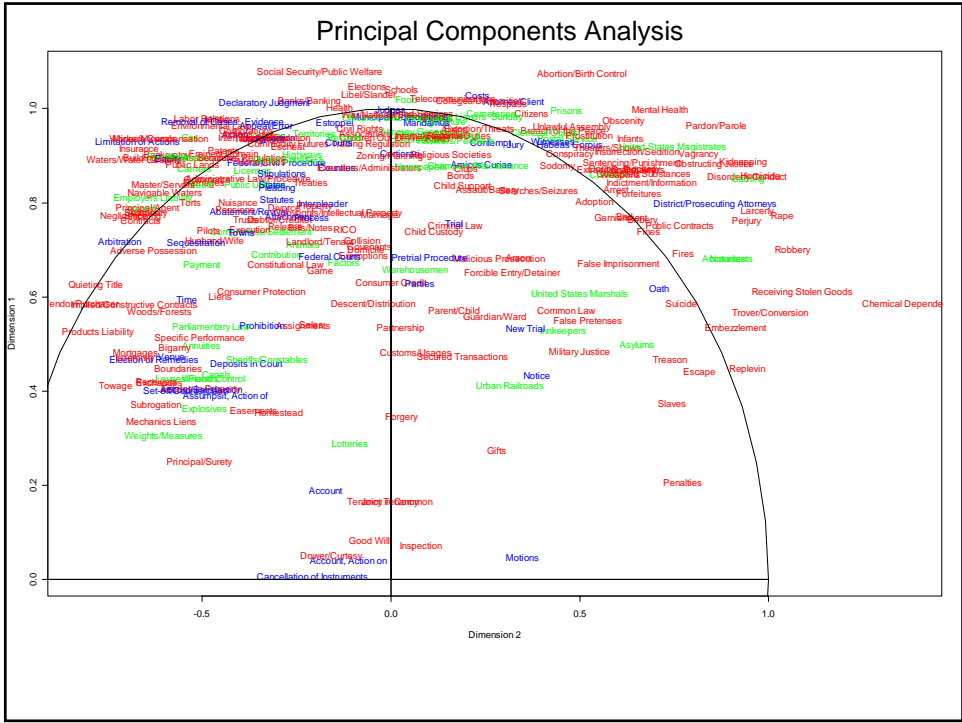
- 1. Persons
- 2. Property
- 3. Contracts
- 4. Torts
- 5. Crimes
- 6. Remedies
- 7. Government

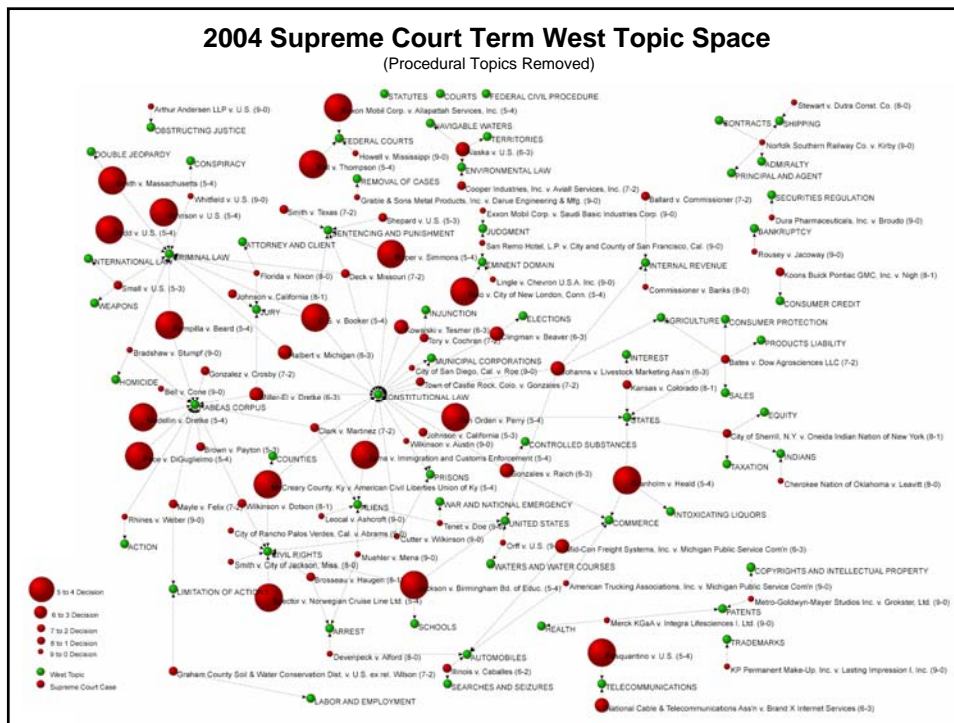
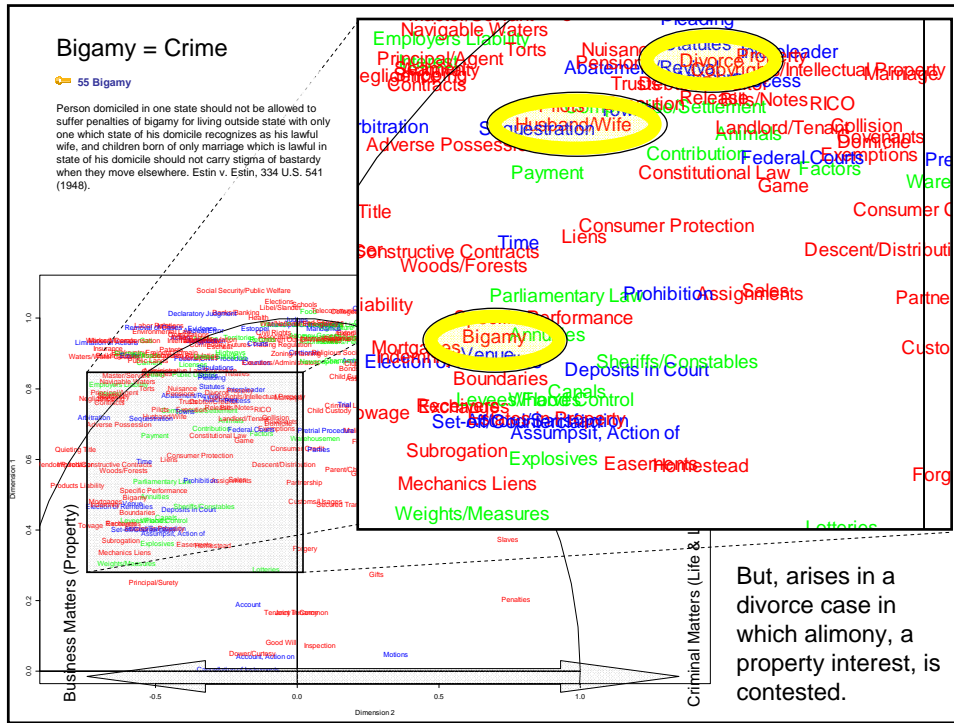
Node Size – Number of times topic appears in the dataset

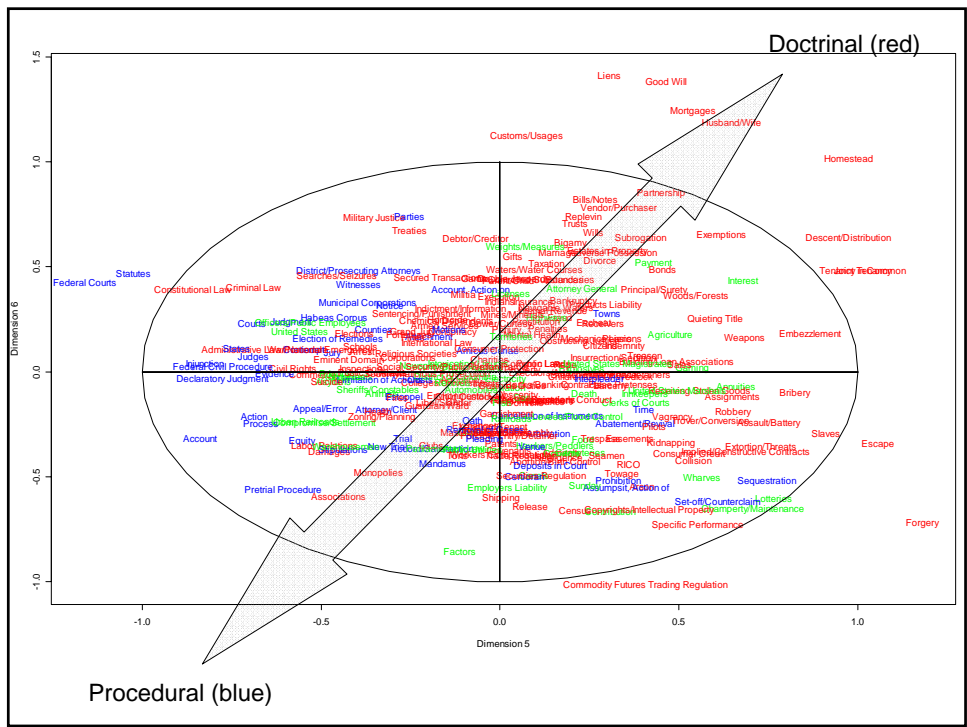
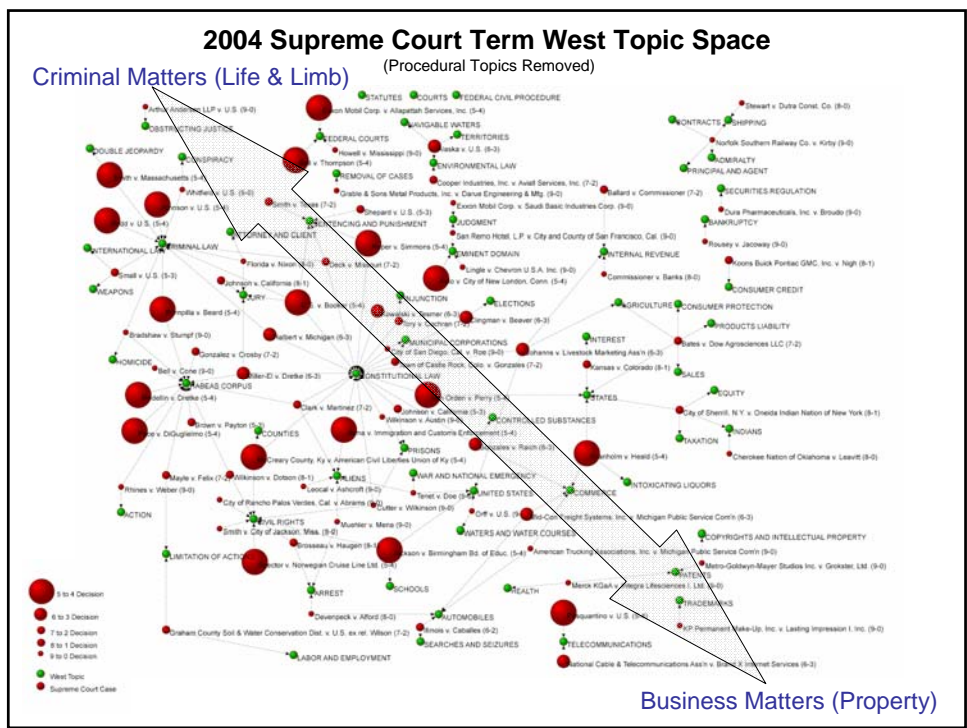
Node Color – West Category

