



The Abdus Salam  
International Centre for Theoretical Physics



SMR.1656 - 23

**School and Workshop on  
Structure and Function of Complex Networks**

**16 - 28 May 2005**

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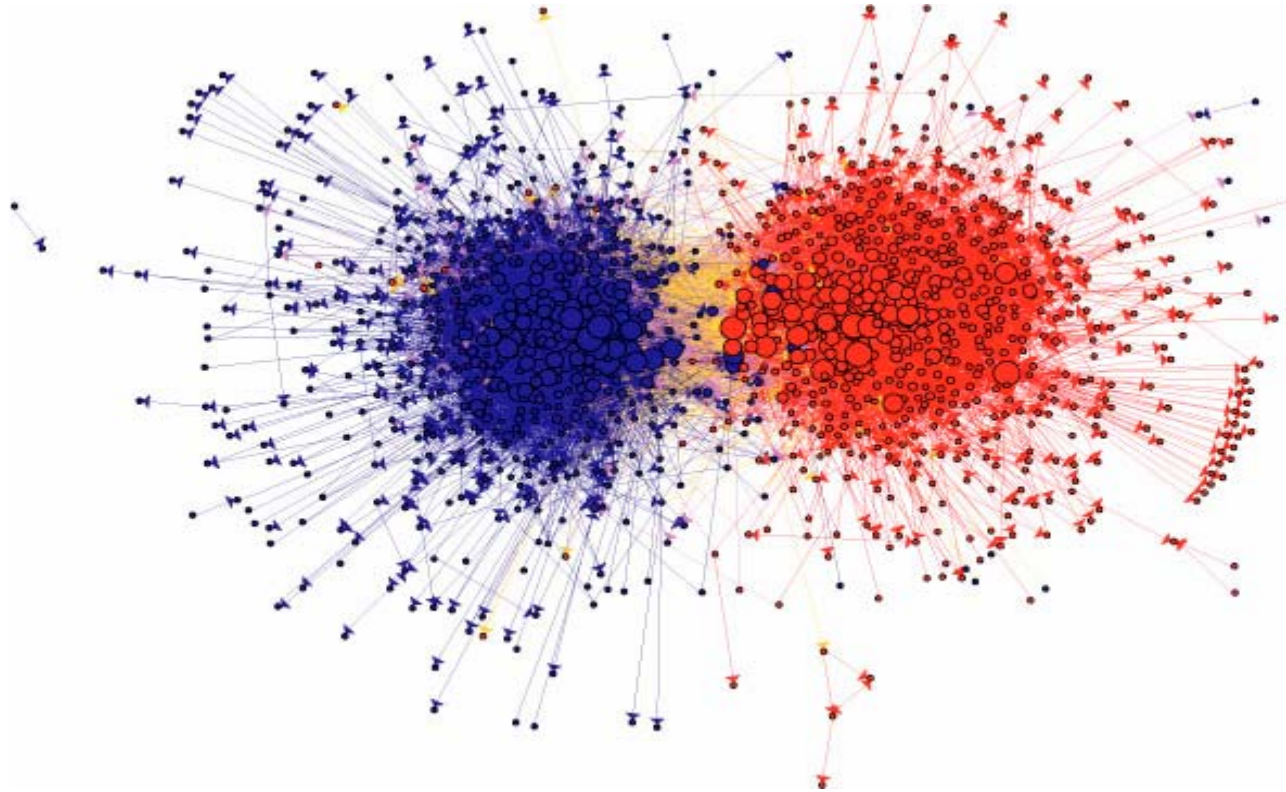
**The Political Blogosphere and the 2004 Election:  
Divided they Blog**

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These are preliminary lecture notes, intended only for distribution to participants

# The political blogosphere and the 2004 election: Divided they blog



**Lada Adamic, HP Labs, Palo Alto, CA**  
**joint work with Natalie Glance @ Intelliseek**

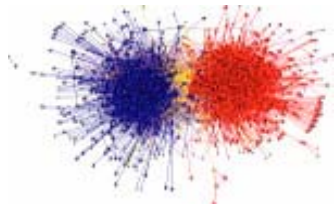
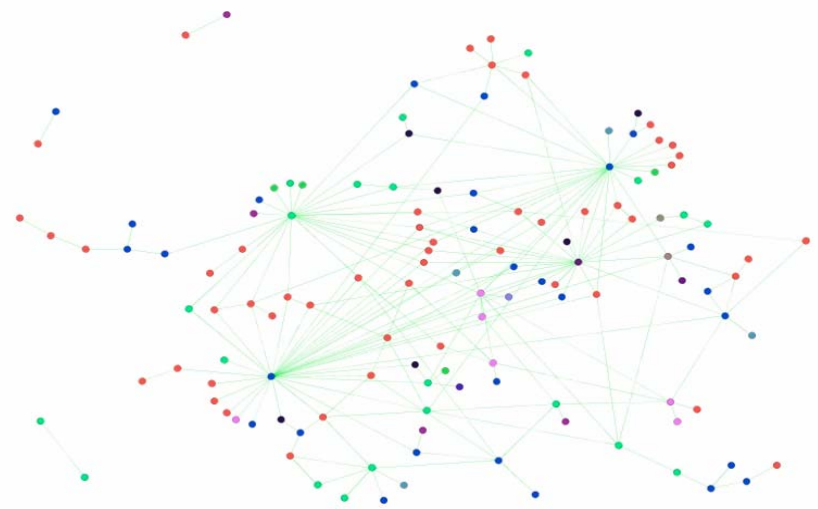


# Talk outline

Why blogs are convenient & interesting to study

Information flow through blogs

Political blogs and the 2004 election



Blogs (web logs) contain online stamped entries


Boing Boing: Cute virii stuffies - Internet Explorer configured for HP Labs

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites Media Print Mail News RSS Feeds

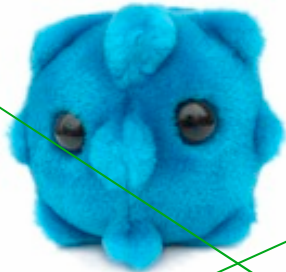
Address [http://boingboing.net/2003/05/14/cute\\_virii\\_stuffies.html](http://boingboing.net/2003/05/14/cute_virii_stuffies.html) Go Links

Google Search Web 521 blocked AutoFill e Options

**boingboing**  **A DIRECTORY OF WONDERFUL THINGS**  
[suggest a site](#) | [home](#) | [archives](#) | [store](#) | [rss](#) | [atom](#) | [mark](#) | [cory](#) | [david](#) | [xeni](#)

Wednesday, May 14, 2003

Cute virii stuffies



Giant Microbes sells stuffed animals that are anthropomorphised microbial bugs. Pictured here, the happy rhinovirus. [Link](#) [Discuss](#) via [Making Light](#)

posted by Cory Doctorow at 02:43:44 PM [permanent link to this entry](#) | [New!](#) [Other](#)  
[blogs commenting on this post](#)

[archives](#)

POWERED BY **MOVABLETYPE** Instant Discussions **QuickTopic** SOME RIGHTS RESERVED **CC creative commons**

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**BEST BLOGS**  
[John Battelle](#)  
[Irregular Orbit](#)  
[Wiley Wiggins](#)  
[Weblogsky](#)  
[Electrolite](#)  
[Making Light](#)  
[Scrubbles.net](#)  
[Mooselessness](#)  
[Follow Me Here](#)  
[Jmwich](#)  
[Kottke.org](#)  
[Elather](#)  
[The Null Device](#)  
[Pigs & Fishes](#)  
[Factovision](#)  
[randomWalks](#)  
[Subterranean Notes](#)  
[Oddball Comic Book of the Day](#)  
[Due Diligence](#)  
[stevenberlinjohnson.com](#)  
[Howard Levy's NanoBot](#)

