

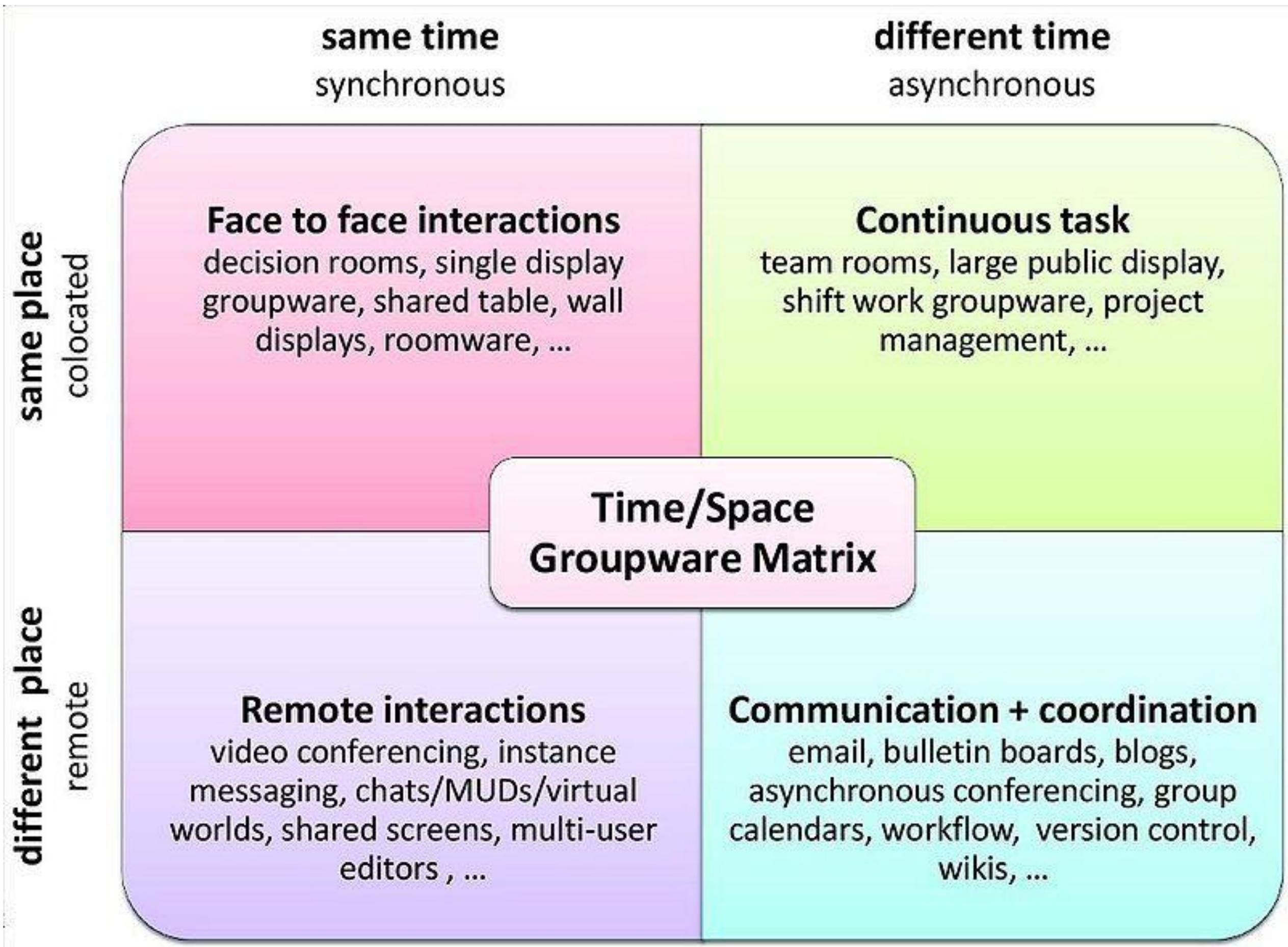
Social Software and MMOs

**MMO = massively multi-person, online...
games, crowds,**

John Canny
CSI60 Fall 2012

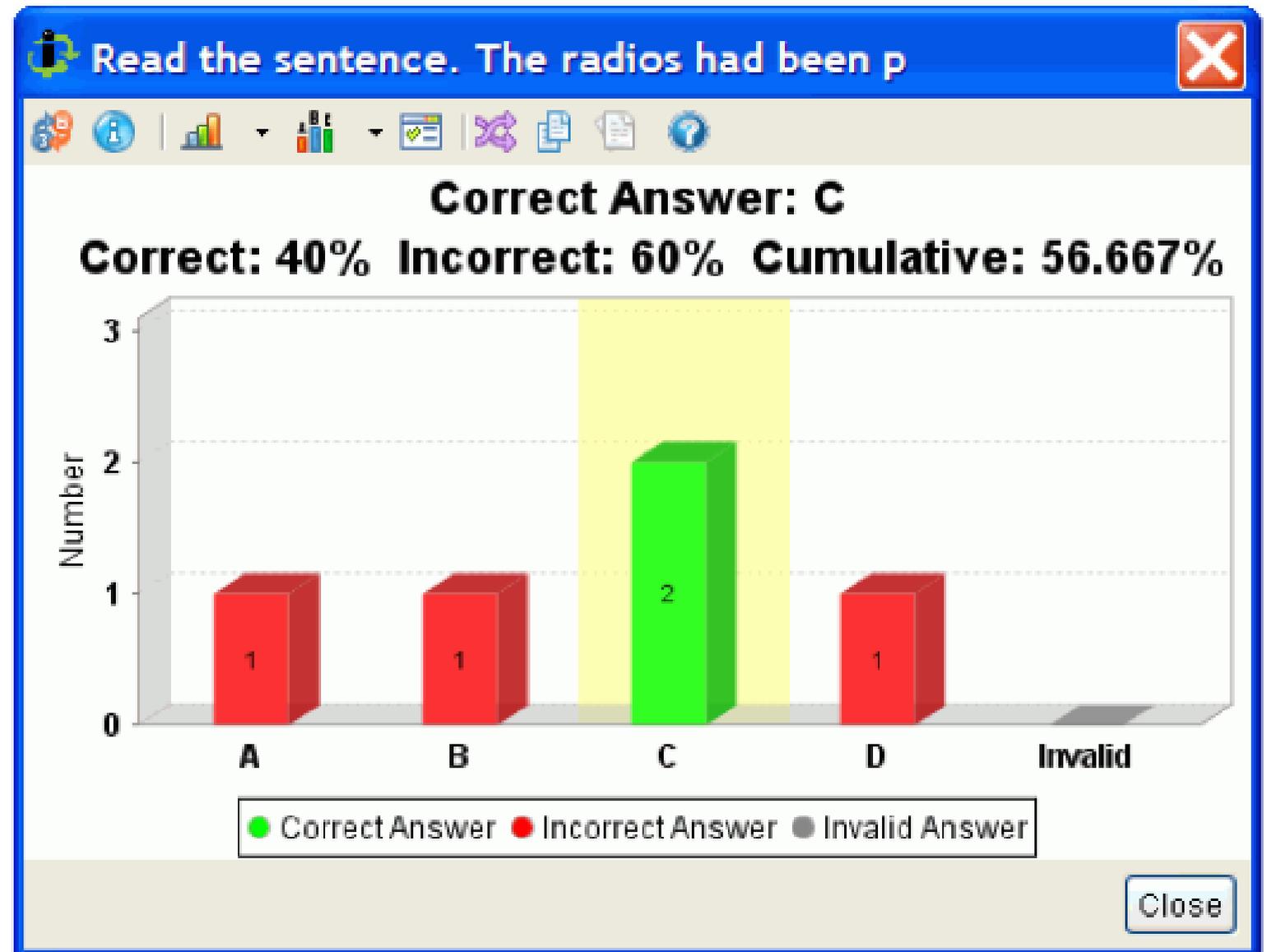
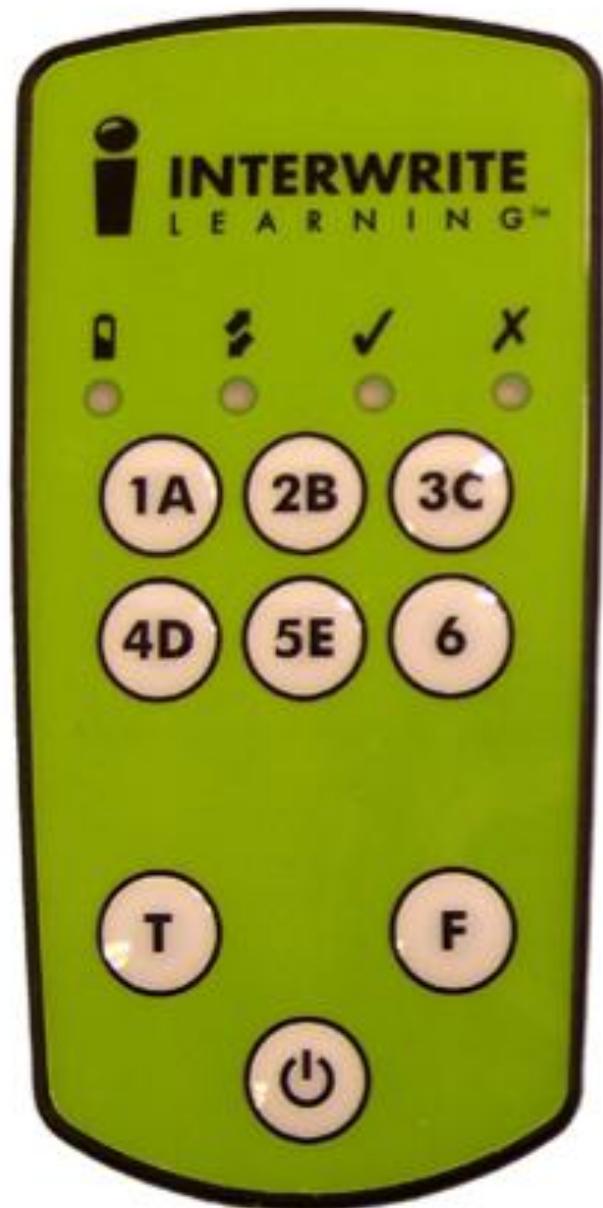
Social Software