This is an enlargement of the area around the Criminal Law node. Interestingly, the node closely clusters with a number of procedural topics (in green). While grouped in different West categories (blue = Crimes, green = Remedies), it appears that Criminal Law more closely relates to some Remedies topics than Crimes topics.









Family Law Professors:

Professor Stephen A. Conrad
 B.A., Haverford College; M.A., Ph.D., Harvard University; J.D., Yale University. Attorney, Ropes & Gray, Boston, Massachusetts. Before becoming a lawyer, Professor Conrad became an historian. He still publishes as much in history journals as in law reviews. At Harvard, his history dissertation was about a school of eighteenth-century philosophy that greatly influenced the American Founding, especially the framing of our federal Constitution and early Supreme Court jurisprudence. As a student at the Yale Law School, Conrad pursued the connections between his history background and legal scholarship.

Professor Julia Lamber
 BA 1969, DePauw University; JD 1972, Indiana University. Note Editor, *Indiana Law Journal*. Attorney, U.S. Department of Health, Education, and Welfare, 1972-75. Faculty and Assistant Dean, University of Nebraska College of Law, 1977-79. Member, Order of the Coif. The former IU dean for women's affairs and a leading scholar in employment discrimination law, Professor Lamber brings a wealth of administrative experience and scholarship to the classroom. She has taught Administrative Law, Civil Rights Statutes, Employment Discrimination, Family Law, Women and the Law, and the Federal Courts Clinic.

Professor Aviva A. Orenstein
 AB 1981, Cornell University; JD 1986, Cornell Law School. Articles Editor, *Cornell Law Review*. Law Clerk, Hon. Edward R. Becker, U.S. Court of Appeals, Third Circuit, 1987-88. Faculty, Rutgers Law School, 1989-92. Member, Order of the Coif. Professor Orenstein writes and teaches in the area of evidence. Her current work examines special evidence rules that allow prosecutors to introduce evidence of a defendant's prior sexual offenses in rape and child molestation cases. Professor Orenstein also teaches Civil Procedure, Legal Profession, and Children and the Law. In 2000-2001, she directed the Child Advocacy Clinic, supervising law students who serve as guardians ad litem for children in contested custody cases. She has also served as a court-appointed special advocate for abused and neglected children.

INDIANA LAW
 INDIANA UNIVERSITY SCHOOL OF LAW - BLOOMINGTON

Harvard Law Review Supreme Court Statistics

500 [Vol. 118:457]

TABLE I (continued)
 (B2) VOTING ALIGNMENTS — NON-UNANIMOUS CASES*

	Rehnquist	Stevens	O'Connor	Scalia	Kennedy	Souter	Thomas	Ginsburg	Breyer
O	17	36	22	33	20	24	24	24	26
S	0	6	8	8	0	10	0	2	2
D	17	42	30	41	20	34	24	28	28
N	55	53	54	55	55	55	55	54	54
P	30.9	79.2	55.6	74.5	36.4	61.8	43.6	51.9	64.8
O	17	—	22	6	20	28	8	29	26
S	0	—	0	1	2	14	1	12	9
D	17	—	22	7	22	42	9	40	35
N	55	—	51	54	55	55	55	55	54
P	30.9	—	41.5	13.0	40.0	76.4	16.4	72.7	64.8
O	36	22	—	22	32	26	21	28	32
S	6	0	—	3	4	0	2	0	2
D	42	22	—	25	35	26	23	28	44
N	53	53	—	52	53	53	53	53	52
P	79.2	41.5	—	48.1	66.0	49.1	43.4	52.8	65.4
O	22	6	22	—	19	10	20	12	12
S	1	1	—	—	5	1	15	1	0
D	30	7	25	—	25	11	35	13	12
N	54	54	52	—	54	54	54	54	53
P	55.6	13.0	48.1	—	42.6	20.4	64.5	24.1	22.6
O	33	20	32	19	—	21	21	23	24
S	8	2	4	5	—	2	6	0	1
D	41	22	35	23	—	25	27	23	25
N	55	55	53	54	—	55	55	55	54
P	74.5	40.0	66.0	42.6	—	45.5	49.1	41.8	46.3
O	20	28	26	10	23	—	12	32	28
S	0	14	0	1	2	—	1	15	10
D	20	42	26	11	25	—	13	45	35
N	55	55	53	54	55	—	55	55	54
P	36.4	76.4	49.1	20.4	45.5	—	23.6	81.8	64.8
O	24	8	21	20	21	12	—	14	12
S	10	1	2	15	6	1	—	0	1
D	34	9	23	35	27	13	—	14	13
N	53	55	53	54	55	55	—	55	54
P	61.8	16.4	43.4	64.8	49.1	23.6	—	25.5	24.1
O	24	29	28	12	23	32	14	—	33
S	0	12	0	1	0	15	0	—	82
D	24	40	28	13	23	45	14	—	44
N	55	55	53	54	55	55	55	—	54
P	43.6	72.7	52.8	24.1	41.8	81.8	25.5	—	81.5
O	26	26	32	12	24	28	12	33	—
S	2	9	2	0	1	10	1	12	—
D	28	35	34	12	25	35	13	44	—
N	54	54	52	53	54	54	54	54	—
P	51.9	64.8	65.4	22.6	46.3	64.8	26.1	81.5	—

July 2, 2005 New York Times

Agreement Among Supreme Court Justices

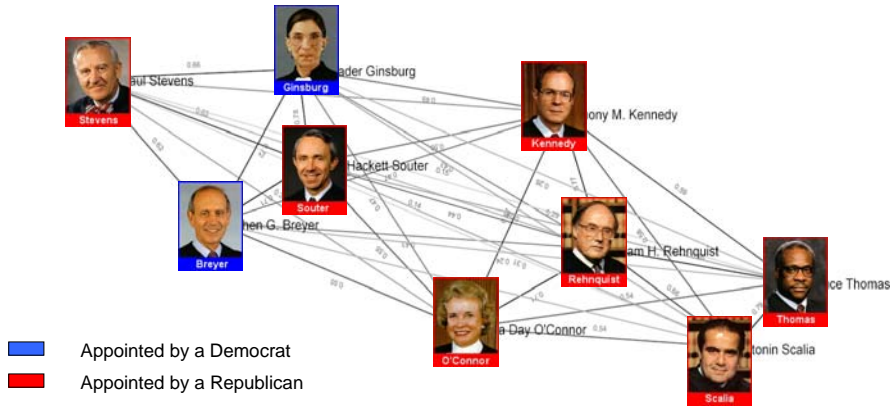
Percentage of times that justices agreed in non-unanimous cases from the 1994-95 term through the 2003-04 term.

Justice Sandra Day O'Connor was near the center of the court and was a swing vote on abortion and a host of other social issues.

Justices Antonin Scalia and John Paul Stevens were the least likely to be on the same side of a case, agreeing in only 14 percent of cases. Justices Scalia and Clarence Thomas had the highest agreement rate at 79 percent.