list of read blogs

date and time stamps

URL that is being commented on

via link

# Blogs: structure and transmission

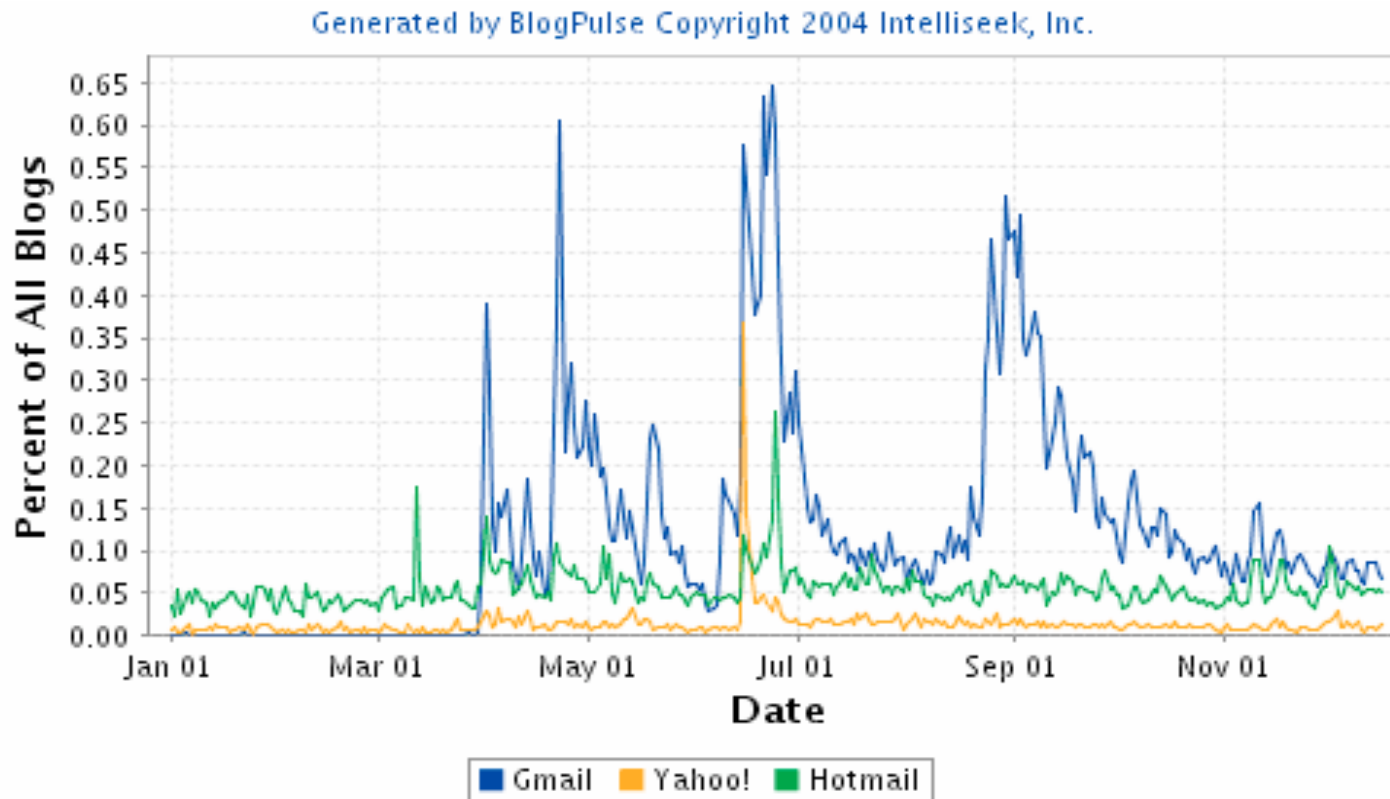
E. Adar, L. Zhang, L. Adamic, & R. Lukose, 2004

- Blog use:
  - Record real-world and virtual experiences
  - Note and discuss things “seen” on the net
- Blog structure: blog-to-blog linking
- Use + Structure
  - Great to track “memes” (catchy ideas)
- Patterns of information flow
  - How does the popularity of a topic evolve over time?
  - Who is getting information from whom?

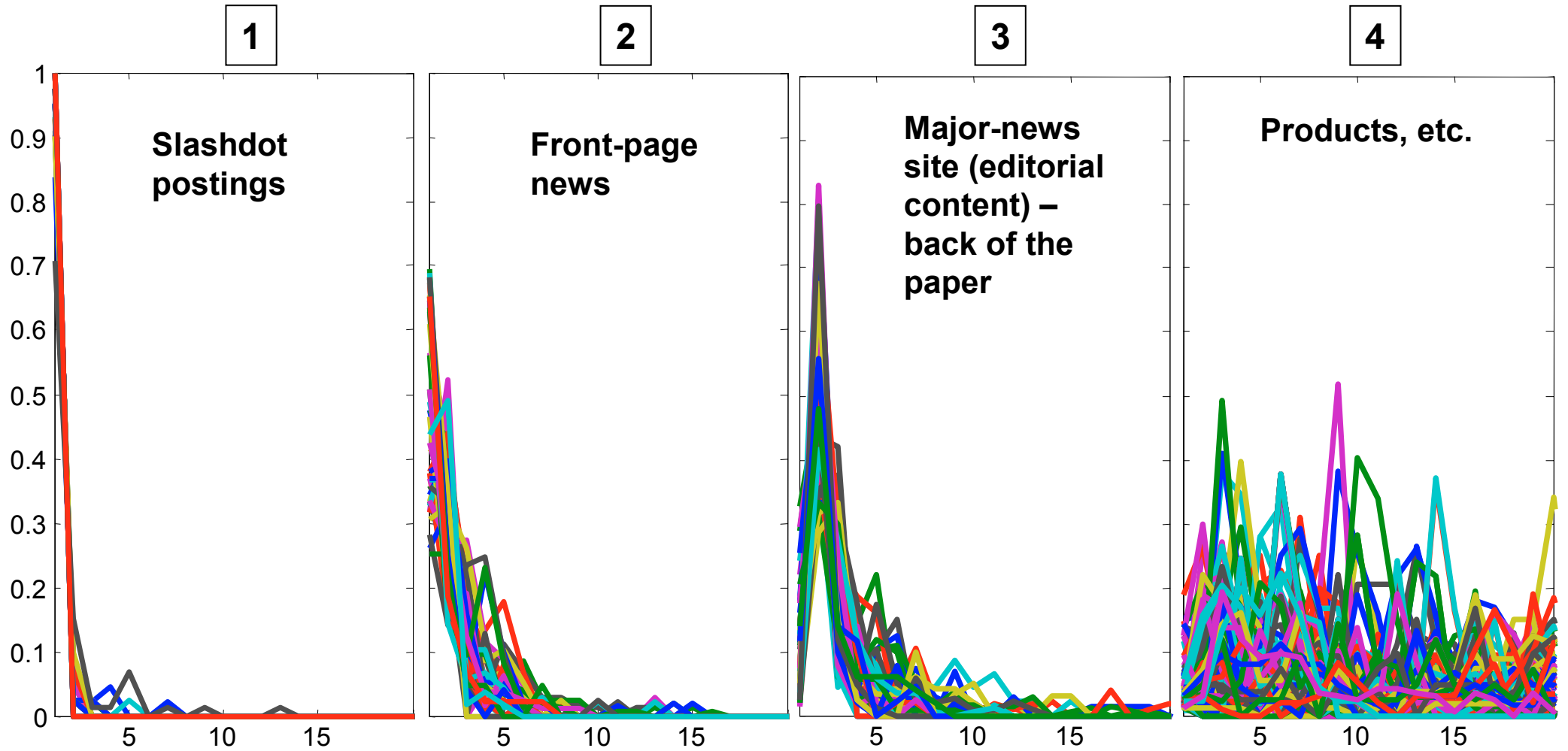


# Intelliseek's BlogPulse

Service for tracking trends in the blogosphere:  
popular URLs, phrases, people



# Different kinds of information have different popularity profiles



# Micro example: Giant Microbes

5.10.2003

Just what our children need: [common diseases made cute](#).  
posted at 11:25 AM by rachel

Embrace illness with [Giant Microbes plush toys](#)! Man, every med student from here to Kalamazoo is going to be inundated with these tchotchkes come Christmas-time. Via [Roninneko](#).  
posted by Reen [link] ...talkety...4 comments

5/13/03

• Cute: [Puppies & kittens](#) (via [Brad Zellar](#)) • Also cute, and yet somewhat disturbing: "[Stuffed animals that look like tiny microbes](#)—only a million times actual size! Now available: The Common Cold, The Flu, Sore Throat, and Stomach Ache." And coming soon: [Martian microbes](#) (via [Reenhead](#)) • [Lou Reed](#) on the cover of Kung

TOYS REMAIN TWI



Comments (2)



"We make stuffed animals that look like tiny microbes—only a million times actual size! Now available: The Common Cold, The Flu, Sore Throat, and Stomach Ache."   
*link via Incoming Signals*

Posted by nchicha at May 14, 2003, 04:50 AM |

medpundit

Commentary on medical news by a practicing physician.

pico search

Search

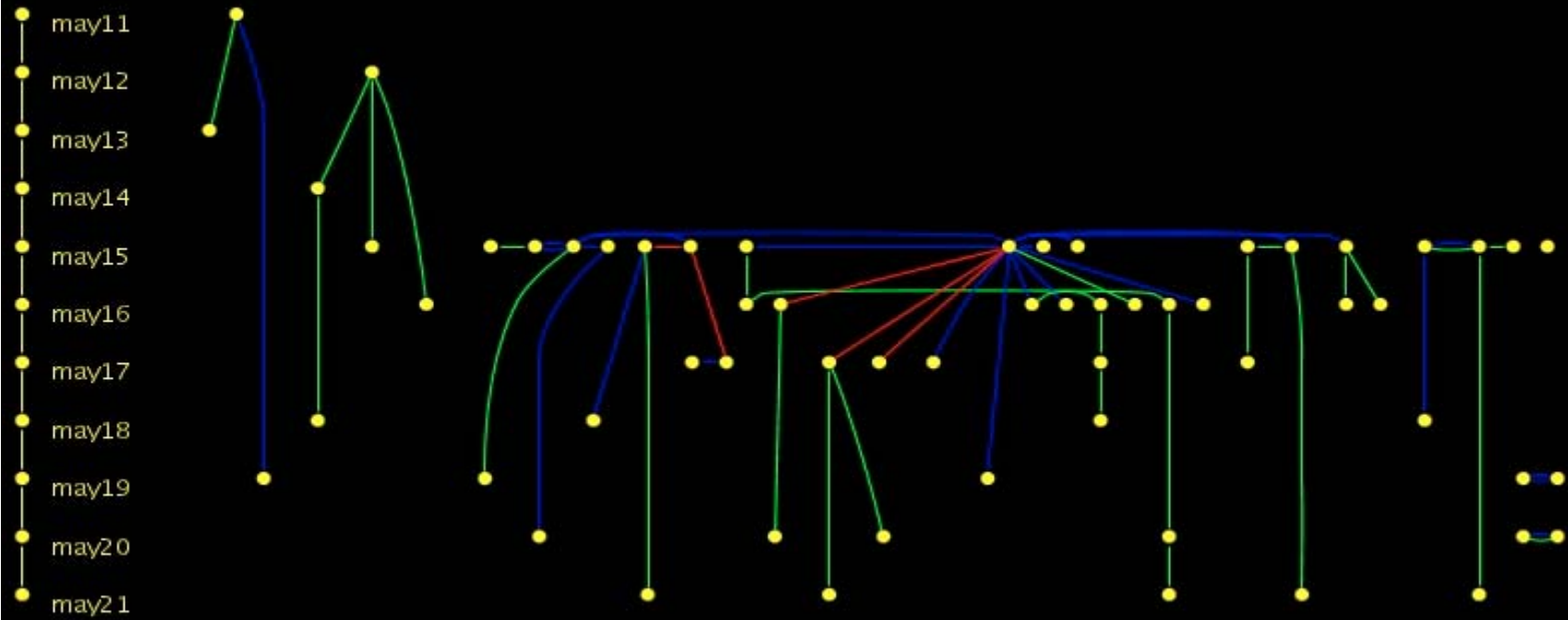
Friday, May 16, 2003

**Plush Bugs:** Looking for the perfect gift for that special someone? Try [GIANTmicrobes!](#) They've got [influenza](#), the [common cold](#), [shigella](#) (which causes diarrhea), and [strep throat](#). (via [Cup of Chicha](#))