	Same time (synchronous)	Different time (asynchronous)
Same place (co-located)	Face-to-face interactions	Continuous Task
Different place (remote)	Remote interactions	Communication + Coordination



Same Time, Same Place
(synchronous, co-located)

Personal Response Systems (Clickers)



Single Display Groupware

- “Computer programs which enable co-present users to collaborate via a shared computer with a single shared display and simultaneous use of multiple input devices.”



Single Display Groupware

- “Computer programs which enable co-present users to collaborate via a shared computer with a single shared display and simultaneous use of multiple input devices.”



“Roomware”



**Same Time, Different Place
(synchronous, remote)**

ClearBoard



by Hiroshi Ishii & Minoru Kobayashi

Special Thanks to Naomi Miyake and Jonathan Grudin

Face-to-face interactions

1. Voice (what is said)
2. Facial expressions
3. Gestures
4. Posture
5. Locus of attention

Being There (sort of)





AT&T Picturephone 1969
Source: Wikipedia



iPhone video

Video conferencing systems usually *are* inferior to Face-to-Face

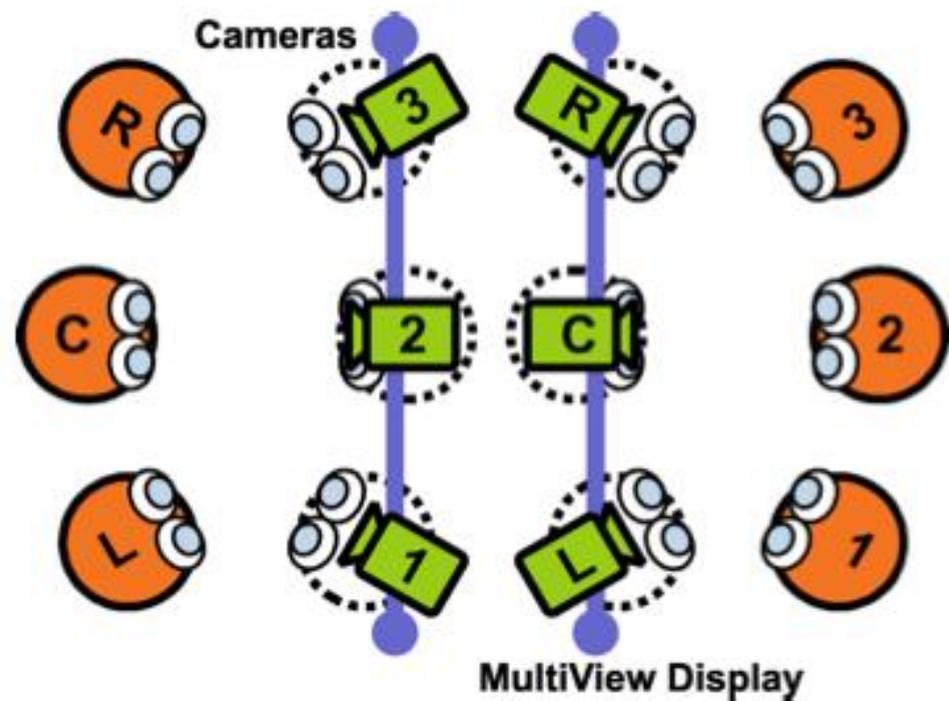
It is hard for participants to keep track of:

1. Gaze
2. Deixis (pointing)
3. Body language often missing

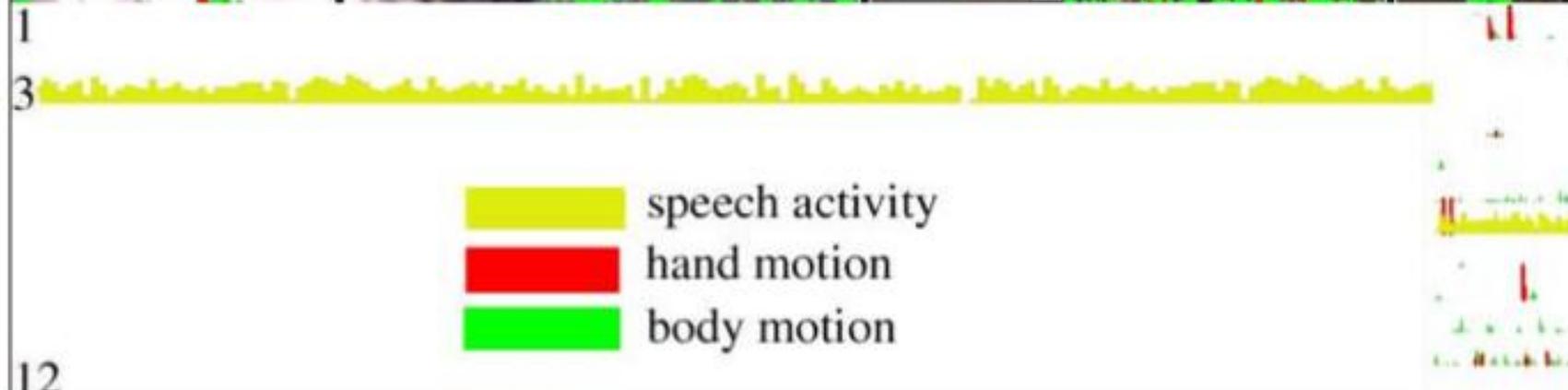
However, these are design problems that can be fixed

MultiView: Gaze affects Trust

Quasi-3D display,
gaze-faithful solution
for group conferencing



Online distance learning

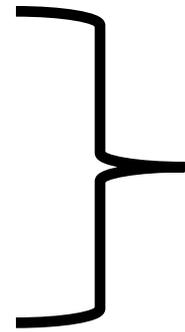


**“Face-to-Face” is the wrong model
for many social tasks!**

Non-verbal cues

Facial expression

Eye contact



Facial codes

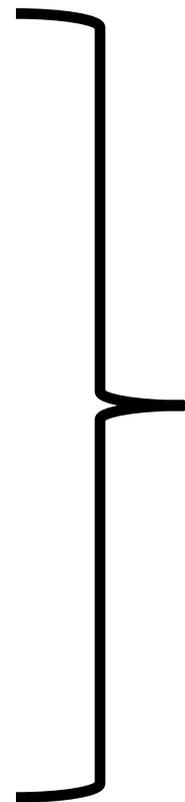
Conscious media

Posture

Gesture

Proxemics

Touch



Body codes

Unconscious media

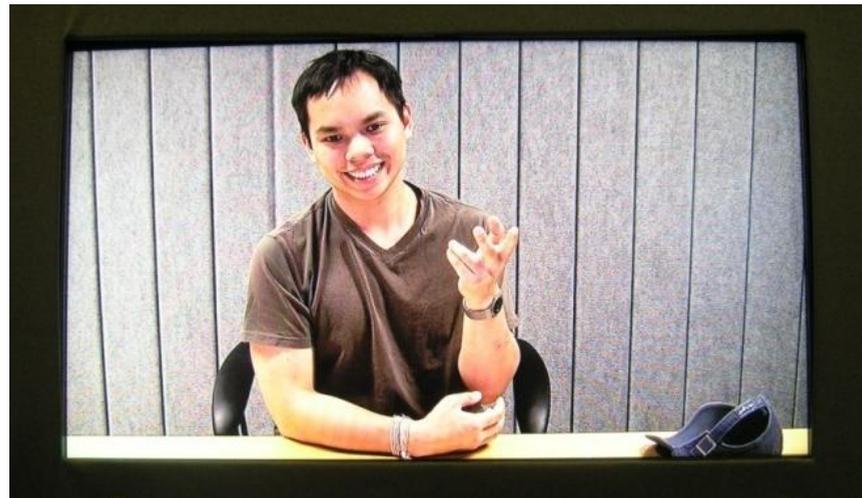
Chronemics, speech prosody, dress,...