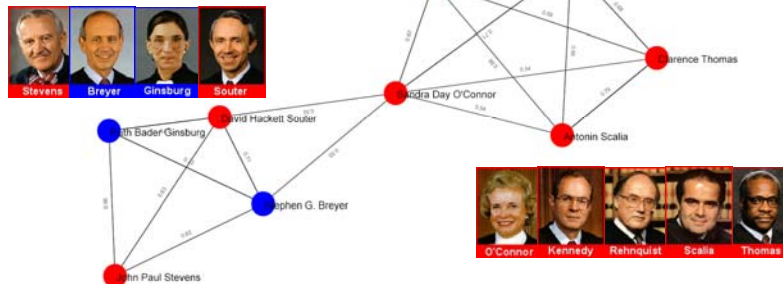
Source: Legal Affairs, Harvard Law Review

Ideological Landscape of the Justices (1994 – 2003)

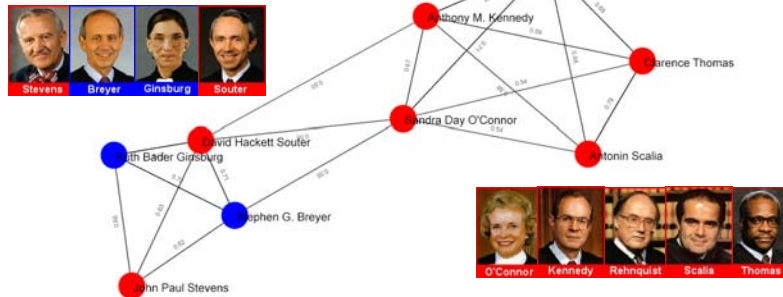


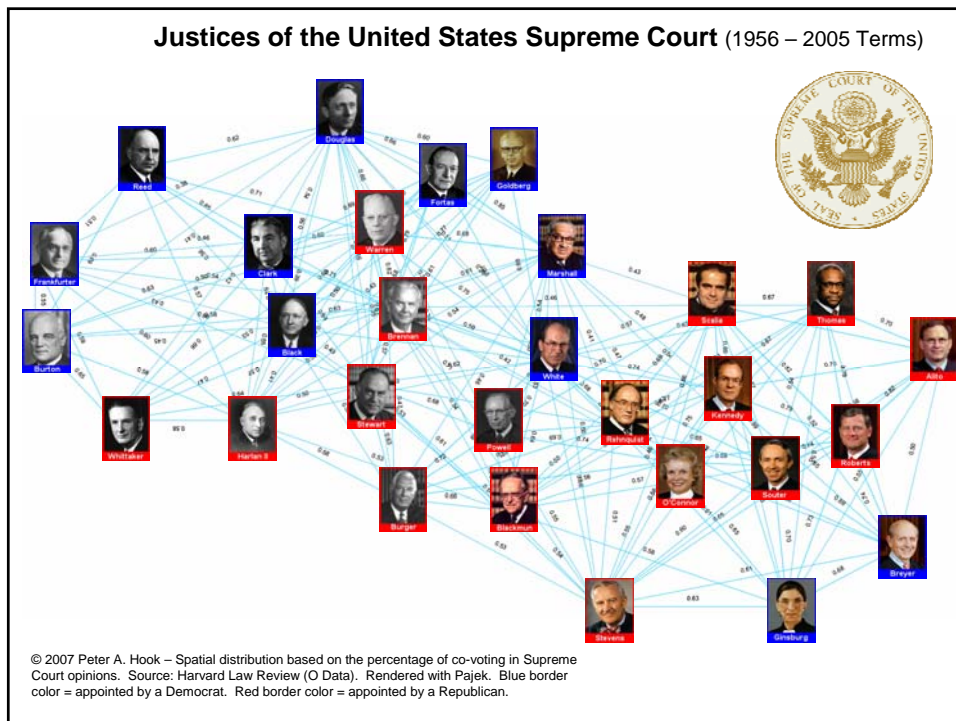
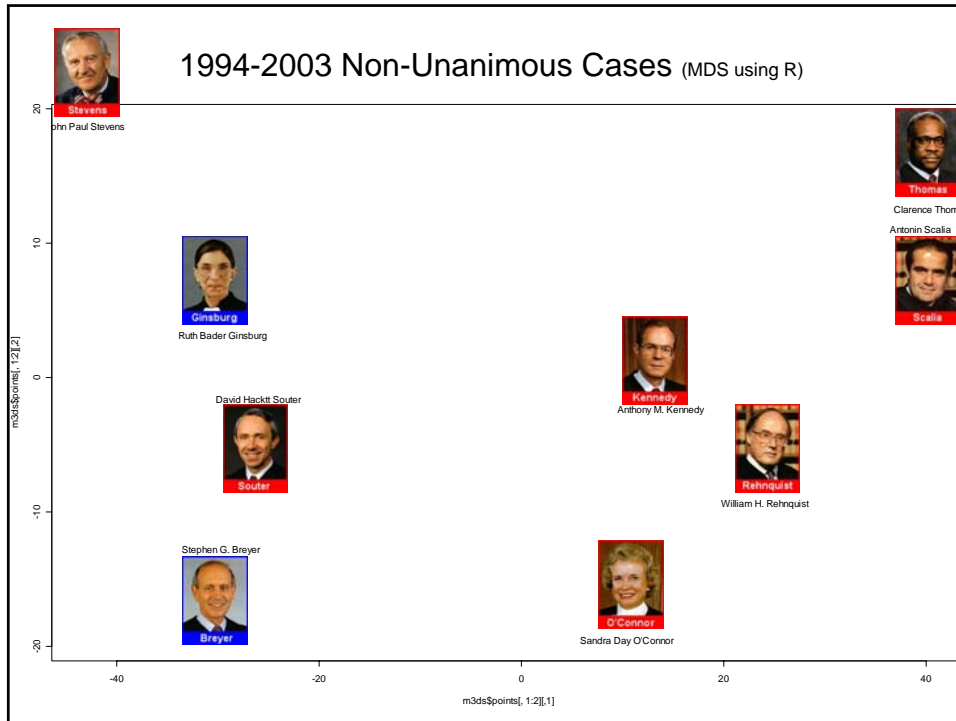
Voting frequencies represented as the edge weight between nodes and presented visually as a graph. (Rendered with Pajek using a stochastic, spring force algorithm.)

Voting Together > 50% (Non-Unanimous Cases 1994 -2003 Supreme Court Terms)

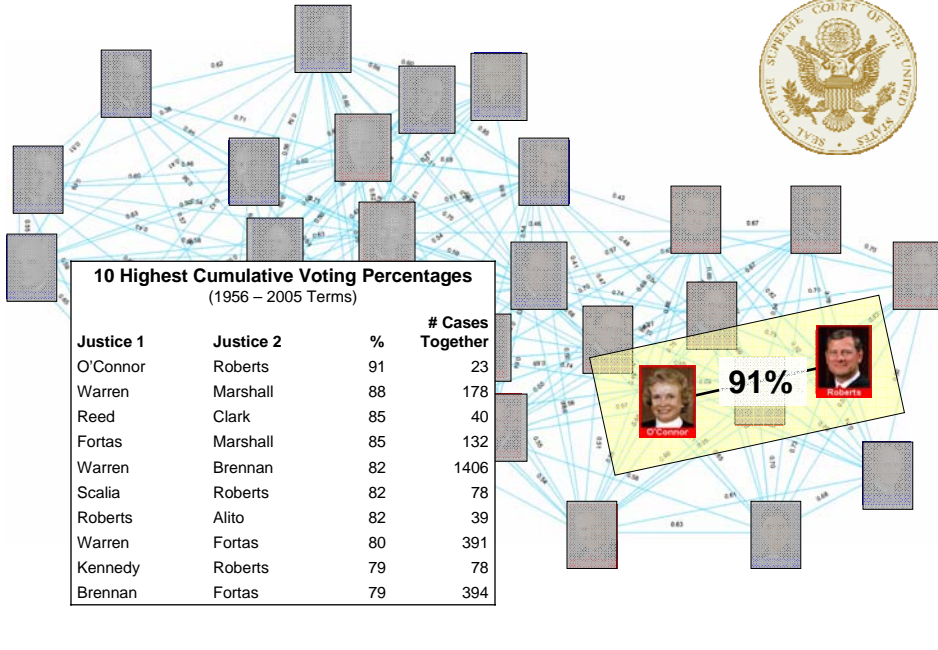


Voting Together > 49% (Non-Unanimous Cases 1994 -2003 Supreme Court Terms)





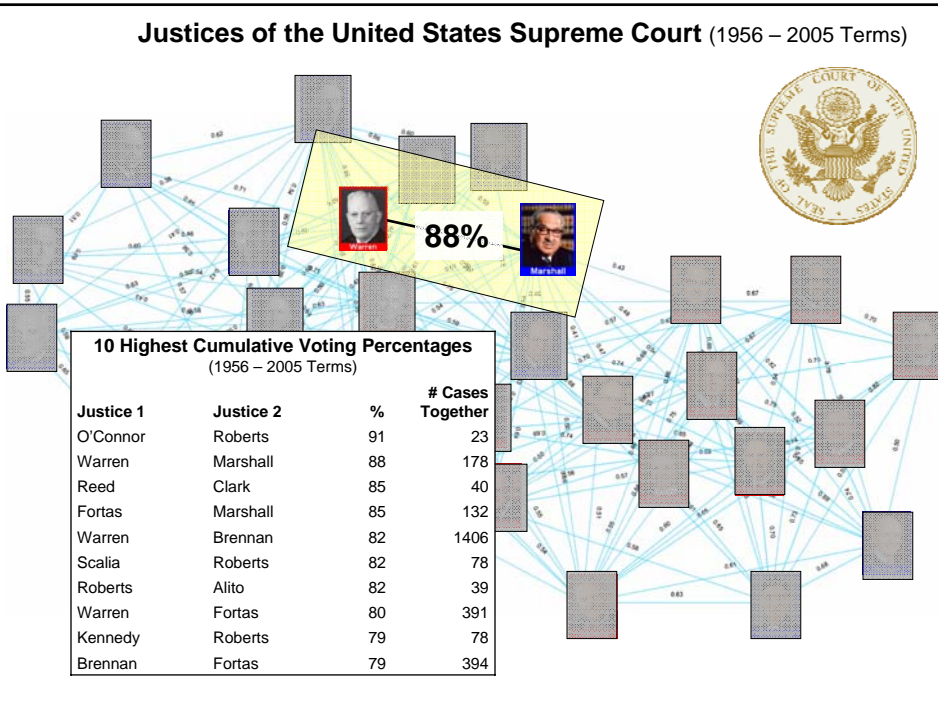
Justices of the United States Supreme Court (1956 – 2005 Terms)