# Giant Microbes epidemic visualization



— via link      — explicit link      — inferred link      ● blog



# How do memes evolve?

02:00 AM Friday Mar. 05, 2004 PST [Wired](#) publishes:  
**"Warning: Blogs Can Be Infectious."**



7:25 AM Friday Mar. 05, 2004 PST [Slashdot](#) posts:  
**"Bloggers' Plagiarism Scientifically Proven"**



9:55 AM Friday Mar. 05, 2004 PST [Metafilter](#) announces  
**"A good amount of bloggers are outright thieves."**



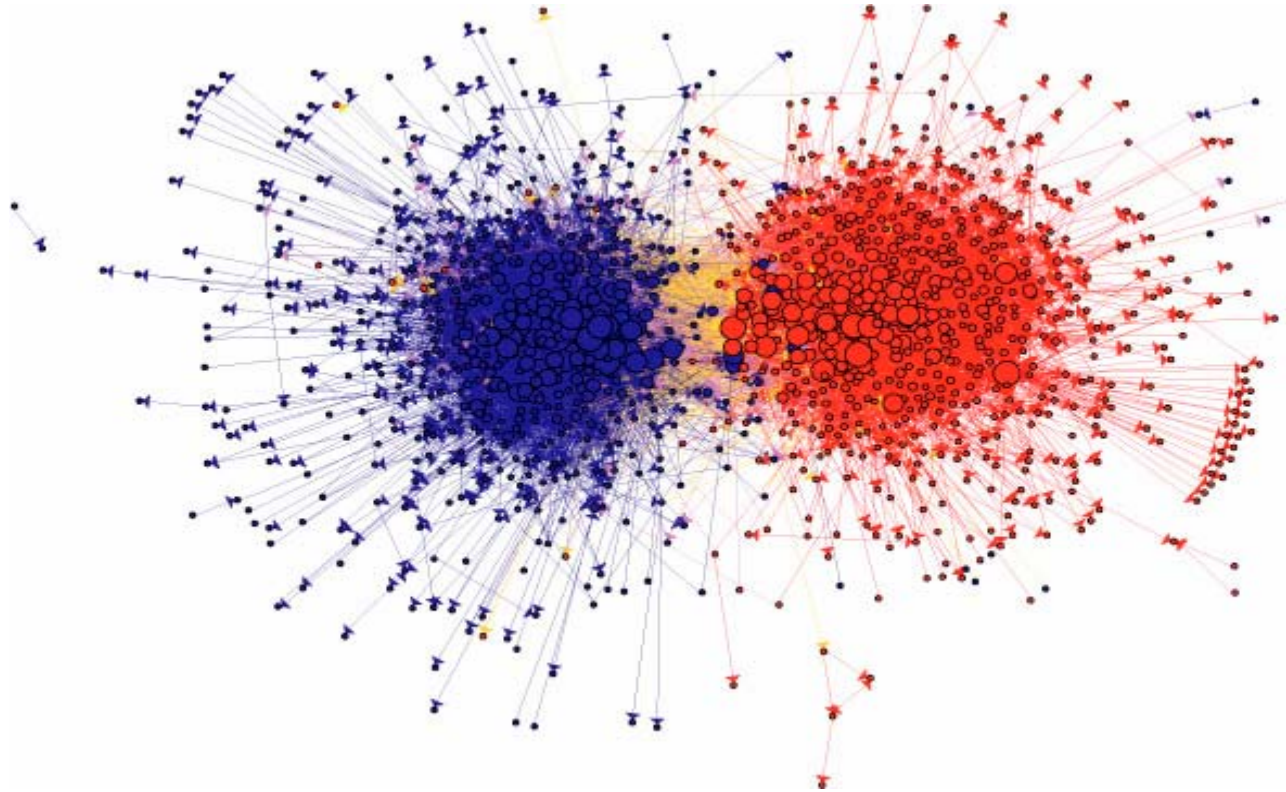
Before lunch: Eytan writes  
**FAQ: Do bloggers kill kittens?**



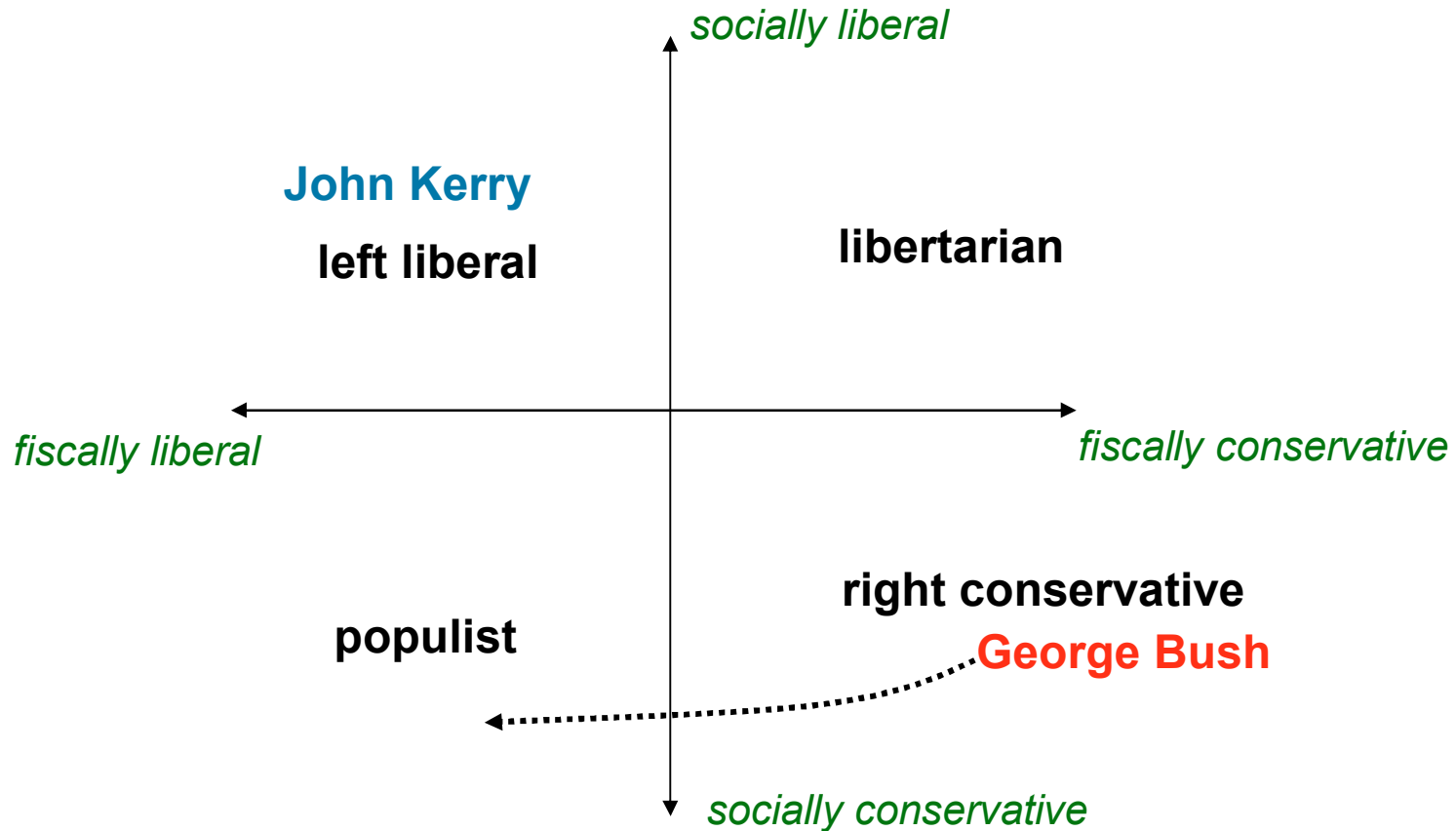
After lunch: Several bloggers title posts **'Bloggers kill kittens!'**



What can we learn from observing political blogs?