An Experiment

Face to face



Upper-body
video



Face-only
video



Measuring Empathy: Help!!

Empathy \Leftrightarrow willingness to help.



Pen-drop experiment

Subjects meet 1-1 in expt. condition, talk about philanthropy

They go to separate rooms, fill out the questionnaire.

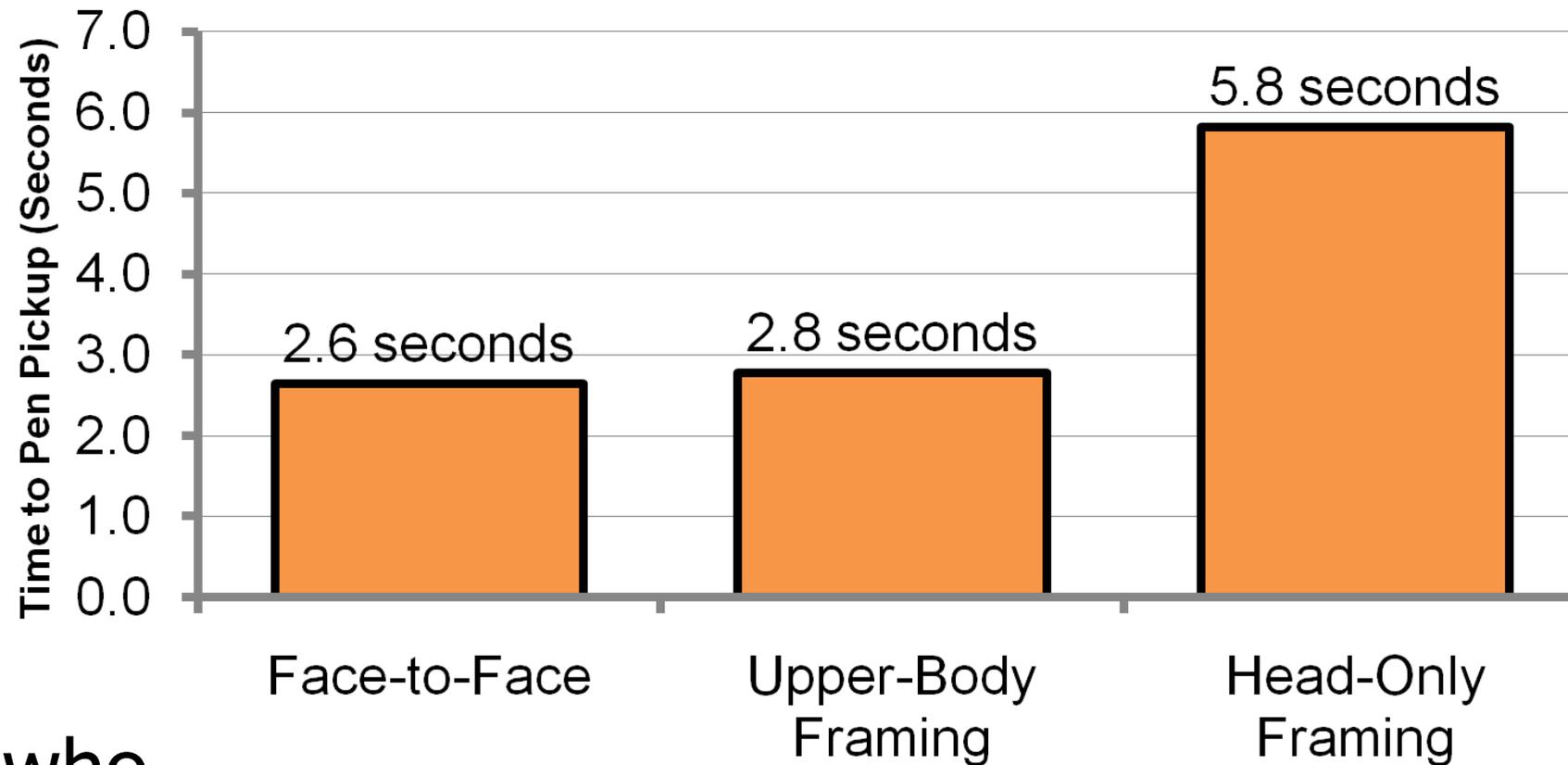
Then one subject is coached on pen-dropping.

Dropper enters the room where the other subject (the "helper") is, carrying books and pen.

Dropper "**accidentally**" **drops pen**, helper may or may not try to pick it up.

Results: Pen drop

Time to Pen Pick-Up by Framing



Number who

Picked up

12

11

5

Significant differences between head-only framing and face-to-face ($p < 0.003$) and upper-body framing ($p < 0.01$).

**Different Time, Different Place
(Asynchronous, Remote)**

Examples:

1. Email
2. Wikis
3. Blogs
4. Facebook
5. BBS (Discussion boards)

Track Changes

end option congue nihil
at facer possim assum

elit, sed diam *Lorem ipsum*
tincidunt ut laoreet dolore
 enim ad minim veniam,
uscipit lobortis nisl ut
s autem vel eum iriure
molestie consequat, vel

Samantha Smith, 4/8/04 11:22 AM:
Inserted

1 2

Samantha Smith 4/8/04 11:08 AM
Deleted: consectetur

Samantha Smith 4/8/04 11:14 AM
Formatted: Font:Bold

3

Visual Diff

Changes to /rehearse-processing/trunk/app/src/edu/stanford/hci/helpmeout/HelpMeOutTool.java

r201 vs. r203 [Edit](#)

[r201](#) **[r203](#)** [r233](#)

Code review of r203

Go to:

Double click a line to add a comment

[/rehearse-processing/trunk/app/src/edu/stanford/hci/helpmeout/HelpMeOutTool.java](#) r201