10 Highest Cumulative Voting Percentages
(1956 – 2005 Terms)

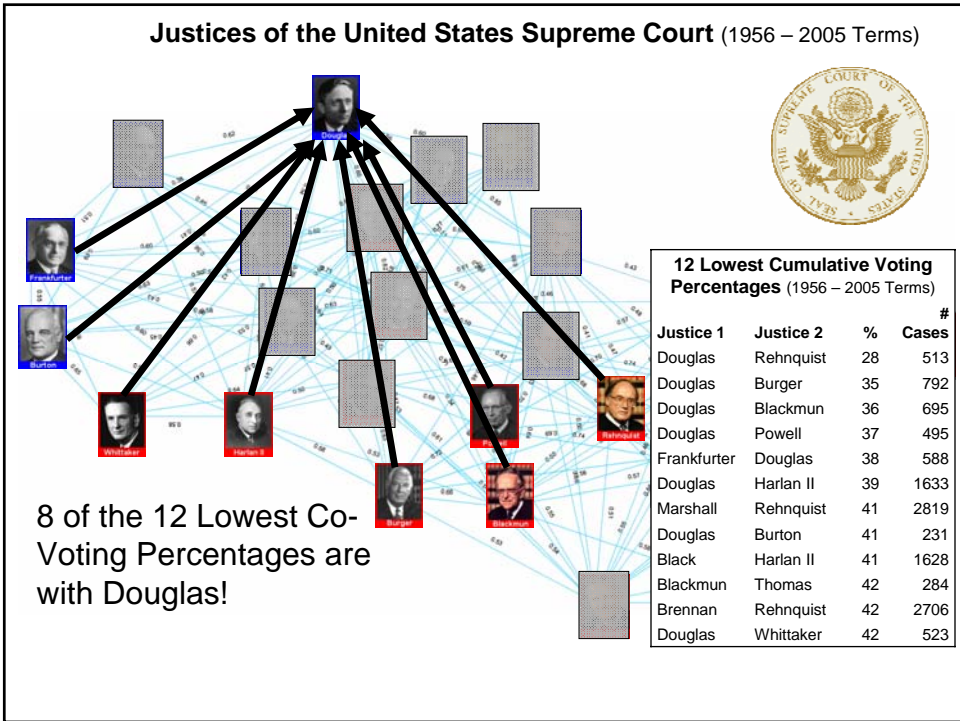
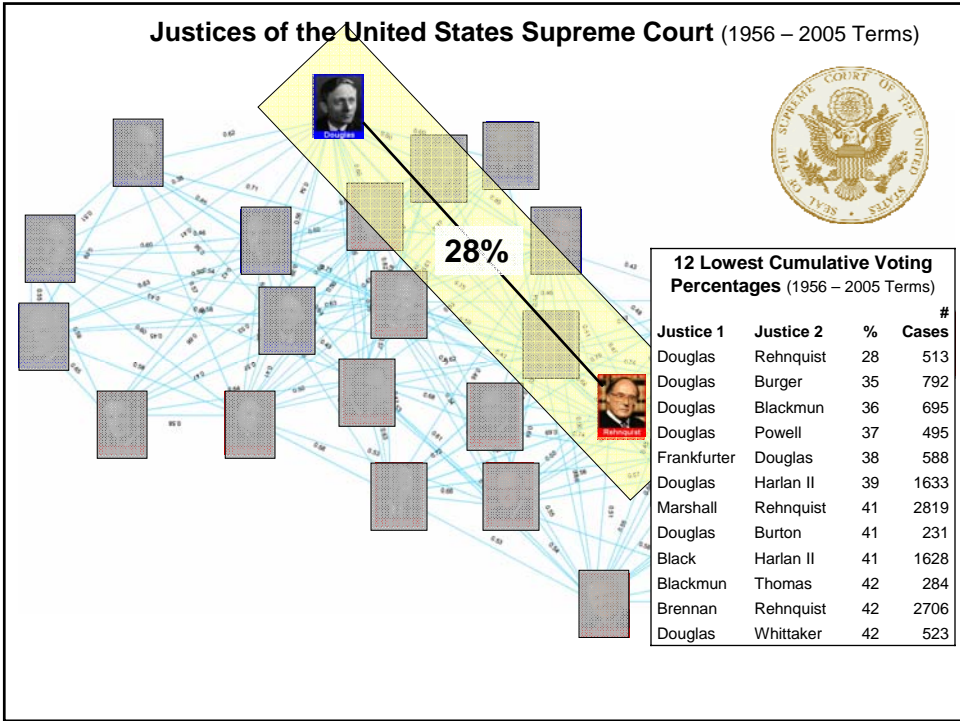
Justice 1	Justice 2	%	# Cases Together
O'Connor	Roberts	91	23
Warren	Marshall	88	178
Reed	Clark	85	40
Fortas	Marshall	85	132
Warren	Brennan	82	1406
Scalia	Roberts	82	78
Roberts	Alito	82	39
Warren	Fortas	80	391
Kennedy	Roberts	79	78
Brennan	Fortas	79	394

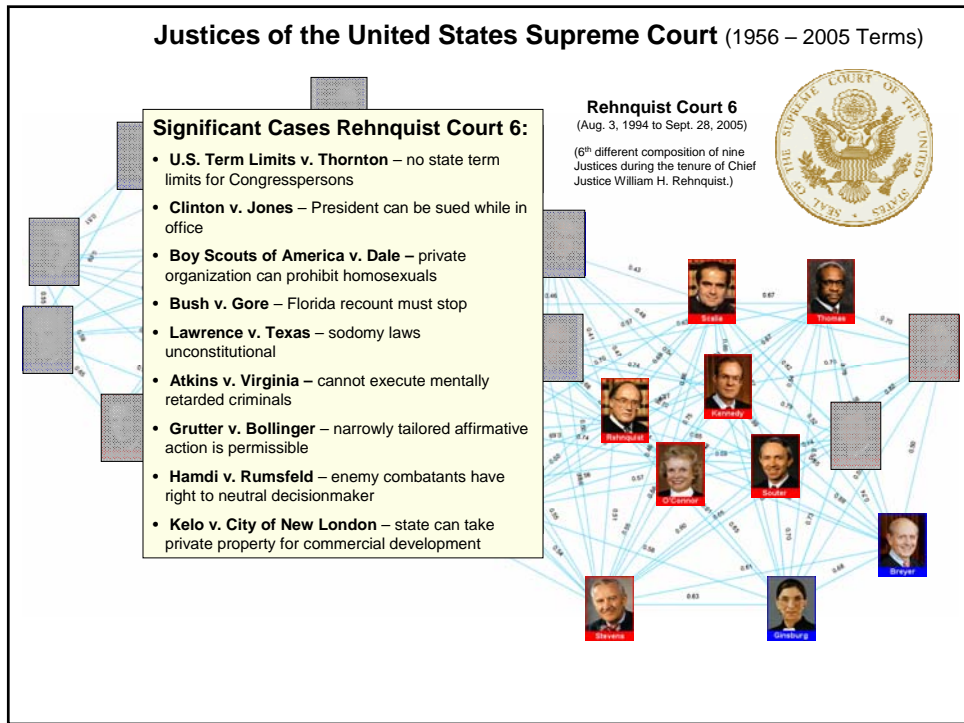
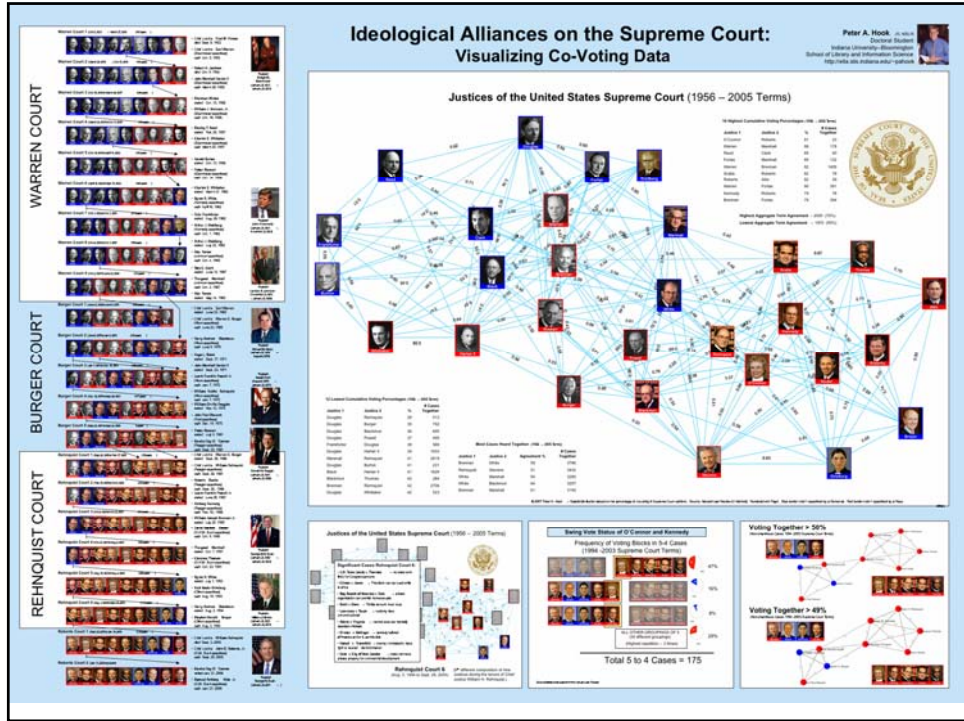
Justices of the United States Supreme Court (1956 – 2005 Terms)