# political positions in US politics



voting mechanics favor a two-party system: democrats & republicans



# Political blogs gaining in importance

- Pew Internet & American Life Project Report, January 2005, reports:
  - 63 million U.S. citizens use the Internet to stay informed about politics (mid-2004, Pew Internet Study)
  - 9% of Internet users read political blogs preceding the 2004 U.S. Presidential Election
- 2004 Presidential Campaign Firsts
  - Candidate blogs: e.g. Dean's [blogforamerica.com](http://blogforamerica.com)
  - Successful grassroots campaign conducted via websites & blogs
  - Bloggers credentialed as journalists & invited to nominating conventions



## Related research on political blogs

- 10 most popular political blogs account for half the blogs read by surveyed journalists (Drezner and Farrell 2004)
- The most popular blogs also receive the majority of citation links (Shirky 2003).
- Citation link structure reveals topical subcommunities: Catholicism, homeschooling, A-list bloggers (Herring et. al. 2005)
- Comparison of network neighborhoods of Atrios and Instapundit: no overlap in linking behavior (Welsch 2005)
- Research question: Are we witnessing a cyberbalkanization of the Internet?

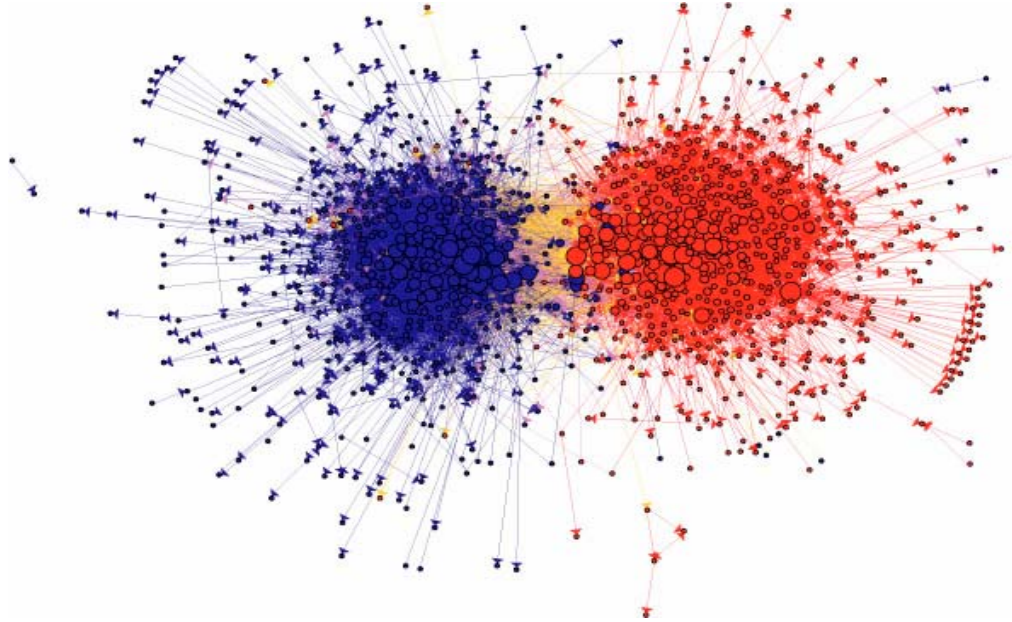


# Calling all political blogs

- Collected self-identified liberal and conservative blogs from online directories (eTalkingHead, BlogCatalog, CampaignLine, Blogorama)
- Crawled home page of each blog in February 2005: found 30 more well-cited political blogs (manually categorized)
  - biases toward sidebar/blogroll links
- Did not include libertarian, independent or moderate blogs (fewer in number and lesser in popularity)
- Identified: 676 liberal and 659 conservative blogs



# The larger political blogosphere

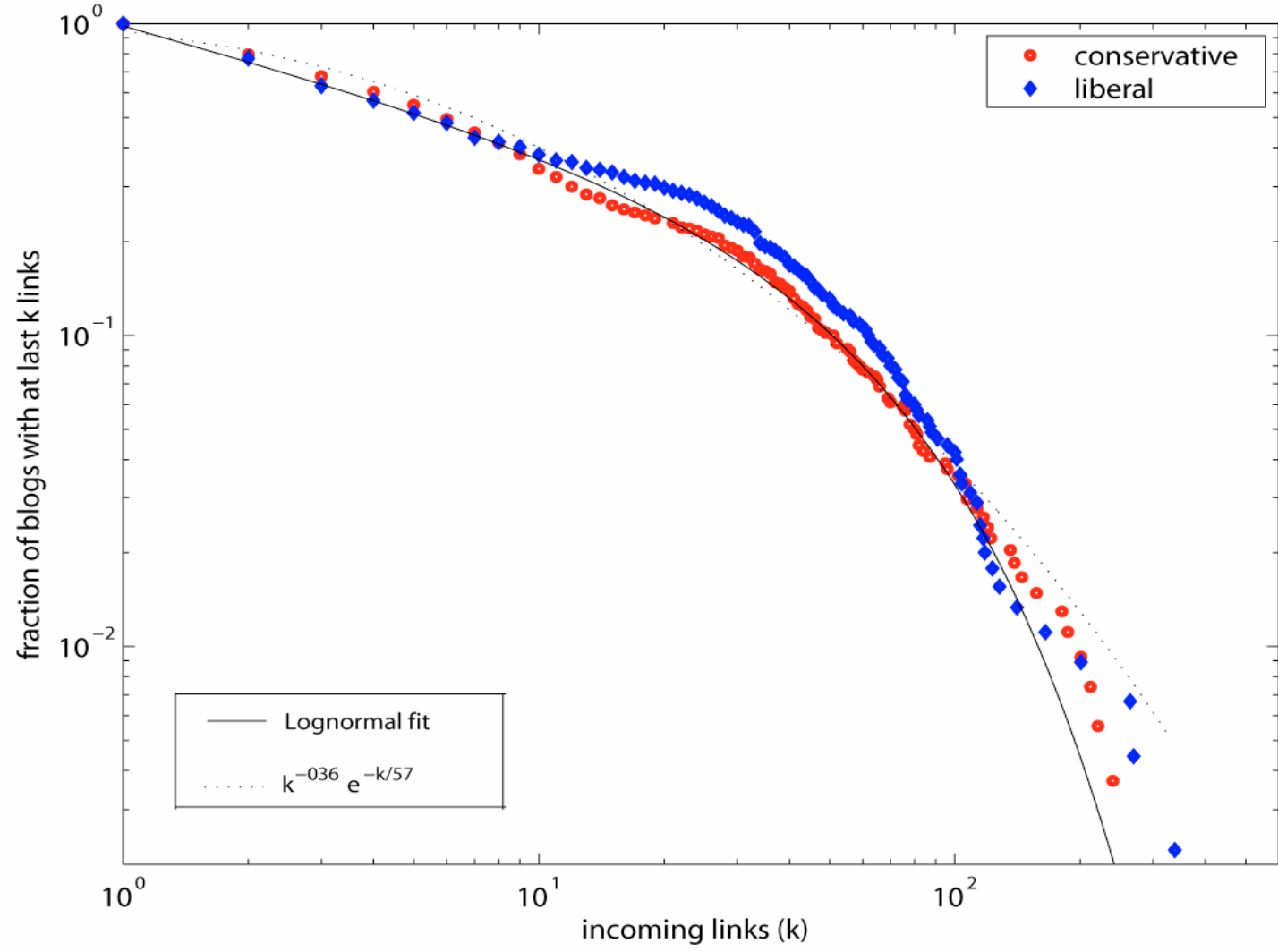


## Results

- 91% of links point to blog of same persuasion
- Conservative blogs show greater tendency to link
  - 82% of conservative blogs linked to at least once; 84% link to at least one other blog
  - 67% of liberal blogs are linked to at least once; 74% link to at least one other blog
- Average # of links per blog is similar: 13.6 for liberal; 15.1 for conservative
- Higher proportion of liberal blogs that are not linked to at all



# Indegree distributions for political blogs



## Different rankings produce similar A-lists

	Technorati	SiteMeter	TheTruthLaidBear	BlogPulse
1	Instapundit	Daily Kos	Instapundit	Daily Kos
2	Daily Kos	Instapundit	Daily Kos	Power Line
3	Eschaton	Eschaton	Power Line	Instapundit
4	Little Green Footballs	Little Green Footballs	Little Green Footballs	Talking Points Memo
5	Andrew Sullivan	Power Line	Michelle Malkin	Eschaton
6	Wonkette	Wonkette	Talking Points Memo	Little Green Footballs
7	Power Line	Smirking Chimp	Eschaton	Washington Monthly
8	Volokh Conspiracy	Michelle Malkin	Captain's Quarters	Hugh Hewitt
9	Michelle Malkin	Blog for America	Volokh Conspiracy	Andrew Sullivan
10	Lileks	Lileks	Wizbang	Captain's Quarters



## Top 20 liberal blogs

overall rank	# post citations	# posts	liberal weblog	# links L-blogs	# links R-blogs
1	10053	1114	<a href="http://dailykos.com">dailykos.com</a>	292	46
6	6452	580	<a href="http://www.talkingpointsmemo.com">www.talkingpointsmemo.com</a>	242	22
7	5468	945	<a href="http://atrios.blogspot.com">atrios.blogspot.com</a>	230	39
9	4830	502	<a href="http://www.washingtonmonthly.com">www.washingtonmonthly.com</a>	165	36
18	2764	409	<a href="http://www.wonkette.com">www.wonkette.com</a>	83	30
24	2277	211	<a href="http://www.juancole.com">www.juancole.com</a>	149	16
30	1675	550	<a href="http://yglesias.typepad.com/matthew">yglesias.typepad.com/matthew</a>	104	24
33	1621	429	<a href="http://www.crookedtimber.org">www.crookedtimber.org</a>	81	19
41	1365	348	<a href="http://www.mydd.com">www.mydd.com</a>	107	8
45	1289	512	<a href="http://www.oliverwillis.com">www.oliverwillis.com</a>	97	20
48	1268	767	<a href="http://blog.johnkerry.com">blog.johnkerry.com</a>	21	2
49	1257	607	<a href="http://www.pandagon.net">www.pandagon.net</a>	118	5
54	1191	949	<a href="http://www.talkleft.com">www.talkleft.com</a>	126	15
55	1142	345	<a href="http://digbysblog.blogspot.com">digbysblog.blogspot.com</a>	115	3
56	1141	722	<a href="http://www.politicalwire.com">www.politicalwire.com</a>	87	16
59	1077	470	<a href="http://www.j-bradford-delong.net/movable_type">www.j-bradford-delong.net/movable_type</a>	98	11
66	1002	722	<a href="http://www.prospect.org/weblog">www.prospect.org/weblog</a>	102	11
68	991	1653	<a href="http://americablog.blogspot.com">americablog.blogspot.com</a>	64	5
74	947	582	<a href="http://www.theleftcoaster.com">www.theleftcoaster.com</a>	78	4
77	851	115	<a href="http://www.jameswolcott.com">www.jameswolcott.com</a>	74	6