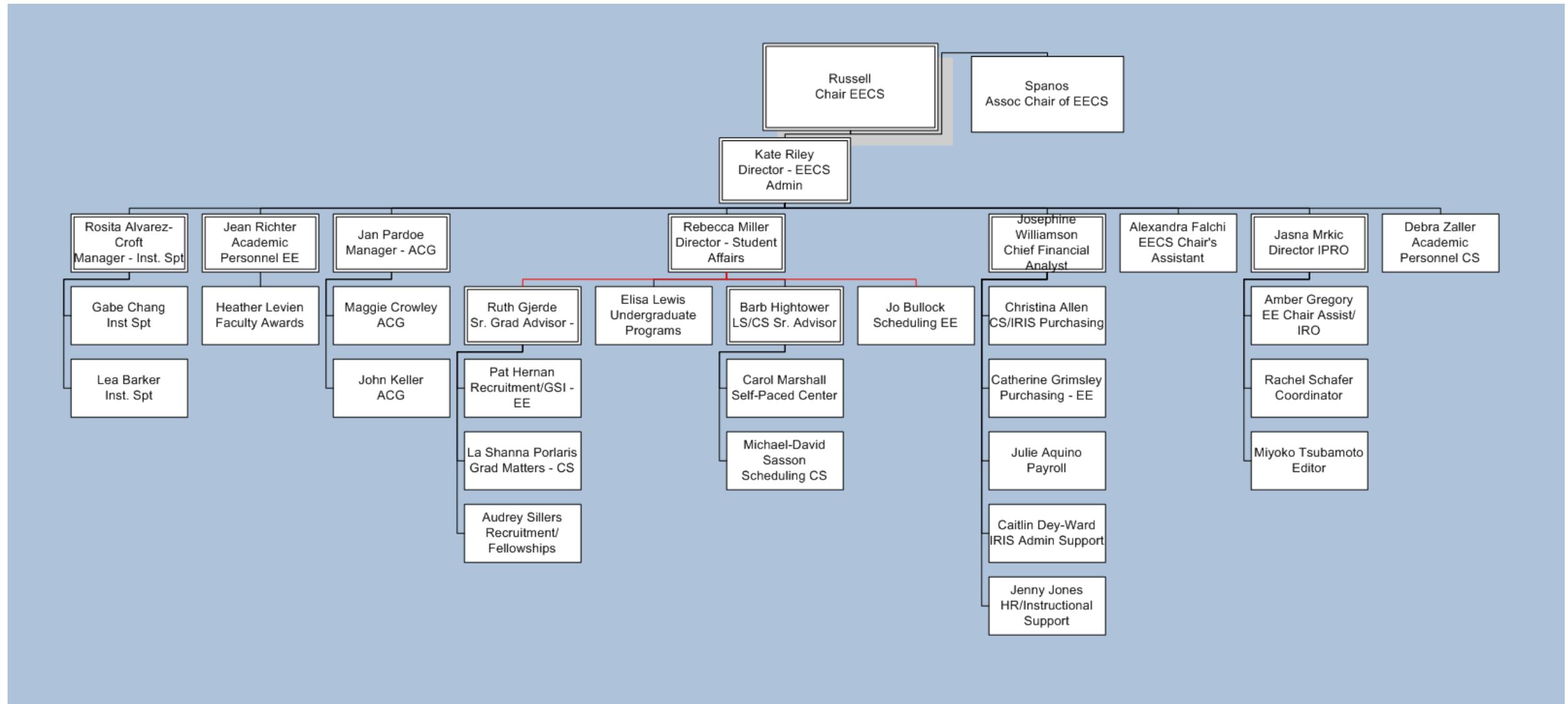
```
1 /**
2  *
3  */
4 package edu.stanford.hci.helpmeout;
5
6 import java.awt.Color;
7 import java.awt.Container;
8 import java.awt.Toolkit;
9 import java.awt.datatransfer.Clipboard;
10 import java.awt.datatransfer.StringSelection;
11 import java.awt.datatransfer.Transferable;
12 import java.awt.event.WindowEvent;
13 import java.awt.event.WindowListener;
14 import java.util.HashMap;
15 import java.util.Map;
16 import java.util.Set;
17
18
19 import javax.swing.JFrame;
20
21 import javax.swing.JScrollPane;
22 import javax.swing.JTextPane;
23 import javax.swing.event.HyperlinkEvent;
24 import javax.swing.event.HyperlinkListener;
25
26
27 import processing.app.Editor;
```

[/rehearse-processing/trunk/app/src/edu/stanford/hci/helpmeout/HelpMeOutTool.java](#) r203

```
1 /**
2  *
3  */
4 package edu.stanford.hci.helpmeout;
5
6 import java.awt.Color;
7 import java.awt.Container;
8
9 import java.awt.event.WindowEvent;
10 import java.awt.event.WindowListener;
11 import java.util.HashMap;
12 import java.util.Map;
13 import java.util.Set;
14
15 import javax.swing.BorderFactory;
16 import javax.swing.BoxLayout;
17 import javax.swing.ImageIcon;
18 import javax.swing.JFrame;
19 import javax.swing.JLabel;
20 import javax.swing.JScrollPane;
21 import javax.swing.JTextPane;
22 import javax.swing.event.HyperlinkEvent;
23 import javax.swing.event.HyperlinkListener;
24
25 import edu.stanford.hci.helpmeout.HelpMeOutPreferences.Usage;
26
27 import processing.app.Base;
28 import processing.app.Editor;
```