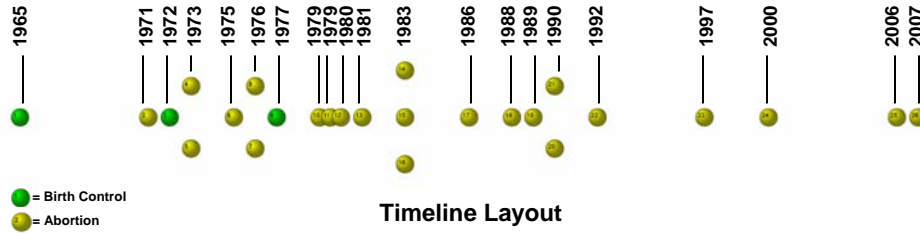
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Kennedy	Roberts	79	78
Brennan	Fortas	79	394

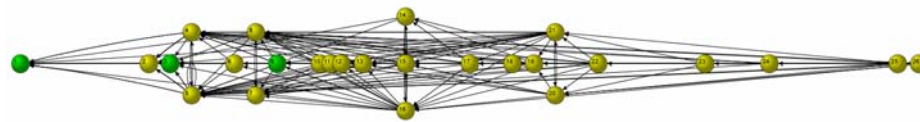




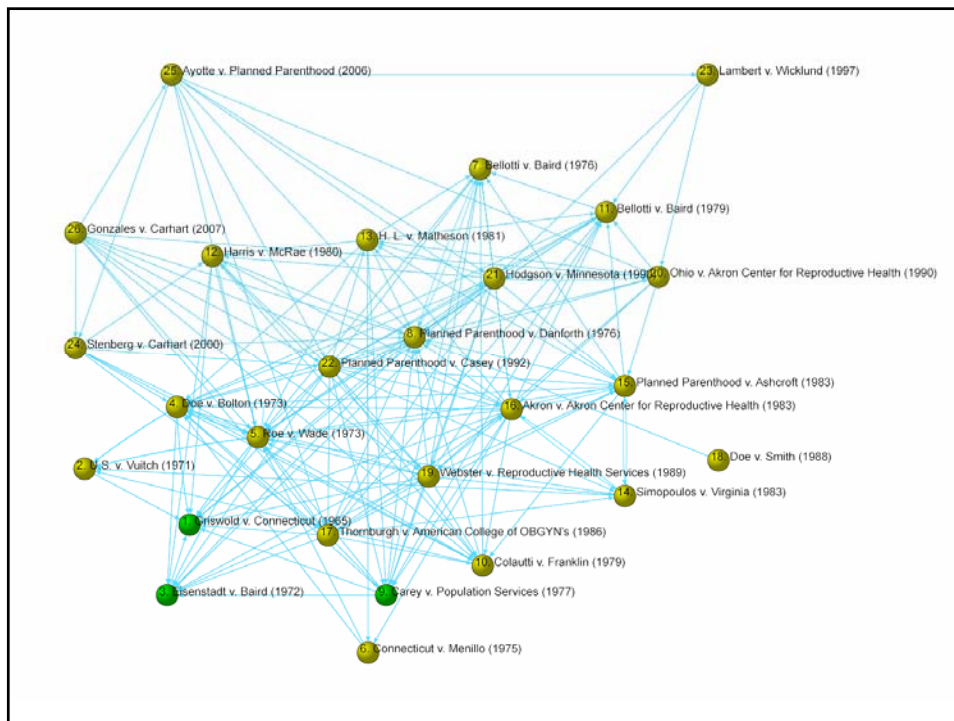
26 "Abortion and Birth Control" Cases in the S.Ct.



Timeline Layout



Timeline Layout with Citation Inter-linkages



Relational Infrastructure of the Law (Depth of Treatment)

KeyCite

Roe v. Wade
410 U.S. 113, 93 S.Ct. 709
U.S. Sup. Ct. 1973
January 22, 1973

First Part | Next Part >>

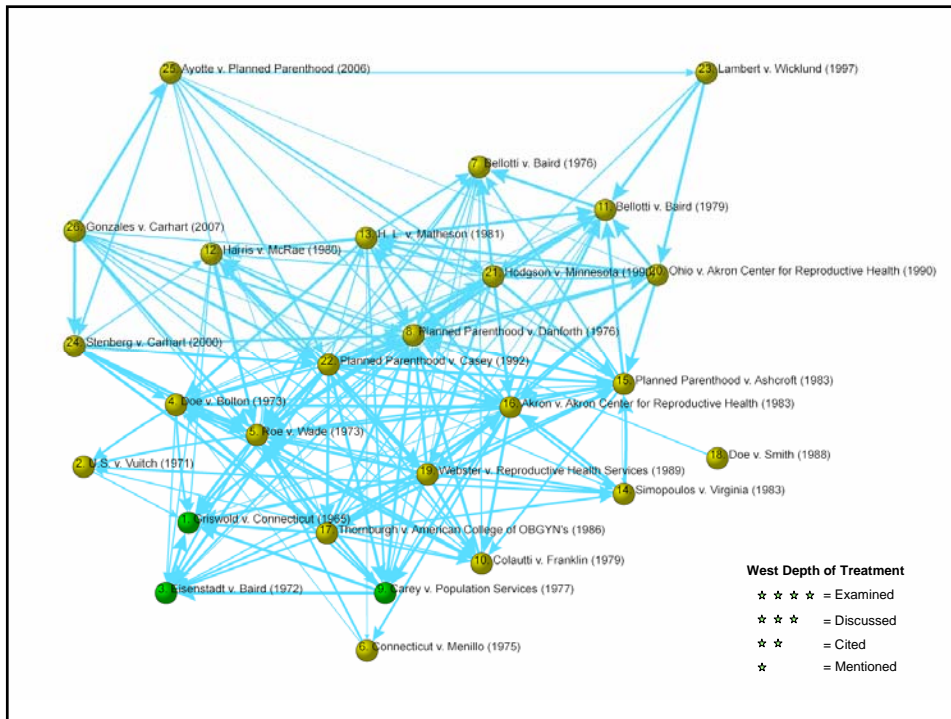
125 Cases Cited in Roe v. Wade

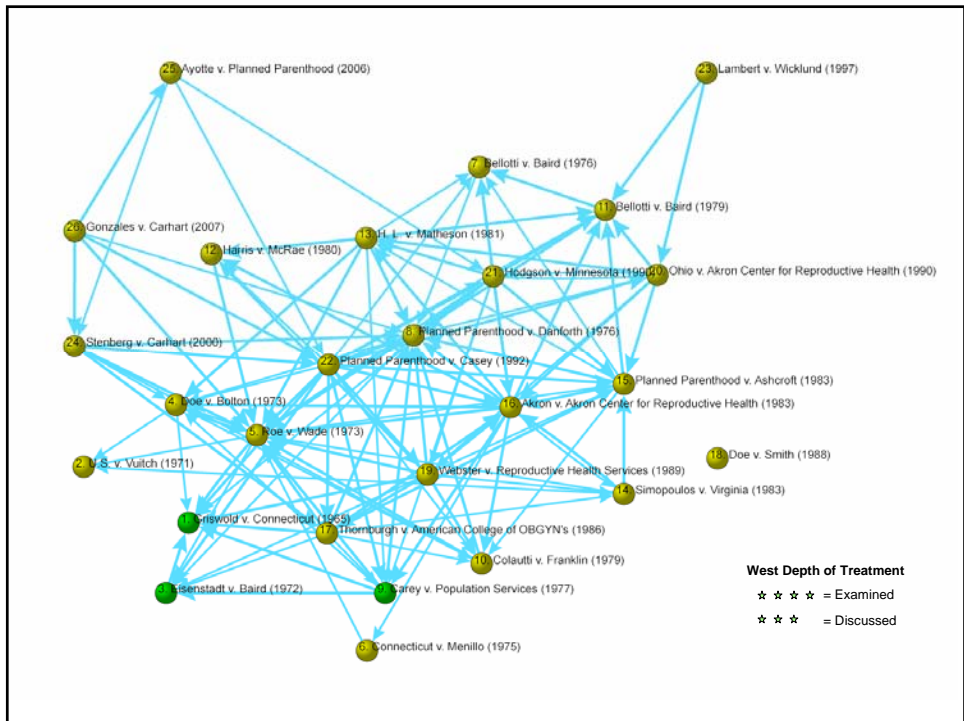
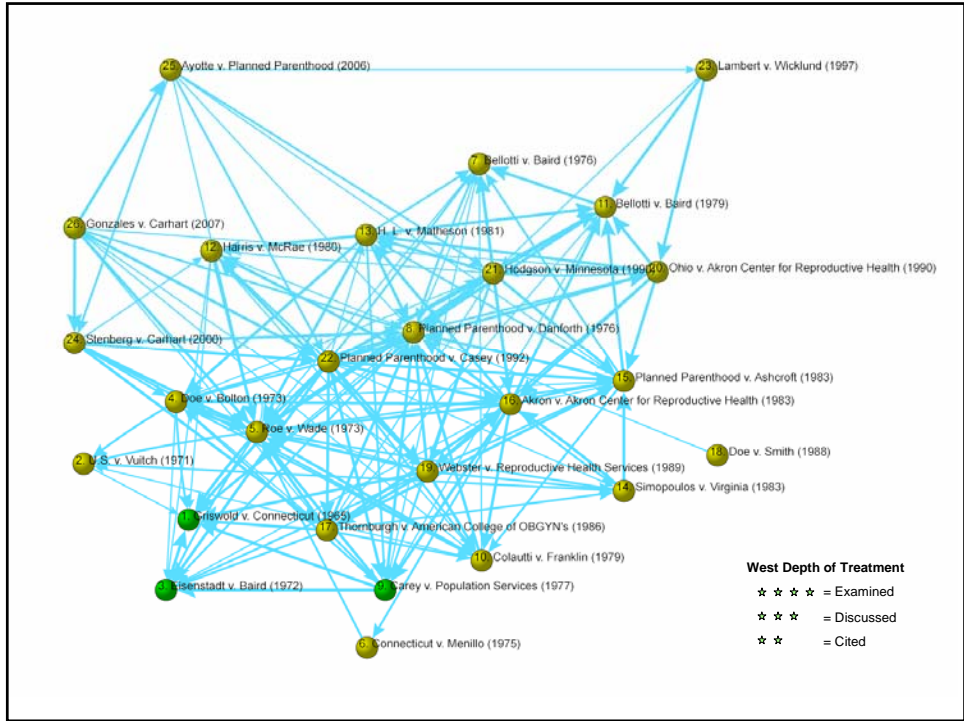
51	Griswold v. Connecticut, 381 U.S. 479 (U.S. Sup. Ct. 1965)	715+
52	U.S. v. Guest, 393 U.S. 598 (U.S. Sup. Ct. 1969)	734
53	Gunn v. University Committee to End War in Viet Nam, 90 S.Ct. 2013 (U.S. Sup. Ct. 1970)	711
54	Hammett v. State, 209 S.W. 661 (Tex. Crim. App. 1919)	726
55	Investment Co. Institute v. Camp, 91 S.Ct. 1091 (U.S. Dist. Col. 1971)	714
56	Jackson v. State, 115 S.W. 262 (Tex. Crim. App. 1908)	710
57	Jacobson v. Commonwealth of Massachusetts, 25	
58	Katz v. U.S., 389 U.S. 375 (U.S. Sup. Ct. 1968)	
59	Keeler v. Superior Court, 470 P.2d 617 (Cal. 1970)	