## Top 20 conservative blogs

overall rank	# post citations	# posts	conservative weblog	# links L-blogs	# links R-blogs
2	8438	924	<a href="http://www.powerlineblog.com">www.powerlineblog.com</a>	26	195
3	7813	740	<a href="http://instapundit.com">instapundit.com</a>	43	234
8	5298	682	<a href="http://www.littlegreenfootballs.com/weblog">www.littlegreenfootballs.com/weblog</a>	10	171
11	3297	66	<a href="http://www.hughhewitt.com">www.hughhewitt.com</a>	11	146
12	3226	494	<a href="http://www.andrewsullivan.com/index.php">www.andrewsullivan.com/index.php</a>	59	86
13	3220	701	<a href="http://www.captainsquartersblog.com/mt">www.captainsquartersblog.com/mt</a>	5	117
14	3186	801	<a href="http://www.wizbangblog.com">www.wizbangblog.com</a>	14	125
16	2781	398	<a href="http://www.indcjournal.com">www.indcjournal.com</a>	6	60
17	2773	341	<a href="http://www.michellemalkin.com">www.michellemalkin.com</a>	10	191
19	2596	1027	<a href="http://blogsforbush.com">blogsforbush.com</a>	4	208
25	2259	87	<a href="http://www.allahpundit.com">www.allahpundit.com</a>	2	37
26	2156	100	<a href="http://belmontclub.blogspot.com">belmontclub.blogspot.com</a>	3	93
27	1944	50	<a href="http://realclearpolitics.com">realclearpolitics.com</a>	13	104
28	1882	633	<a href="http://volokh.com">volokh.com</a>	27	80
35	1570	510	<a href="http://timblair.spleenville.com">timblair.spleenville.com</a>	7	80
37	1523	428	<a href="http://windsofchange.net">windsofchange.net</a>	16	65
38	1512	595	<a href="http://www.vodkapundit.com">www.vodkapundit.com</a>	9	97
40	1468	446	<a href="http://www.rogerlsimon.com">www.rogerlsimon.com</a>	6	74
42	1364	899	<a href="http://www.deanesmay.com">www.deanesmay.com</a>	8	79
44	1310	580	<a href="http://mypetjawa.mu.nu">mypetjawa.mu.nu</a>	0	51



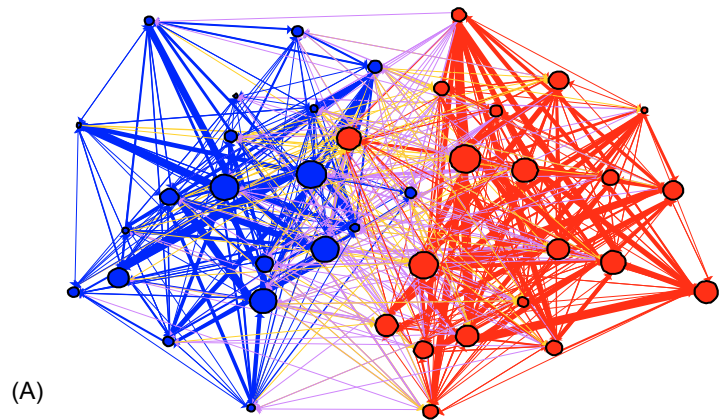
# Methodology for detailed study of A-list blogs

- Harvested posts for top 20 lists from BlogPulse
  - BlogPulse stores individual posts: date, permalink, and content
  - Date range: late August 2004 → mid-November 2004
  - Collected: 12,470 liberal posts; 10,414 conservative posts
- Identifying citation links (weblog post → blog OR post)
  - For each post, extract all links (hrefs)
  - Exclude self-links
  - Blogroll/sidebar links not included
  - 1511 L-L citations; 2110 R-R citations; 247 L-R; 312 R-L
- Result: Conservatives had 16% fewer posts but cited each other 40% more often



# Citations between blogs in their posts

(Aug 29<sup>th</sup> – Nov 15<sup>th</sup>, 2004)



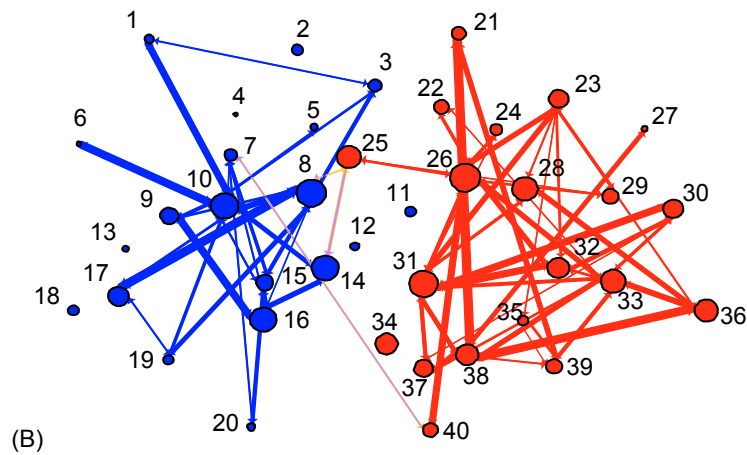
(A)

- 1 Digbys Blog
- 2 JamesWalcott
- 3 Pandagon
- 4 blog.johnkerry.com
- 5 Oliver Willis
- 6 America Blog
- 7 Crooked Timber
- 8 Daily Kos
- 9 American Prospect
- 10 Eschaton
- 11 Wonkette
- 12 Talk Left
- 13 Political Wire
- 14 Talking Points Memo
- 15 Matthew Yglesias
- 16 Washington Monthly
- 17 MyDD
- 18 Juan Cole
- 19 Left Coaster
- 20 Bradford DeLong

A) all citations between A-list blogs in 2 months preceding the 2004 election

B) citations between A-list blogs with at least 5 citations in both directions

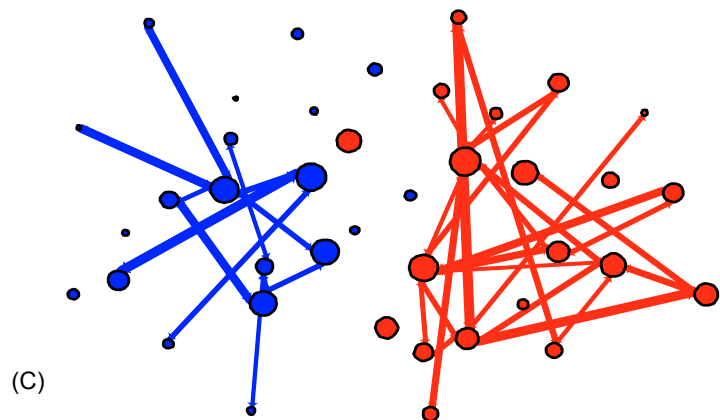
C) edges further limited to those exceeding 25 combined citations



(B)

- 21 JawaReport
- 22 Voka Pundit
- 23 Roger L Simon
- 24 Tim Blair
- 25 Andrew Sullivan
- 26 Instapundit
- 27 Blogs for Bush
- 28 Little Green Footballs
- 29 Belmont Club
- 30 Captain's Quarters
- 31 Powerline
- 32 Hugh Hewitt
- 33 INDCJournal
- 34 Real Clear Politics
- 35 Winds of Change
- 36 Allahpundit
- 37 Michelle Malkin
- 38 WizBang
- 39 Dean's World
- 40 Volokh