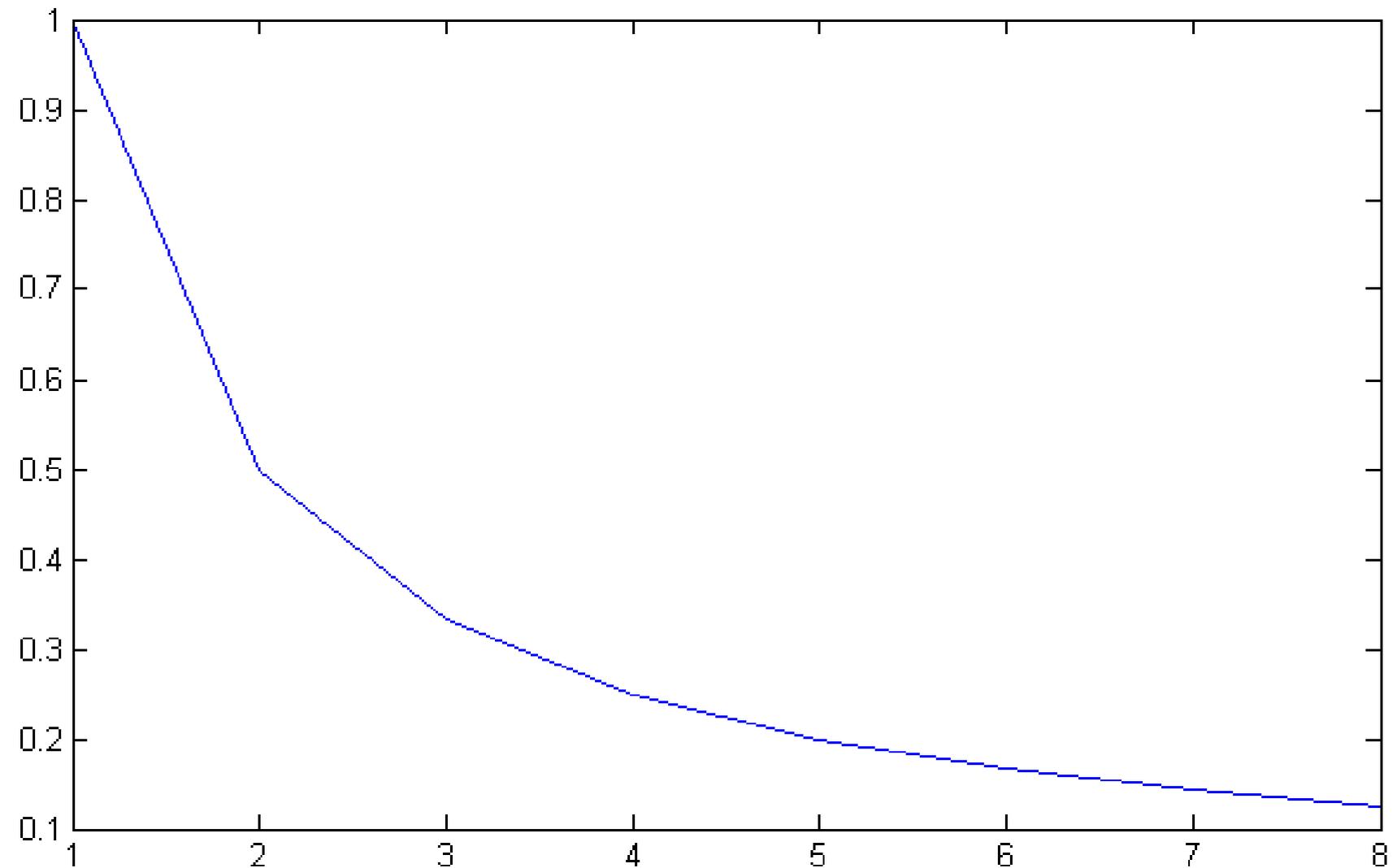
Social Media Participation

“Work” systems support hierarchies



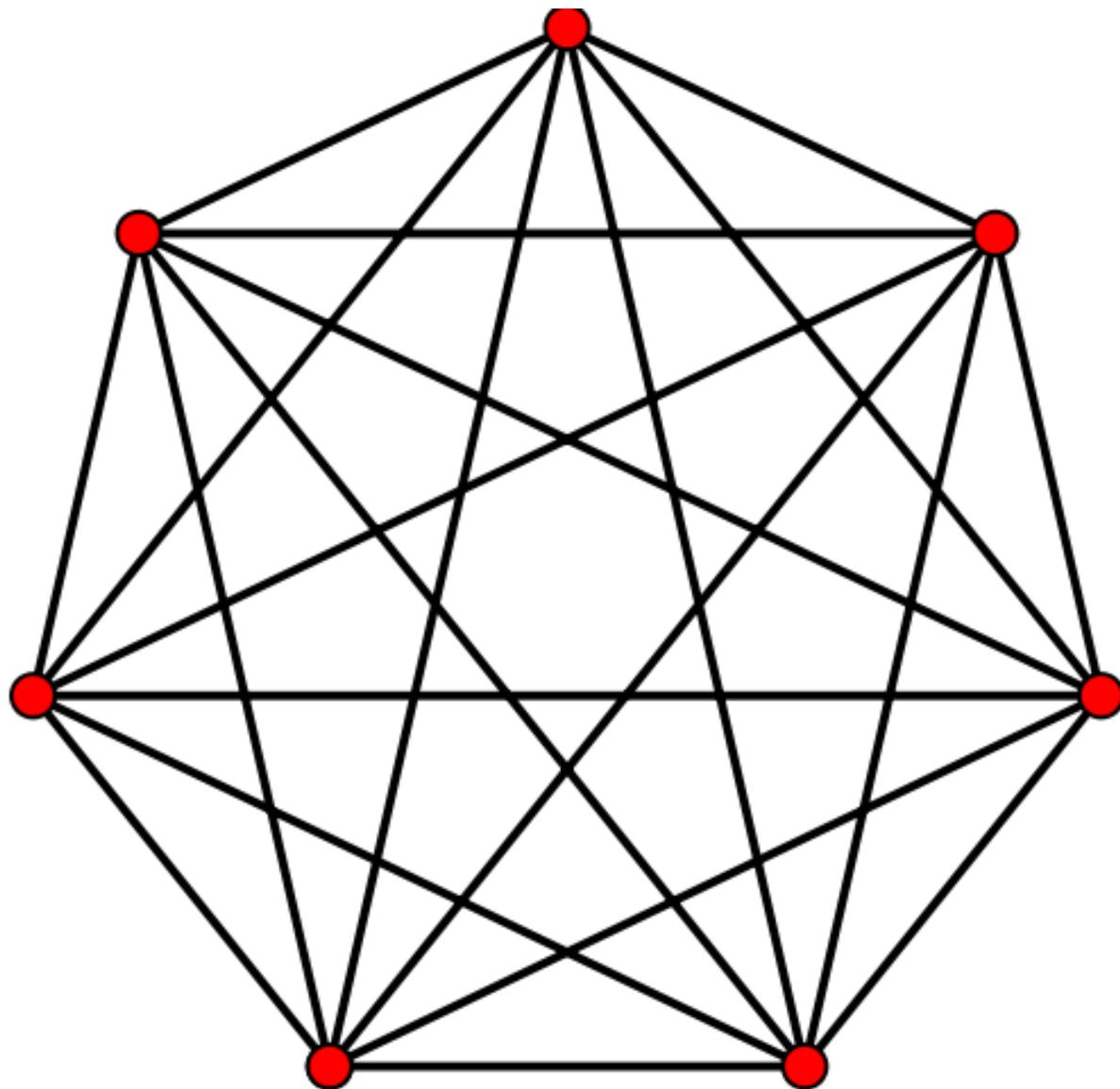
Participation in Live Groups

Relative participation

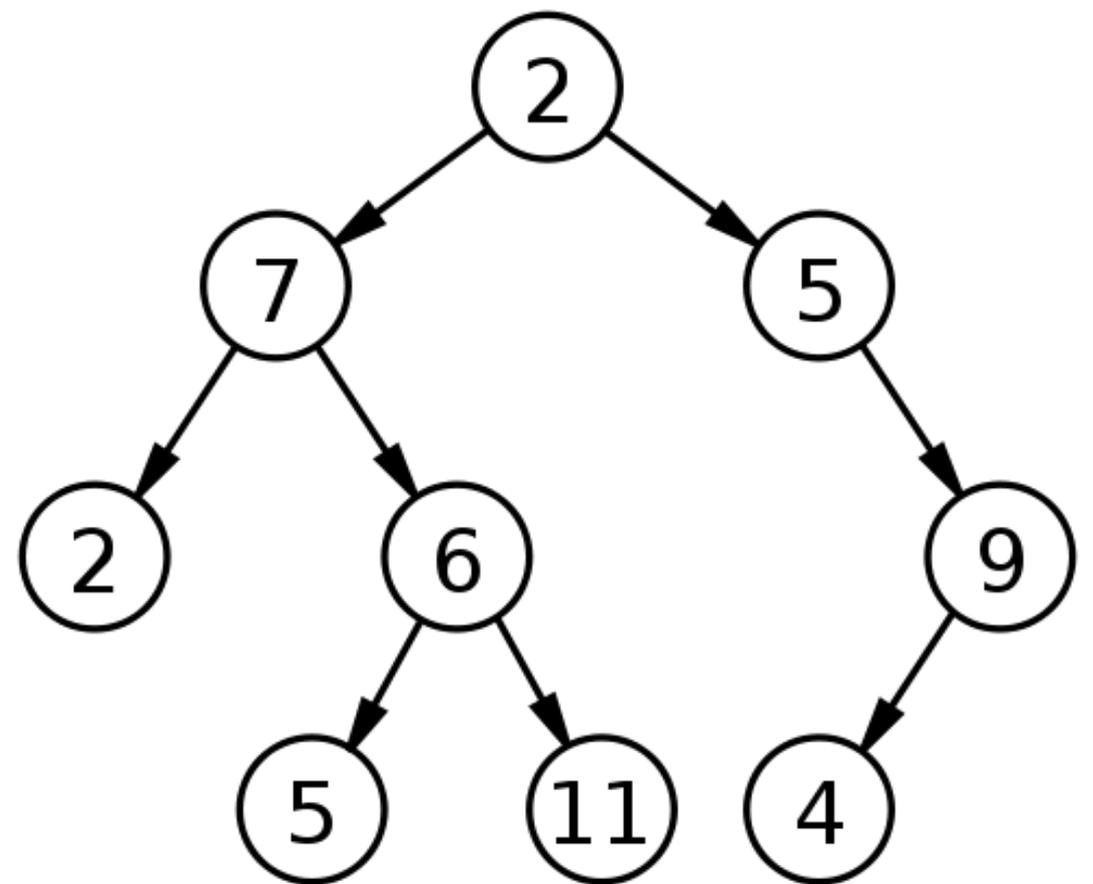


Rank of user

Elementary Graph Theory



of edges in a fully connected graph:
 $n \cdot (n-1) / 2$ $\sim n^2$



of edges in a tree:
 $n-1$

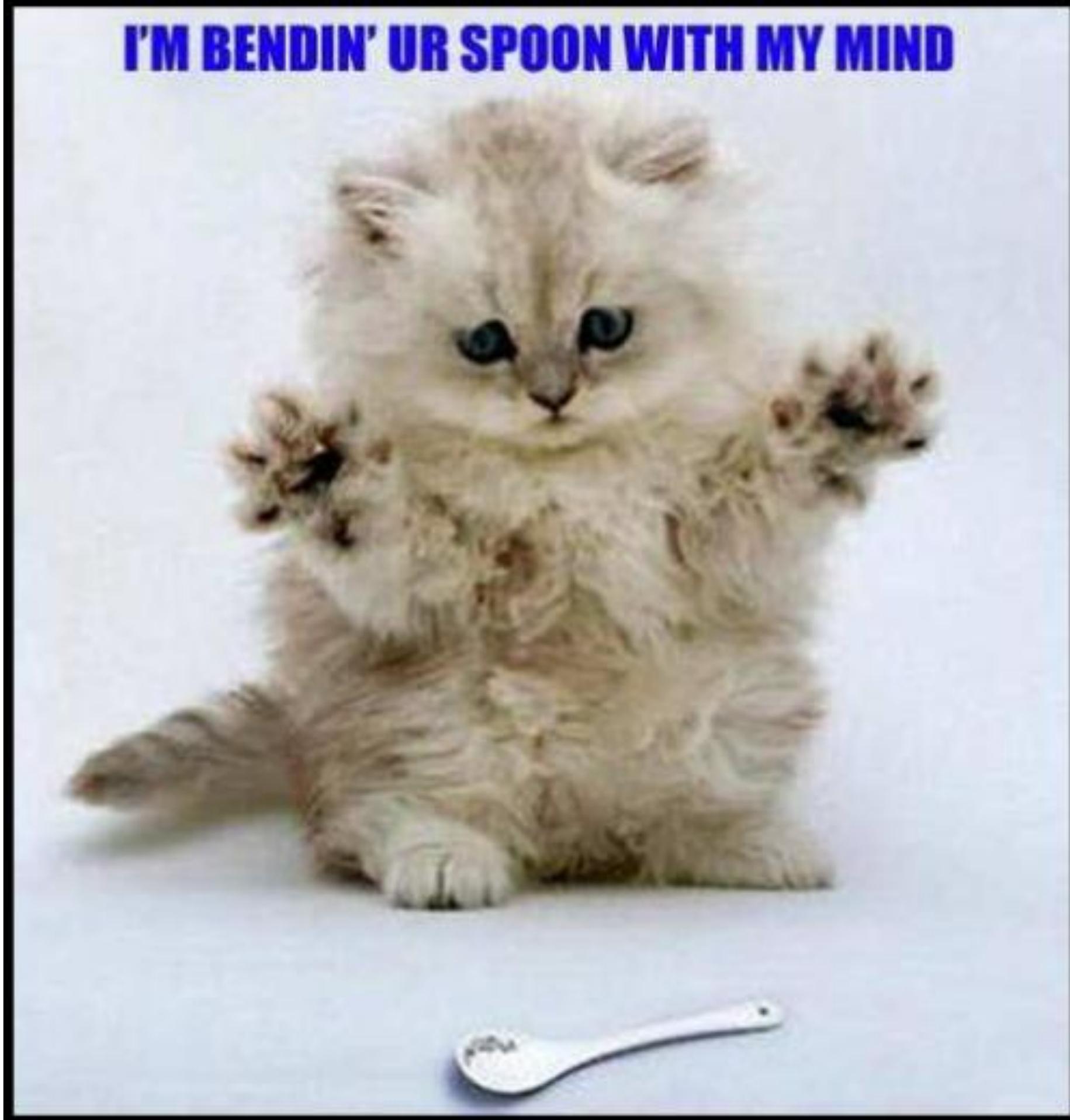
The Benefits of Hierarchical Organization

- **Ronald Coase** (Nobel laureate),
The Nature of the Firm (1937):
- Hierarchical organizations (institutions) can be more efficient than open labor markets, because they limit transaction costs.