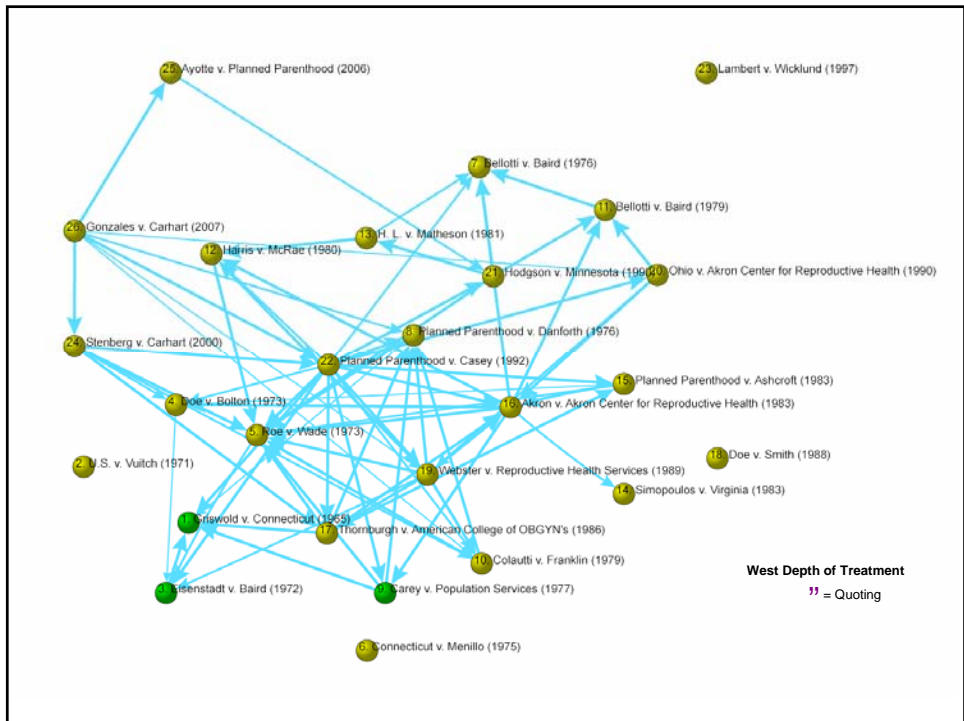
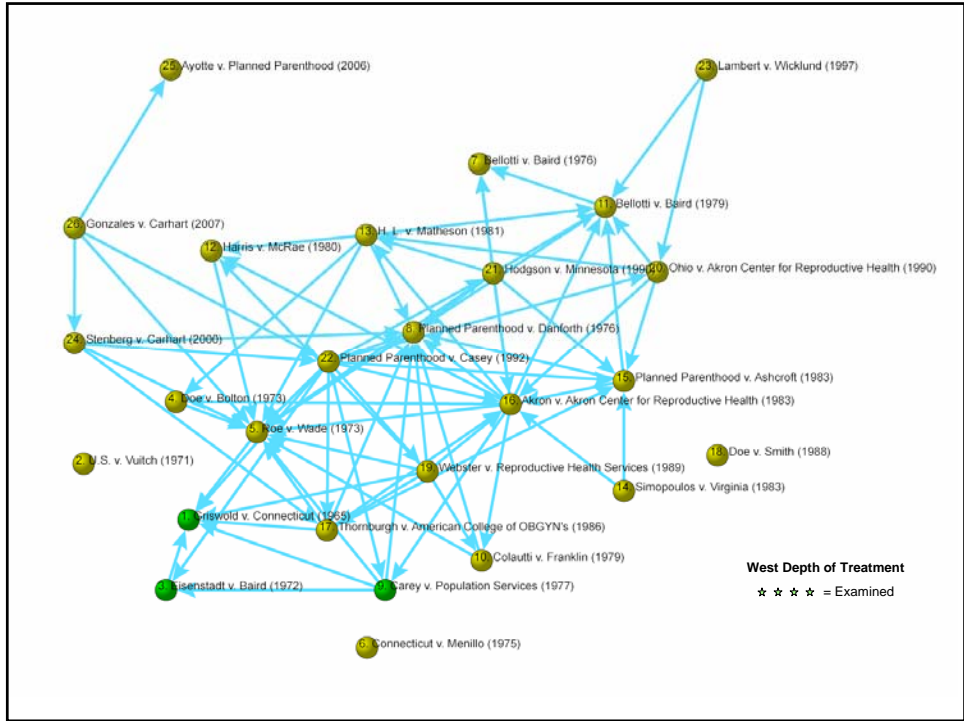
KeyCite Depth of Treatment Stars

KeyCite depth of treatment stars indicate the extent to which a citing case, administrative decision, or brief discusses the cited case.

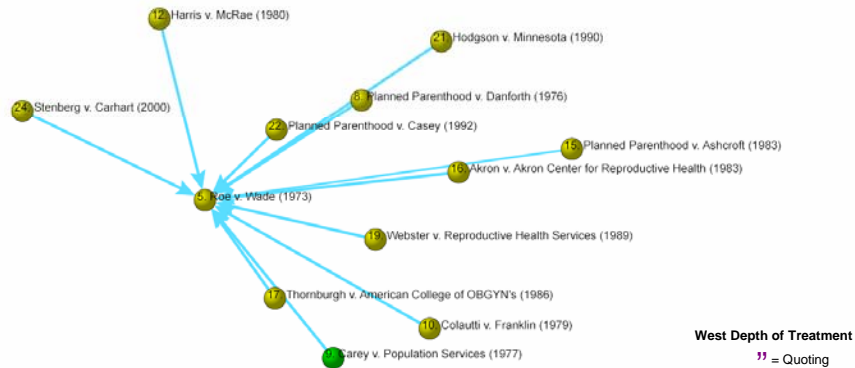
- ★★★★ **Examined** The citing case, administrative decision, or brief contains an extended discussion of the cited case, usually more than a printed page of text.
- ★★★ **Discussed** The citing case, administrative decision, or brief contains a substantial discussion of the cited case, usually more than a paragraph but less than a printed page.
- ★★ **Cited** The citing case, administrative decision, or brief contains some discussion of the cited case, usually less than a paragraph.
- ★ **Mentioned** The citing case, administrative decision, or brief contains a brief reference to the cited case, usually in a string citation.