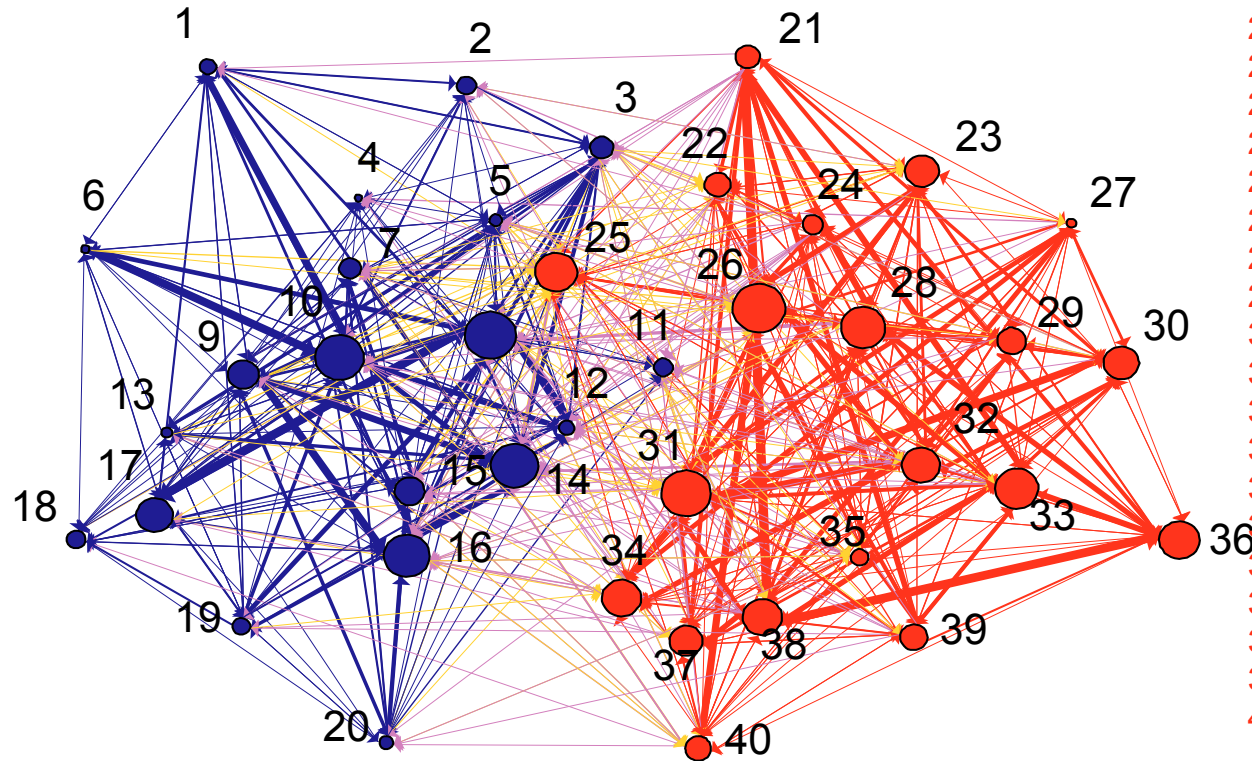
*only 15% of the citations bridge communities*



(C)



- 1 Digby's Blog
- 2 James Walcott
- 3 Pandagon
- 4 blog.johnkerry.com
- 5 Oliver Willis
- 6 America Blog
- 7 Crooked Timber
- 8 Daily Kos
- 9 American Prospect
- 10 Eschaton
- 11 Wonkette
- 12 Talk Left
- 13 Political Wire
- 14 Talking Points Memo
- 15 Matthew Yglesias
- 16 Washington Monthly
- 17 MyDD
- 18 Juan Cole
- 19 Left Coaster
- 20 Bradford DeLong



- 21 JawaReport
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- 25 Andrew Sullivan
- 26 Instapundit
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- 29 Belmont Club
- 30 Captain's Quarters
- 31 Powerline
- 32 Hugh Hewitt
- 33 INDC journal
- 34 Real Clear Politics
- 35 Winds of Change
- 36 Allahpundit
- 37 Michelle Malkin
- 38 Wizbang
- 39 Dean's World
- 40 Volokh



# Notable examples of blogs breaking a story

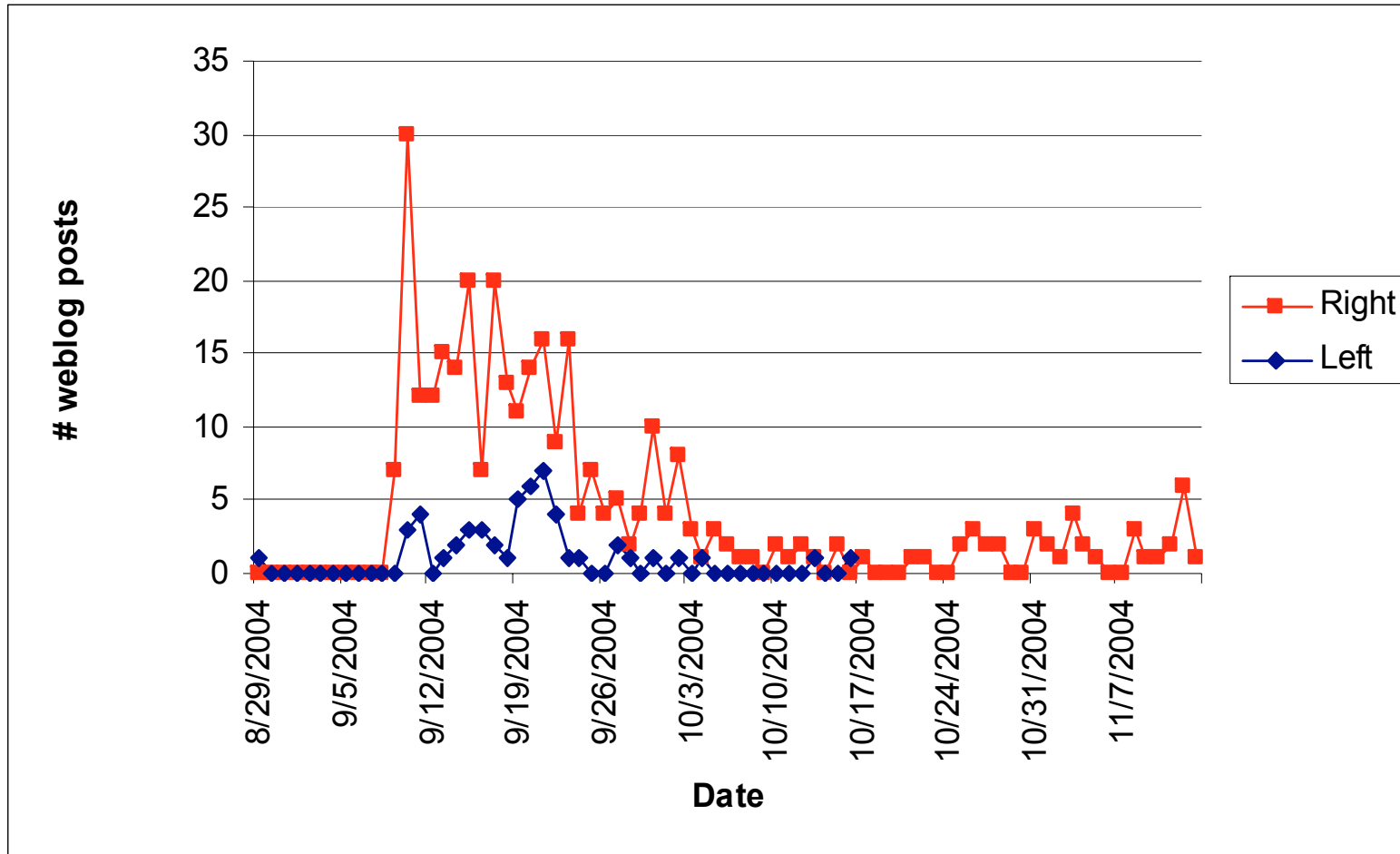
1. Swiftvets.com anti-Kerry video
  - Bloggers linked to this in late July, keeping accusations alive
  - Kerry responded in late August, bringing mainstream media coverage
2. CBS memos alleging preferential treatment of Pres. Bush during the Vietnam War
  - Powerline broke the story on Sep. 9<sup>th</sup>, launching flurry of discussion
  - Dan Rather apologized later in the month
3. “Was Bush Wired?”
  - Salon.com asked the question first on Oct. 8<sup>th</sup>, echoed by Wonkette & PoliticalWire.com
  - MSM follows-up the next day





# Liberals and conservatives differ in the topics they discuss

## Discussion of “forged documents”



## Political blogs as echo chambers

Pairwise comparison of URLs and phrases posted by each blog

$$V_A = W_{U1} \ W_{U2} \ \dots \ W_{UN}$$

tf\*idf weight~ (number of times blog mentions URL)\*  
 $\log[(\text{total number of blogs monitored by blogpulse})/(\text{number of those blogs citing the URL})]$