Managing Many/many communication

- Search tools – find what you want from clues
- Recommenders – find what you probably want from your history
- Social software – find what your friends liked

I'M BENDIN' UR SPOON WITH MY MIND



(User contributed image descriptions)

More useful than LOLcats.

Flickr: Night Lights

www.flickr.com/groups/nightlights/

Signed in as [bpunkt](#) [Help](#) [Sign Out](#)

Home You Organize & Create Contacts Groups Explore

Search this group's pool [Search](#)

Night Lights

Group Pool Discussion 25,697 Members Map Join This Group

Share This

Group Pool [227,687 items](#) | Only members can add to the pool. [Join?](#)

NEW From [Swedeitis](#)

NEW From [wolfcat aus](#)

NEW From [deanandjon](#)

NEW From [deanandjon](#)

NEW From [deanandjon](#)

NEW From [deanandjon](#)

NEW From [playces](#)

NEW From [playces](#)

NEW From [Vicnaba](#)

NEW From [Vicnaba](#)

NEW From [Vicnaba](#)

NEW From [Vicnaba](#)

Discussion [71 posts](#) | Only members can post. [Join?](#)

[» More](#)

1. El Farolito

Category: Mexican

Neighborhood: Mission

Meals Served: Dinner

Price: \$

★★★★☆ 1173 reviews

2779 Mission St
San Francisco, CA 94110
(415) 824-7877



Their claim to fame is the "super burrito" (and especially the chile relleno super burrito) which is huge, moist, and flavorful. A **cheap** and filling dinner in the Mission district, and a **cheap**

2. La Oaxaqueña Bakery and Restaurant

Categories: Mexican, Bakeries

Neighborhood: Mission

Meals Served: Dinner

Price: \$

★★★★☆ 158 reviews

2128 Mission St
San Francisco, CA 94110
(415) 621-5446



Jeff had another work assignment at 16th and Mission and texted me to see if I was free to meet him during his lunch break, which is **dinner** for most folks. I don't see my guy as much as I'd like, so

3. Valencia Pizza & Pasta

Categories: Pizza, Italian, Breakfast & Brunch

Neighborhood: Mission

Meals Served: Dinner

Price: \$

★★★★☆ 202 reviews

801 Valencia St
San Francisco, CA 94110
(415) 642-1882



A redeeming feature was the wine that we could pick by the bottle and it was about \$15 per bottle. Sure it was a **cheap dinner**, my boyfriend and I walked away paying about \$45 but I'd rather pay a bit more

4. El Farolito

Category: Mexican

Neighborhood: Mission

Meals Served: Dinner

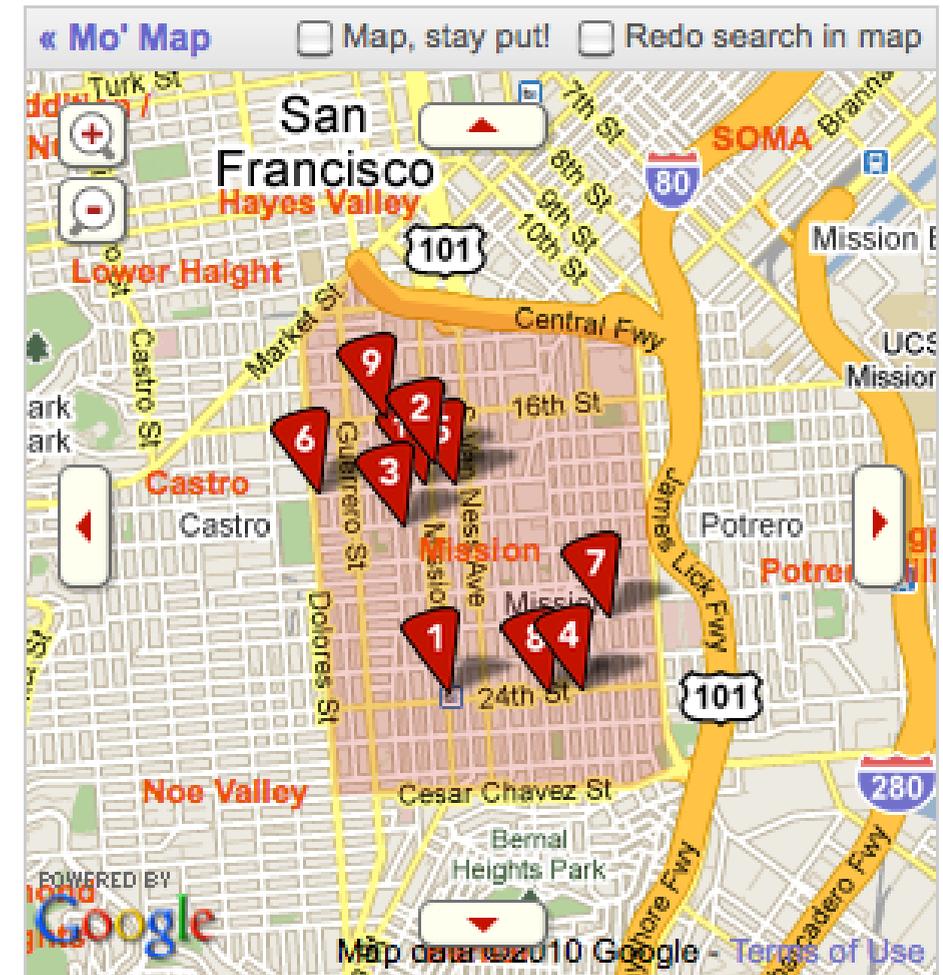
Price: \$

★★★★☆ 350 reviews

2950 24th St
San Francisco, CA 94110
(415) 641-0758



I was craving some good ol **cheap** Mexican food, and I stumbled upon this gem on Yelp. Thanks to Yelp again! If you are looking for a **cheap** hearty FREAKIN DELICIOUS Mexican food, then El Farolito's



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Dollar Bin
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Credits
Subscriptions
Corporate Accounts
Store

Lightboxes
Most popular files
Browse recent
Browse categories

Articles
Forums
Designer Spotlight

Support
FAQs

How to sell stock



4458 search results for Input Device

Displaying 1 to 30 of 4458 matches.

1 | 2 | 3 | 4 of 149 >

 #525141	 #65874	 #11247117	 #2964129	 #354970	 #10586097
 #497756	 #11242381	 #2749003	 #12534167	 #12565550	 #12542128
 #12521065	 #12520754	 #12544874	 #5584729	 #11216990	 #6610599

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\$17.59



10% buy

[Programming Collective Intelligence](#) ★★★★★☆ (56)

\$17.59



8% buy

[Visual Thinking: for Design](#) ★★★★★★ (3)

\$31.96



4% buy

[Getting Started with Arduino](#) ★★★★★☆ (34)

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Check a corresponding box or enter your own tags in the field below.