Opinions that Quote from Roe v. Wade



Relational Infrastructure of the Law (Case Status)

Roe v. Wade
 410 U.S. 113, 93 S.Ct. 705
 U.S. Tex. 1973
 January 22, 1973

125 Cases Cited in Roe v. Wade

- ▶ 51 Griswold v. Connecticut, 85 S.Ct. 1678 (U.S.Conn. 1965) ★★★★★
- ▶ 52 U.S. v. Guest, 86 S.Ct. 1170 (U.S.Ga. 1966) ★★
- ▶ 53 Gunn v. University Committee to End War in Viet Nam, 90 S.Ct. 2013 (U.S.Tex. 1970) ★
- ▶ 54 Hammett v. State, 209 S.W. 661 (Tex.Crim.App. 1919) ★★
- ▶ 55 Investment Co. Institute v. Camp, 91 S.Ct. 1091 (U.S.Dist.Col. 1971) ★★
- ▶ 56 Jackson v. State, 115 S.W. 262 (Tex.Crim.App. 1908) ★★
- ▶ 57 Jacobson v. Commonwealth of Massachusetts, 25 S.Ct. 358 (U.S.Mass. 1905) ★★
- ▶ 58 Katz v. U.S., 88 S.Ct. 507 (U.S.Cal. 1967) ★★
- ▶ 59 Keeler v. Superior Court, 470 P.2d 617 (Cal. 1970) ★

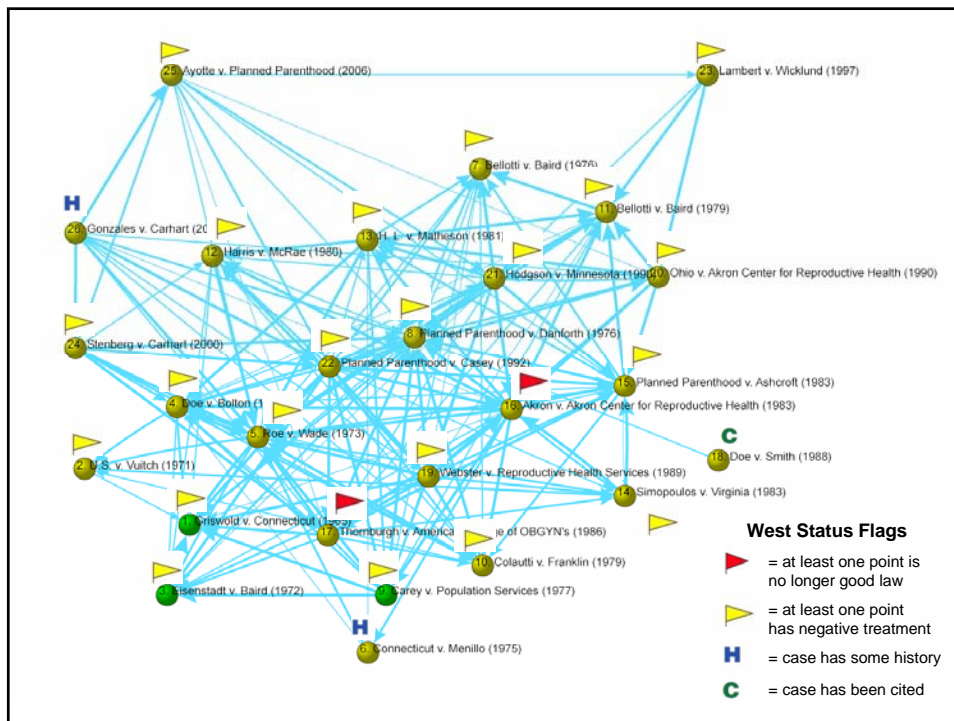
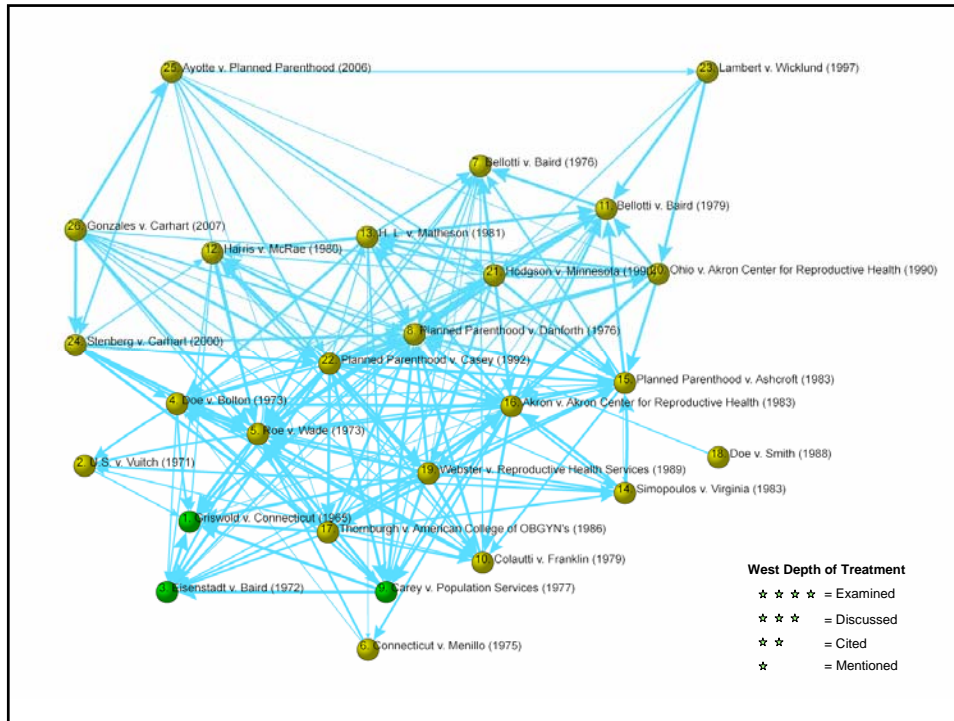
▶ A red flag indicates that a case or administrative decision is no longer good law for at least one of the points of law it contains or that the statute or regulation has been amended by a recent session law or rule, repealed, superseded, or held unconstitutional or preempted in whole or in part.

▶ A yellow flag indicates that a case or administrative decision has some negative history but hasn't been reversed or overruled; the statute has been renumbered or transferred by a recent session law; that an uncodified session law or proposed legislation affecting the statute is available (statutes merely referenced, i.e., mentioned, are not marked with a yellow flag); that the regulation has been reinstated, corrected, or confirmed; that the statute or regulation was limited on constitutional or preemption grounds or its validity was otherwise called into doubt; or that a prior version of the statute or regulation received negative treatment from a court.

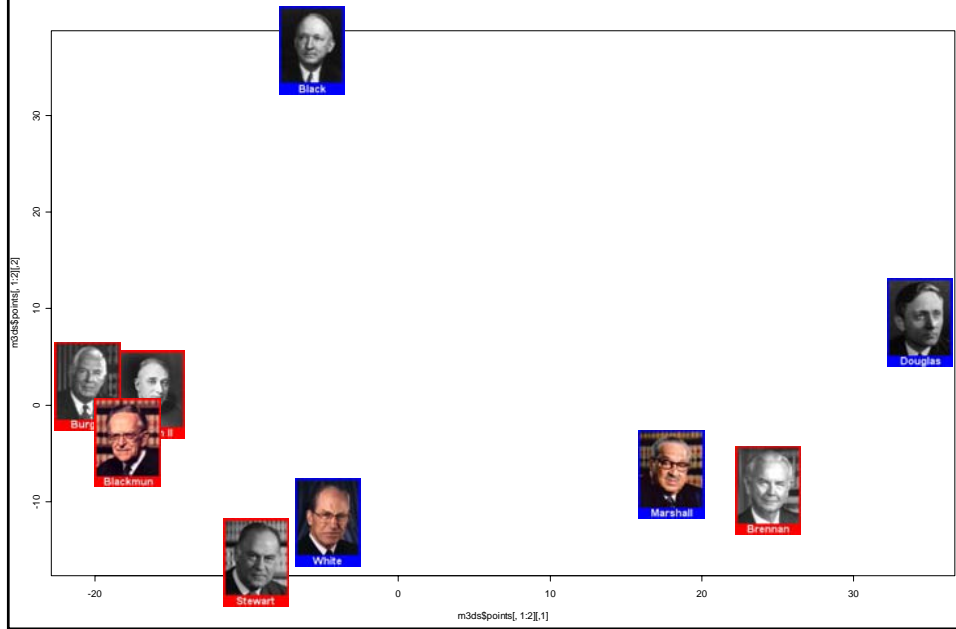
H A blue H indicates that a case or administrative decision has some history.

C A green C indicates that a case or administrative decision has citing references but no direct history or negative citing references or that the statute or regulation has citing references.