Similarity of two blogs is given by the cosine of their vectors

$$\cos(A,B) = v_A \cdot v_B / (\|v_A\| * \|v_B\|)$$

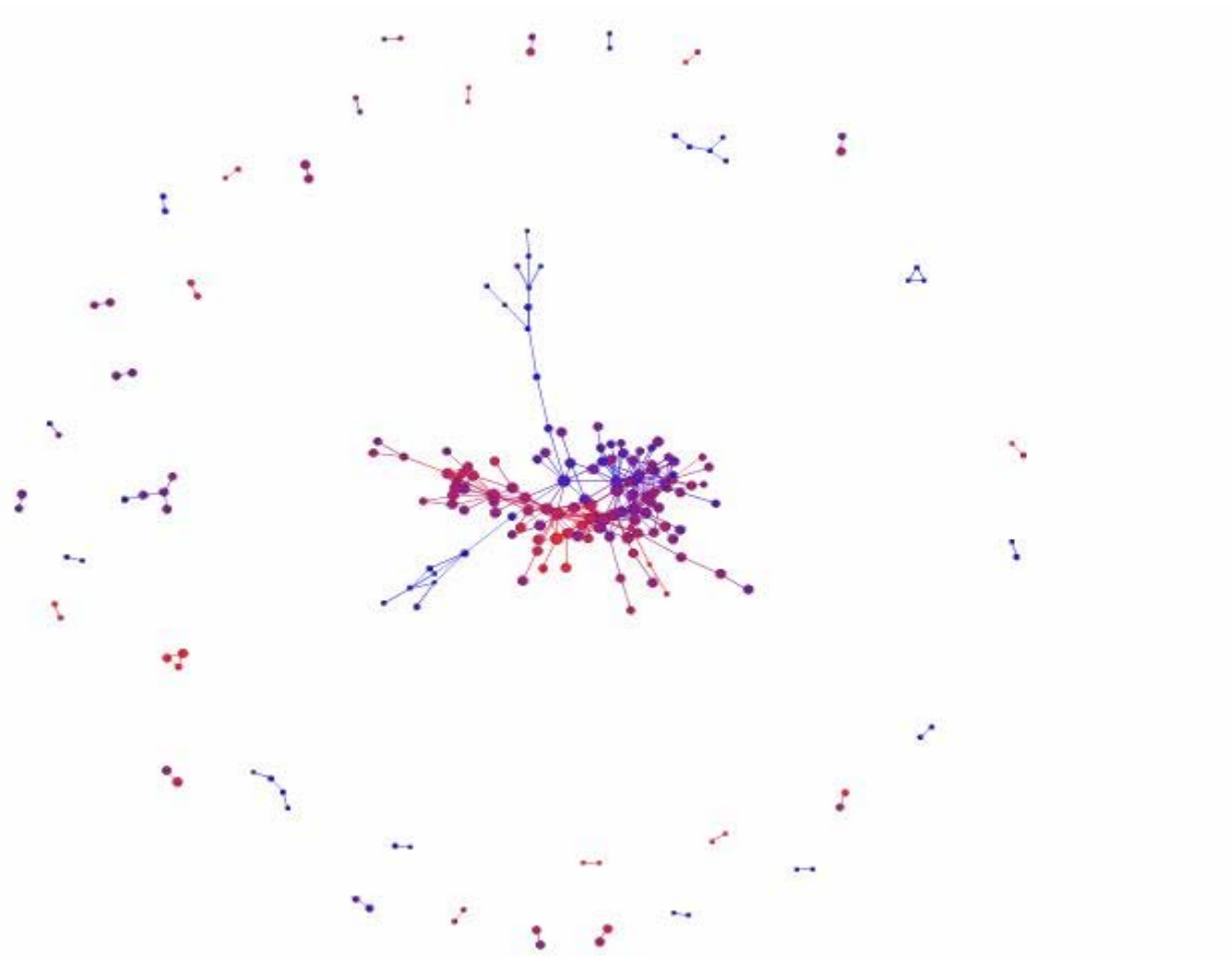
Similarity in URLs between blogs of the same persuasion was higher (0.08 for liberal blogs and 0.09 for conservative ones), than between mixed pairs (0.03)

Same trend for phrases.

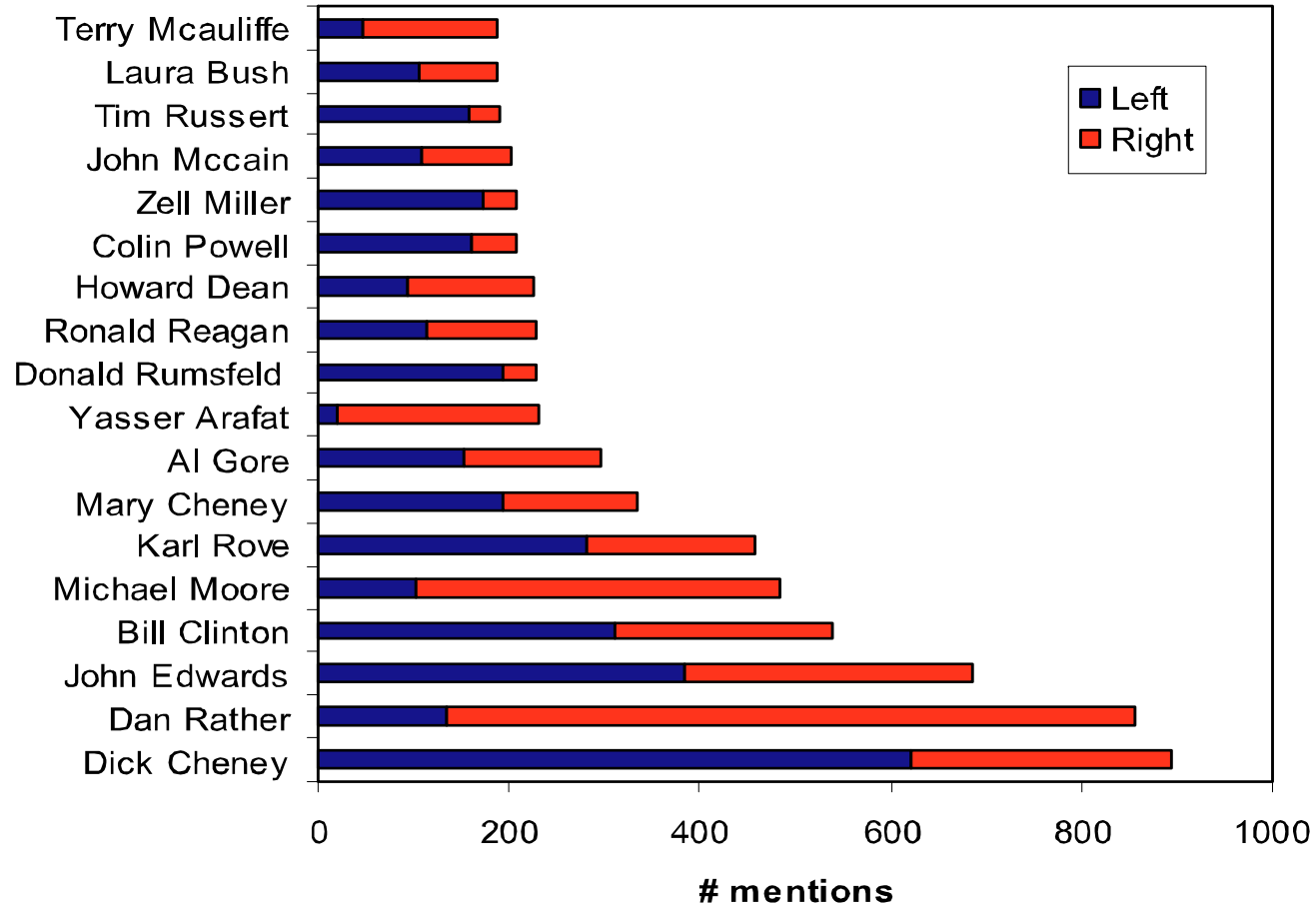
We can even invert the analysis, and see what phrases are similar...