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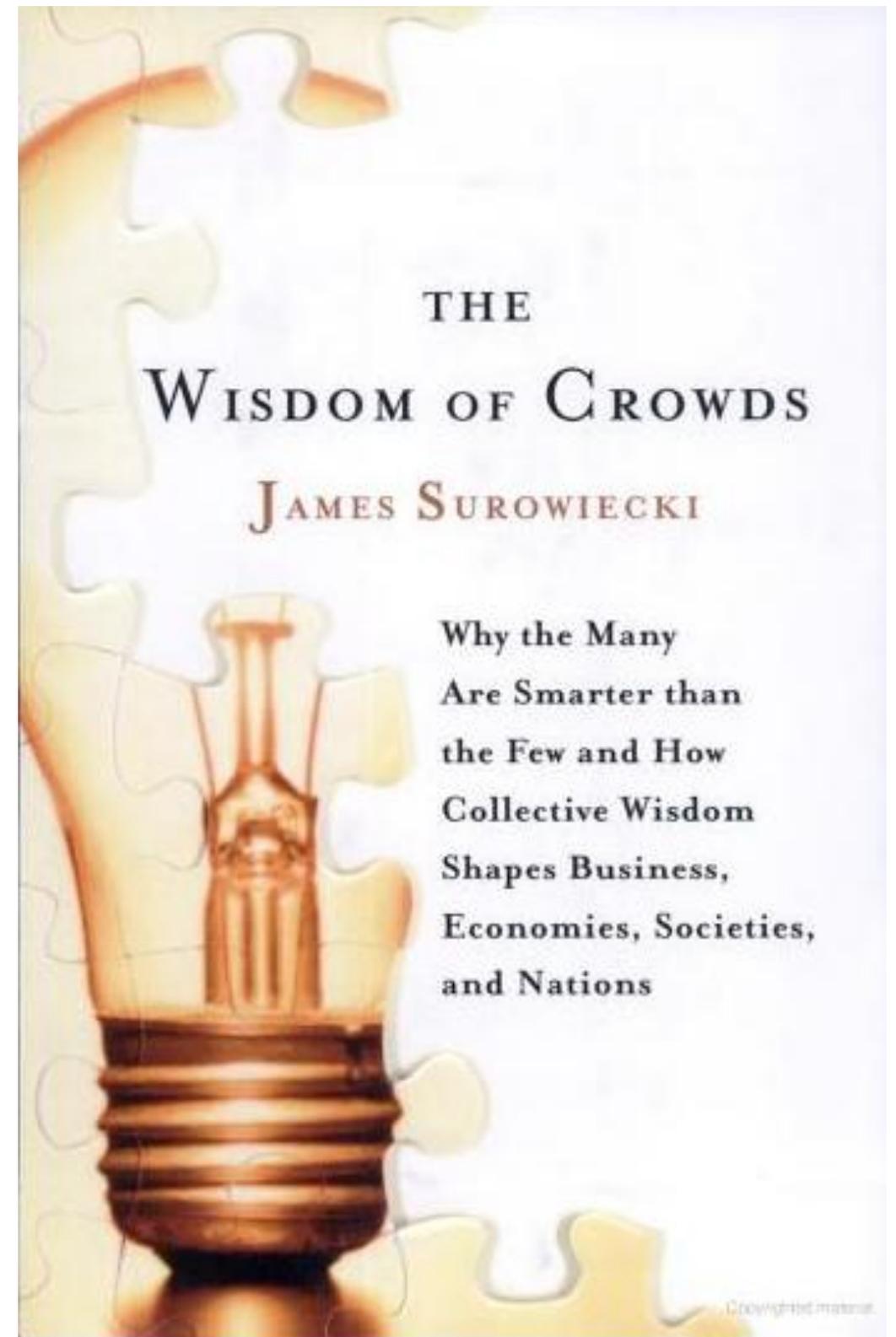
Search Products Tagged with

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> [See most popular Tags](#)

Wisdom of Crowds (Surowiecki)

- Crowds can be effective at:
- Predictions
(prediction markets)
- Solving tough problems
(InnoCentive)
- Causing / creating change
- Collecting / filtering info
(Digg, Delicious)
- Democratizing production
(crowdsourcing)



Social Dynamics of MMOs

Social Dynamics of MMORPGs

- Reward structure in WoW: careful progression of playing time with levels:

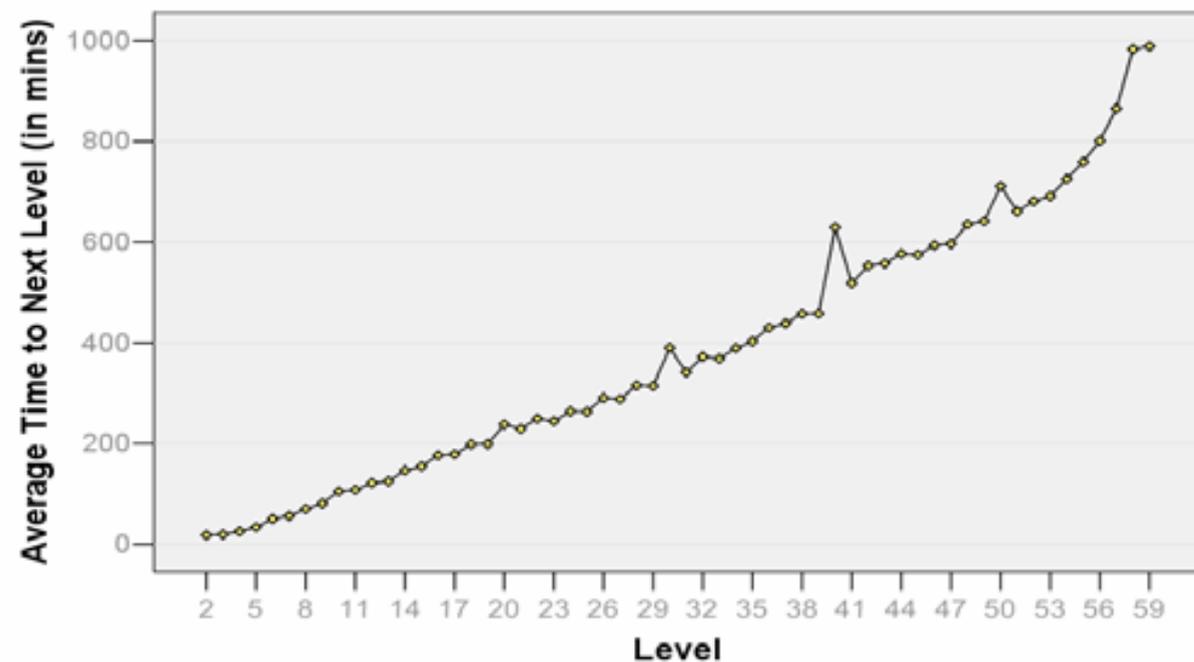


Figure 2 - Average time required to reach a level

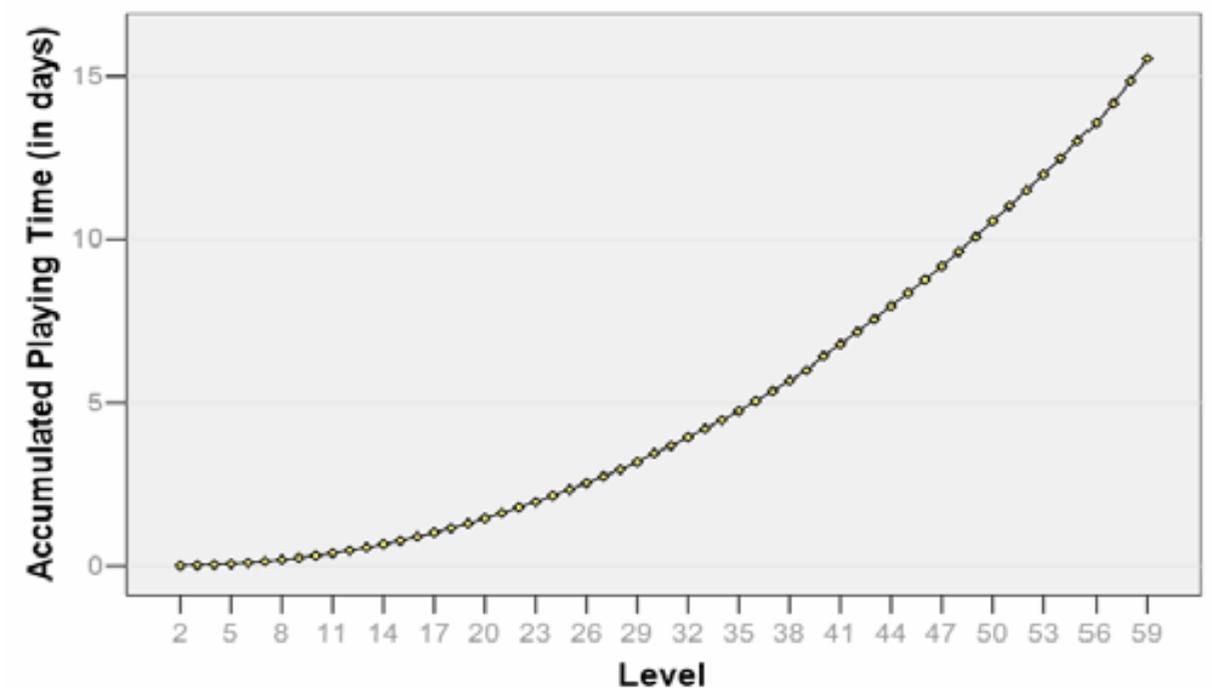


Figure 3 - Average accumulated play time by level

- i.e. WoW is extremely strong as a single-player game.