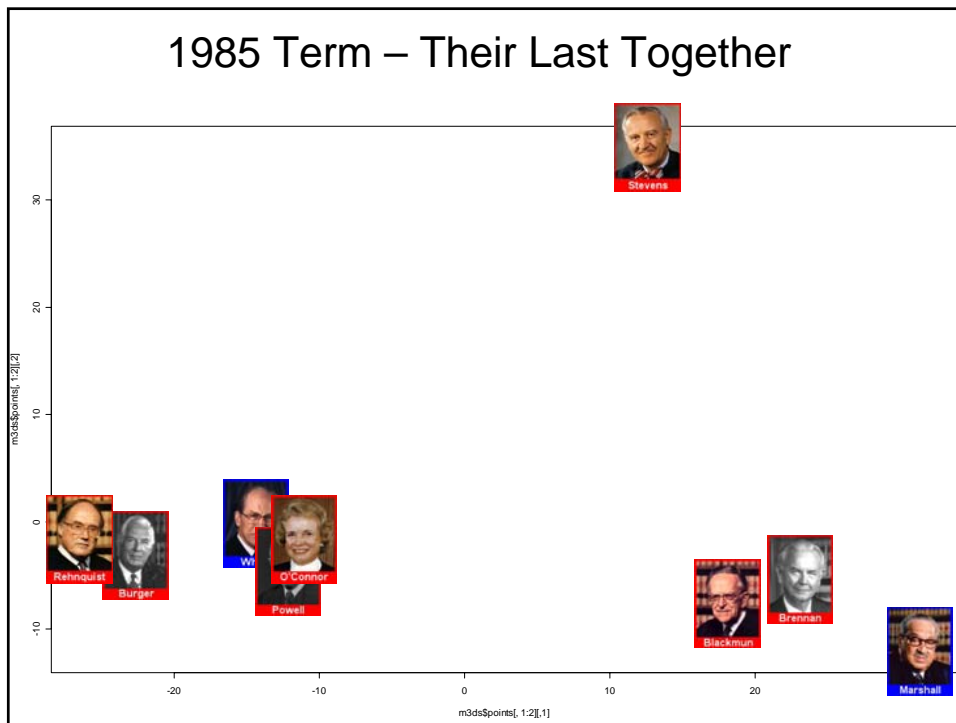
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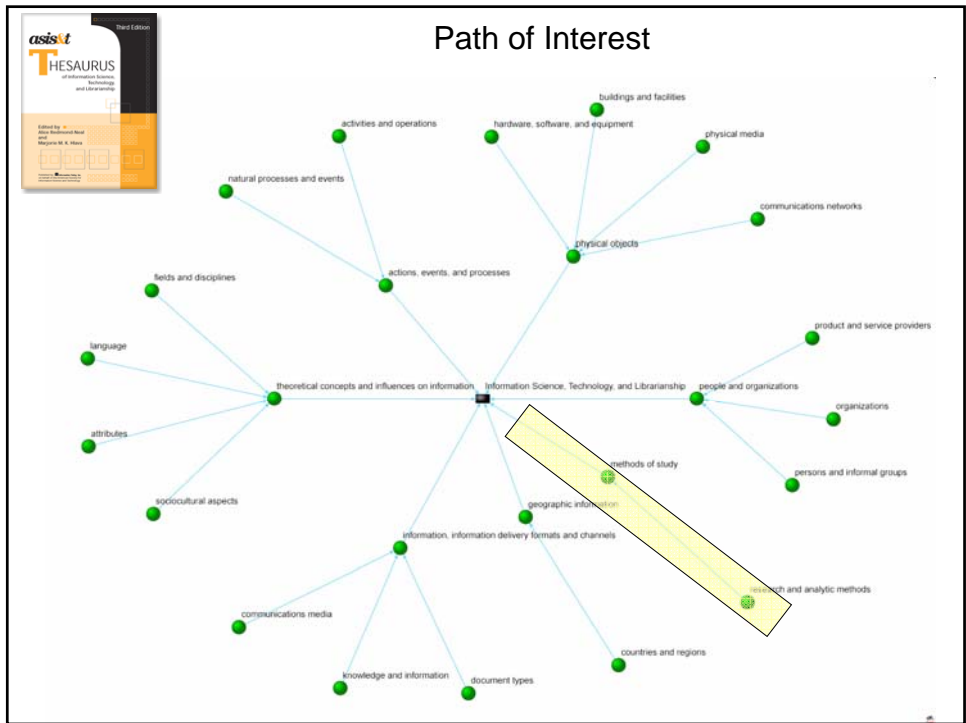
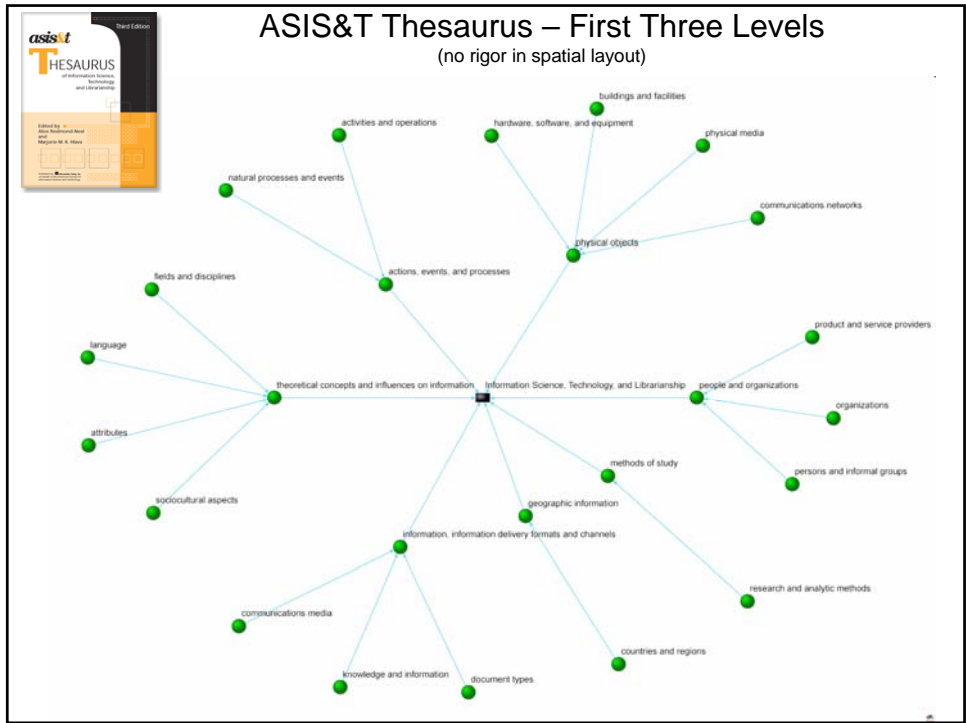


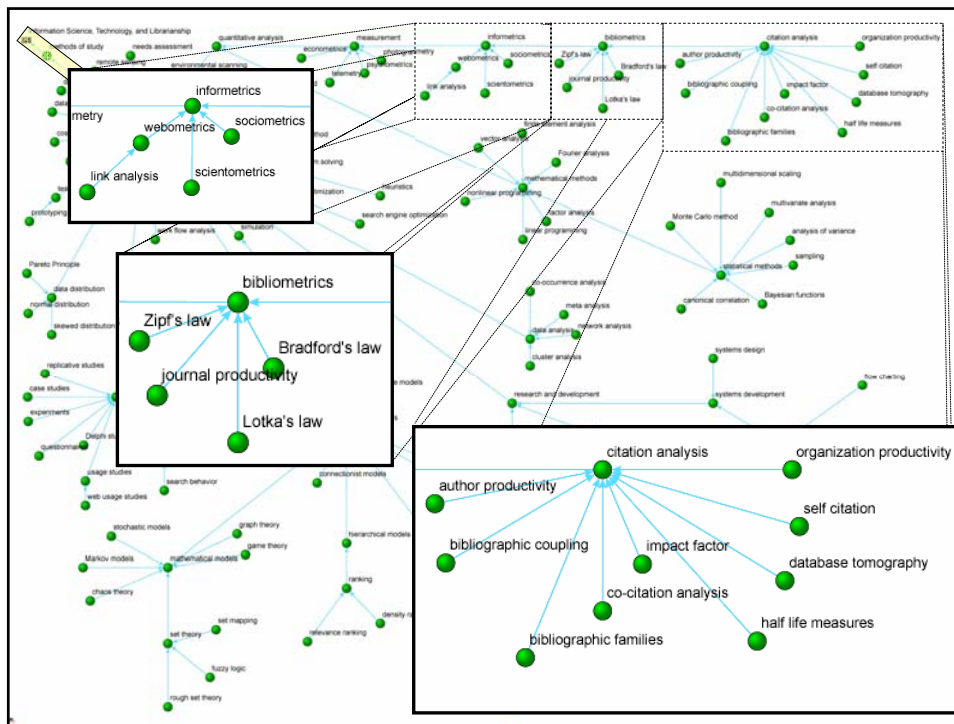
1970 Term – Blackmun / Burger First Together



1985 Term – Their Last Together







Bradford's law is a pattern first described by [Samuel C. Bradford](#) in 1934 that estimates the [exponentially diminishing returns](#) of extending a search for references in [science journals](#). One formulation is that if we sort journals in a field by number of articles into three groups, each with about one-third of all articles, then the number of journals into each group will be proportional to $1:n:n^2$. There are a number of related formulations of the principle.

In economics this pattern is called a [Pareto distribution](#). As a practical example, suppose that a researcher has 5 core [scientific journals](#) for their subject. Suppose that in a month there are 12 articles of interest in those journals. Suppose further that in order to find another dozen articles of interest, the researcher would have to go to 10 journals. Then that researcher's Bradford multiplier bm is 2 (ie 10/5). For each new dozen articles, that researcher will need to look in bm times as many journals. After looking in 5, 10, 20, 40, ... journals, most researchers quickly realize that there is little point in looking further.

Different researchers have different numbers of core journals, and different Bradford multipliers. But the pattern holds quite well across many subjects, and may well be a general pattern for human interactions in social systems. Like [Zipf's law](#), to which it is related, we do not have a good explanation for why it works. But knowing that it does is very useful for librarians. What it means is that for each specialty it is sufficient to identify the "core publications" for that field and only stock those. Very rarely will researchers need to go outside that set.

However its impact has been far greater than that. Armed with this idea and inspired by [Vannevar Bush's](#) famous article [As We May Think](#), [Eugene Garfield](#) at the [Institute for Scientific Information](#) in the [1960s](#) undertook the development of a comprehensive index of how scientific thinking propagates. The creation of his [Science Citation Index \(SCI\)](#) had the effect of making it easy to identify exactly which scientists did science that had an impact, and which journals that science appeared in. It also caused the discovery, which some did not expect, that a few journals like [Nature](#) and [Science](#) were core for all of [hard science](#). The same pattern does not happen with the humanities or the social science - possibly because objective truth is so much harder to establish there, or because literature use in these fields is more diffuse, with less emphasis on journals.

The result of this is pressure on scientists to publish in the best journals, and pressure on universities to ensure access to that core set of journals.

-- Wikipedia (June 21, 2007)

THE END