## Network of phrases found on the same blogs



## Political figures being discussed

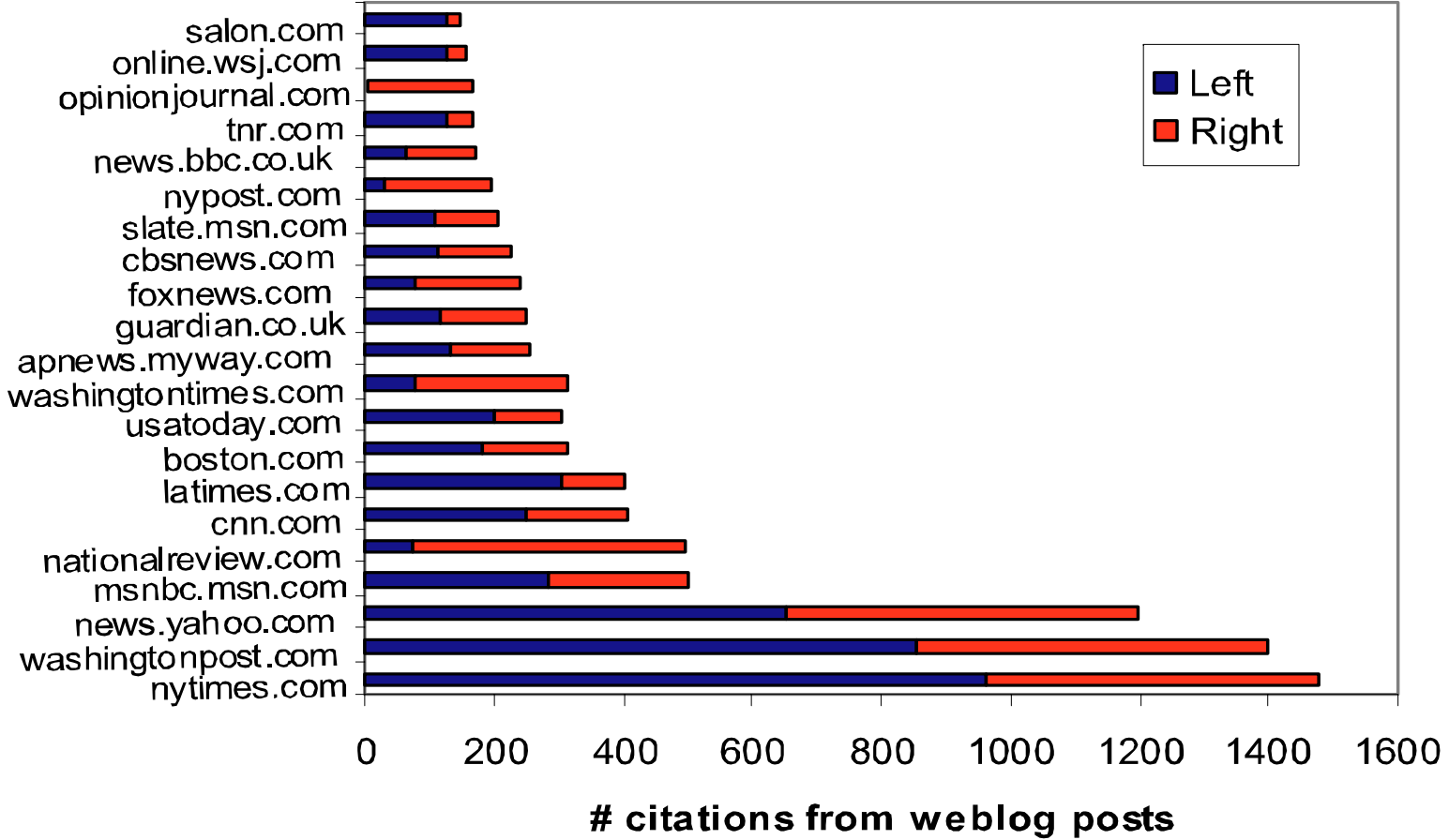


59% of the mentions of Kerry are by right leaning blogs

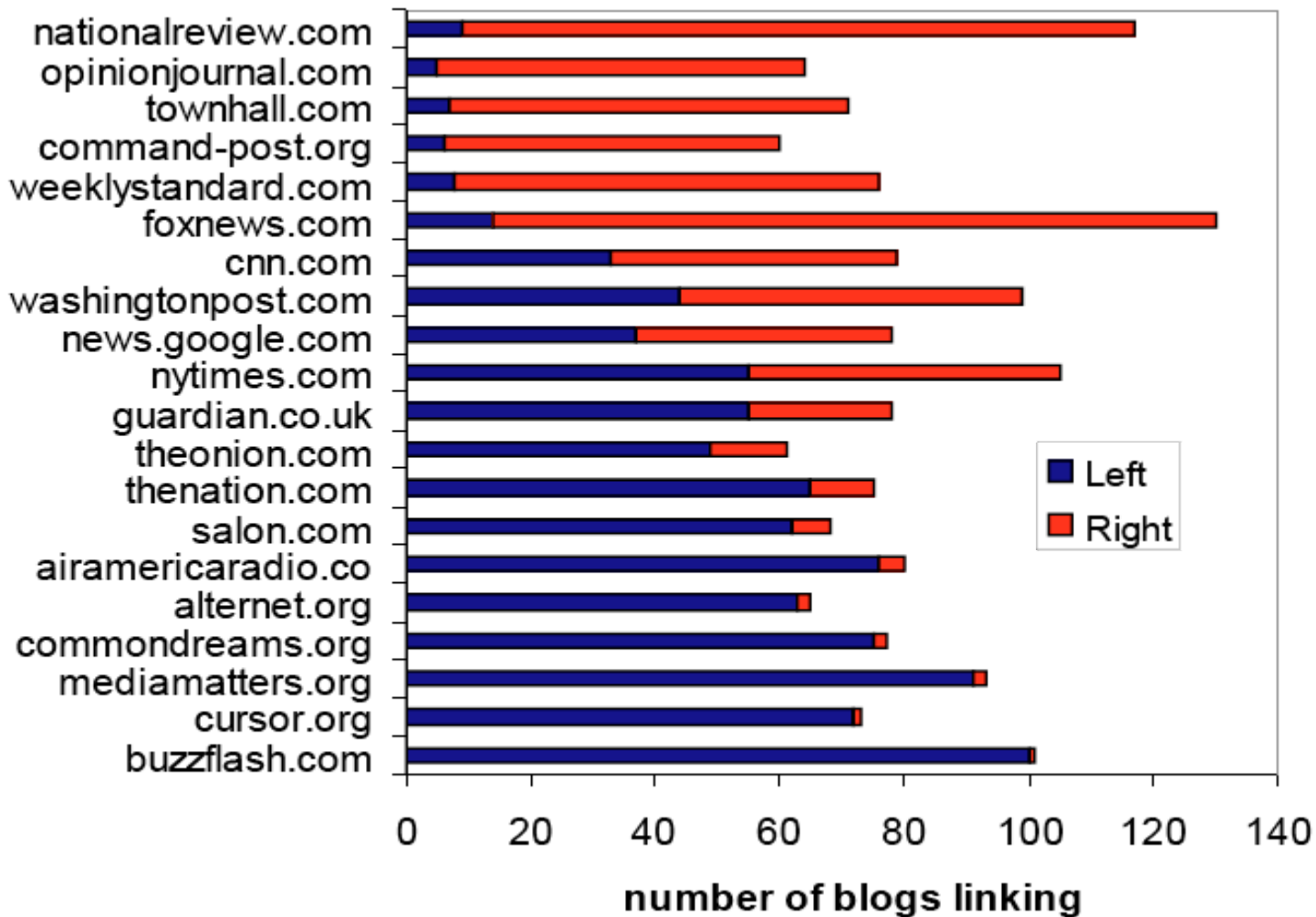
53% of the mentions of Bush are by left leaning blogs



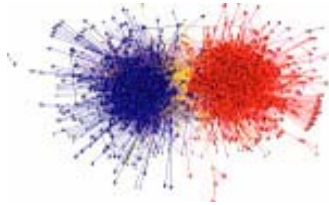
Mainstream media  
 cited about once every other post from the A-list bloggers  
 (6,762 times from the left, 6,364 from the right)



## Mainstream media bias (links from 1,400 blog set)



# Insights from the political blogosphere



Liberal and conservative blogs are balanced in numbers and tend to link primarily to their own communities

Conservative blogs are more likely to include links to other blogs on their pages, and their A-list blogs reference one another more frequently

Liberal and conservative blogs tend to discuss different things, but one is not more 'coherent' than the other

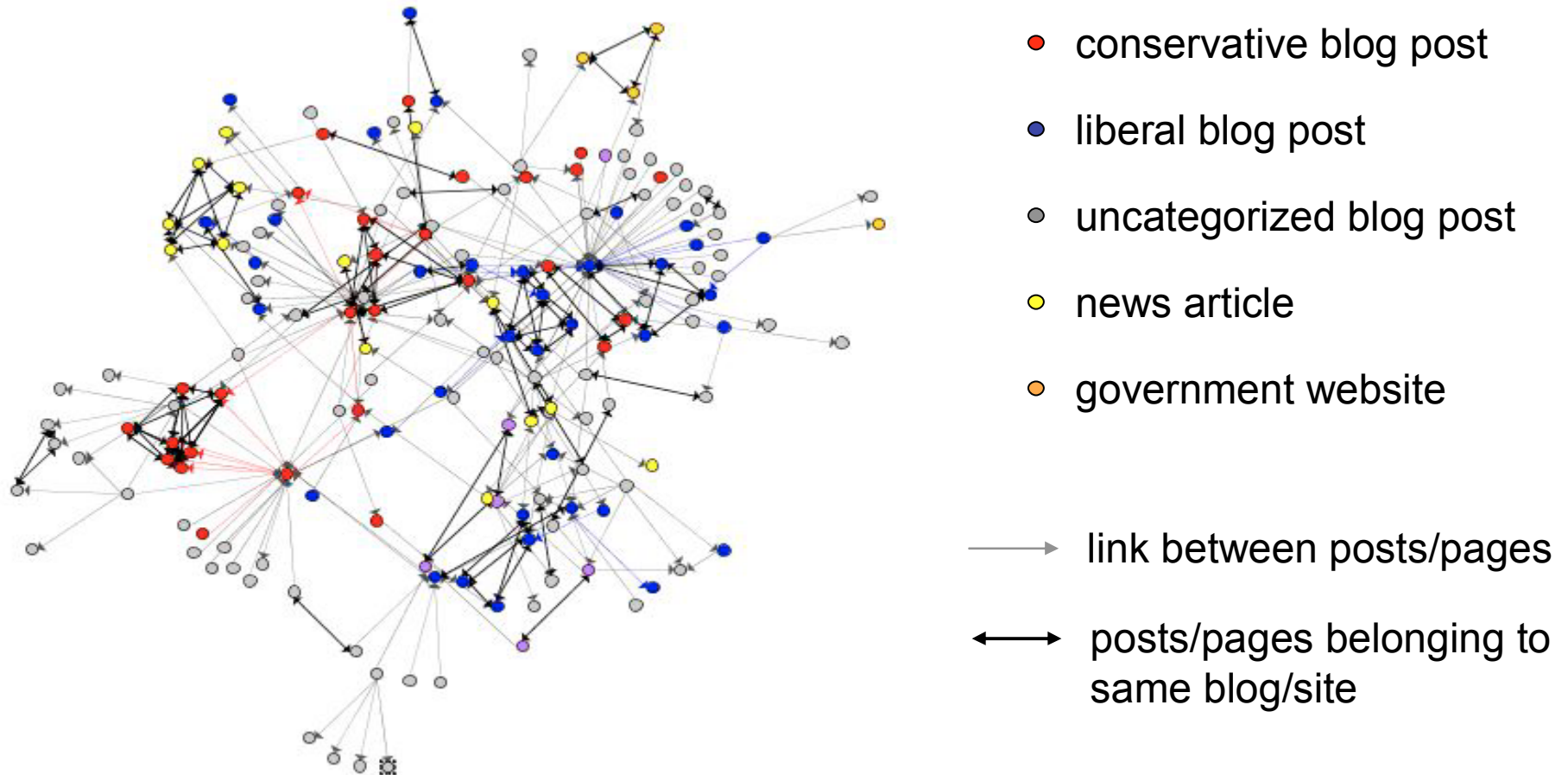
Different news sources are favored by differently leaning blogs

Easier to criticize opponents than support one's own position



# Trying to bridge the divide

## Opposition to the bankruptcy bill (March 2005)



but, bill was passed nevertheless: Senate 74 - 25 , House 302 - 126





**To find out more:**  
(papers, slides, other research in the group)

Information dynamics group (IDL) at HP Labs:

<http://www.hpl.hp.com/research/idl>

List of publications

[http://www.hpl.hp.com/personal/Lada\\_Adamic/research.html](http://www.hpl.hp.com/personal/Lada_Adamic/research.html)