Social Dynamics of MMORPGs

- World of Warcraft, the most successful MMORPG in history.
- Encouraged social play via group quests and guilds.



Groups in WoW

- WoW encourages group play in two ways:
 - Characters have complementary abilities
 - Groups are required to perform harder quests

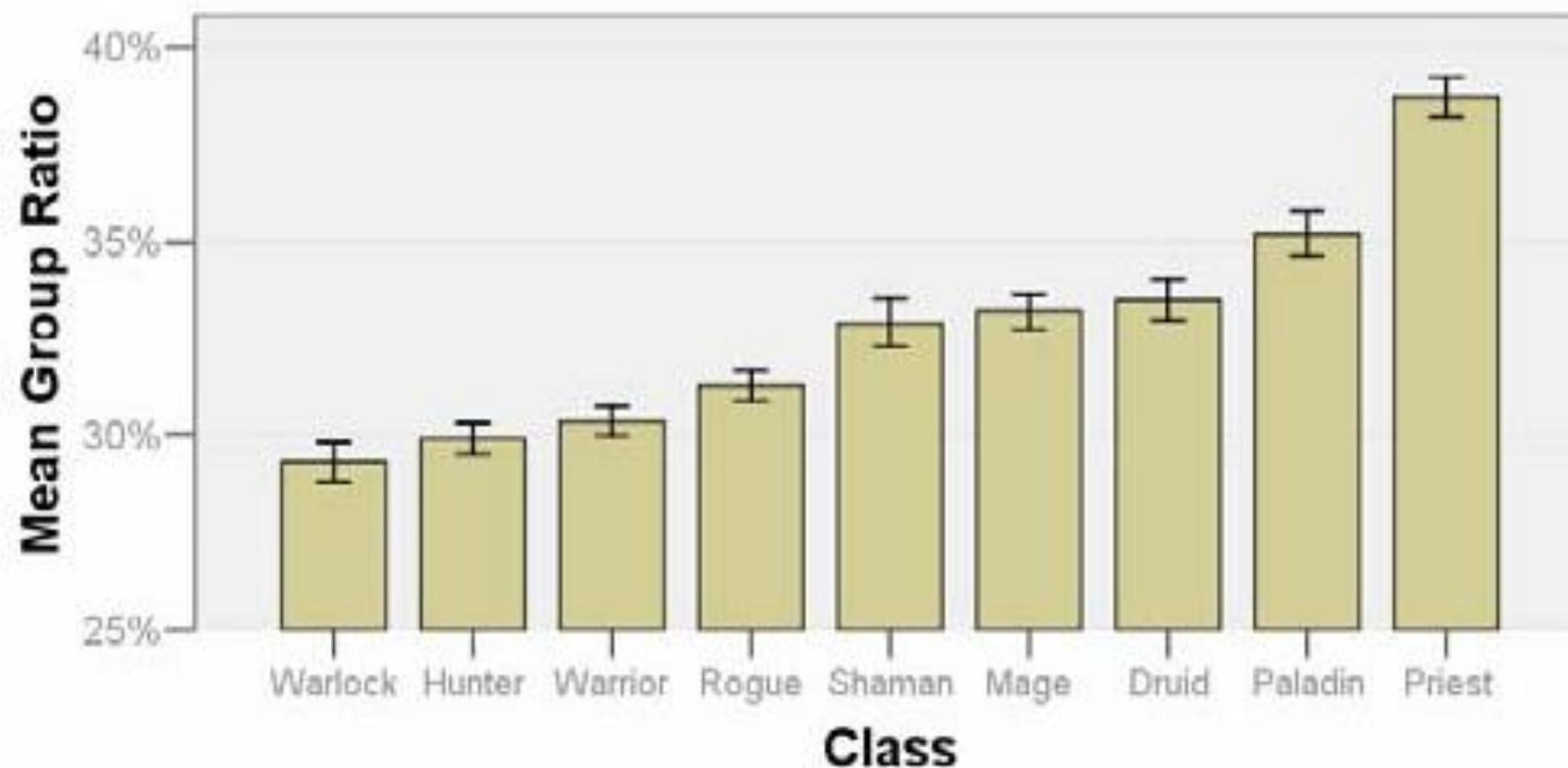


Figure 4 - Average time spent in a group, by class

Groups in WoW

- WoW encourages group play in two ways:
 - Characters have complementary abilities
 - Groups are required to perform harder quests



Figure 4 - Average time spent in a group, by class

Groups in WoW

- Group play as a function of level:

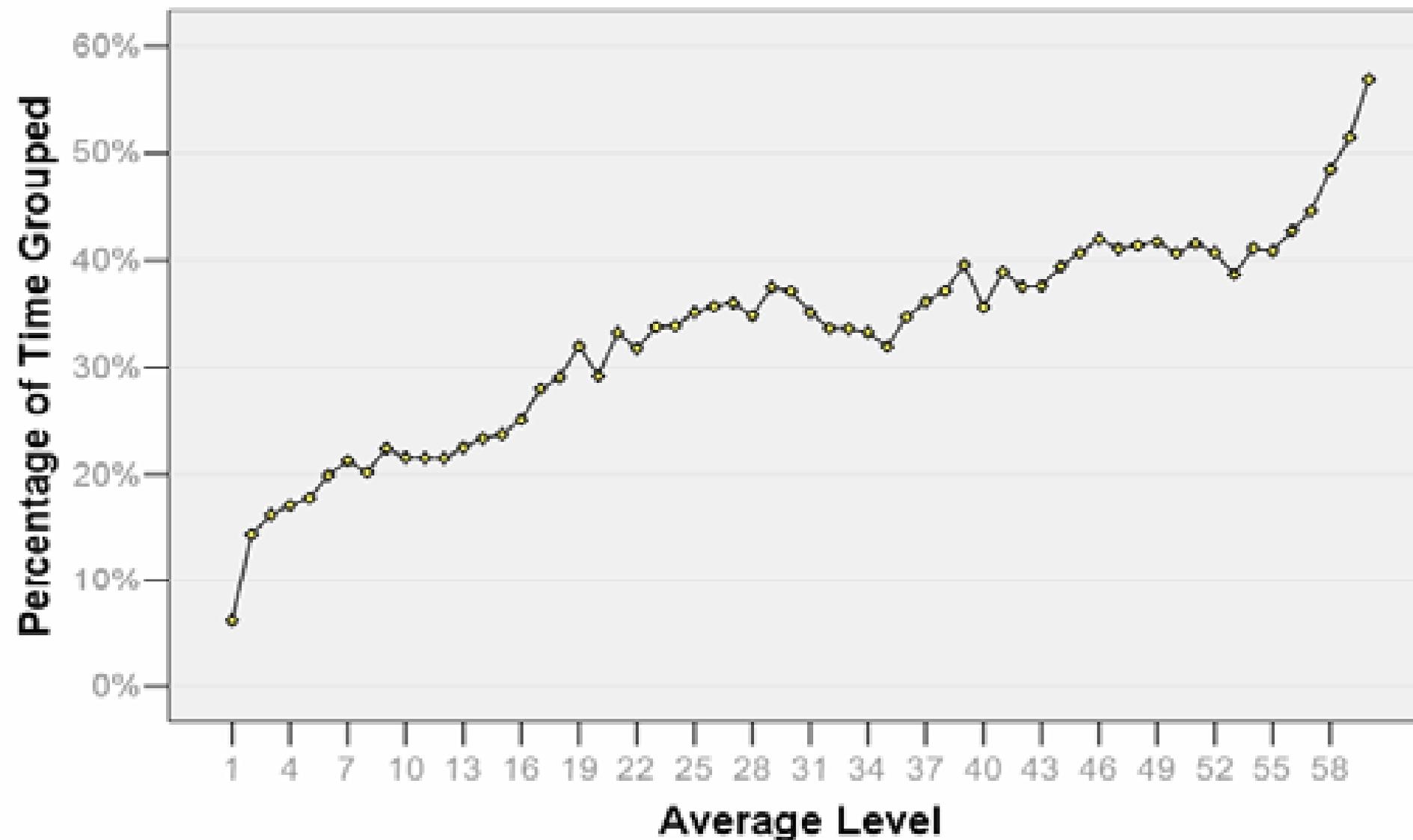


Figure 5 - Fraction of time spent in groups, by level

Groups in WoW

- Leveling time as a function of time spent in groups

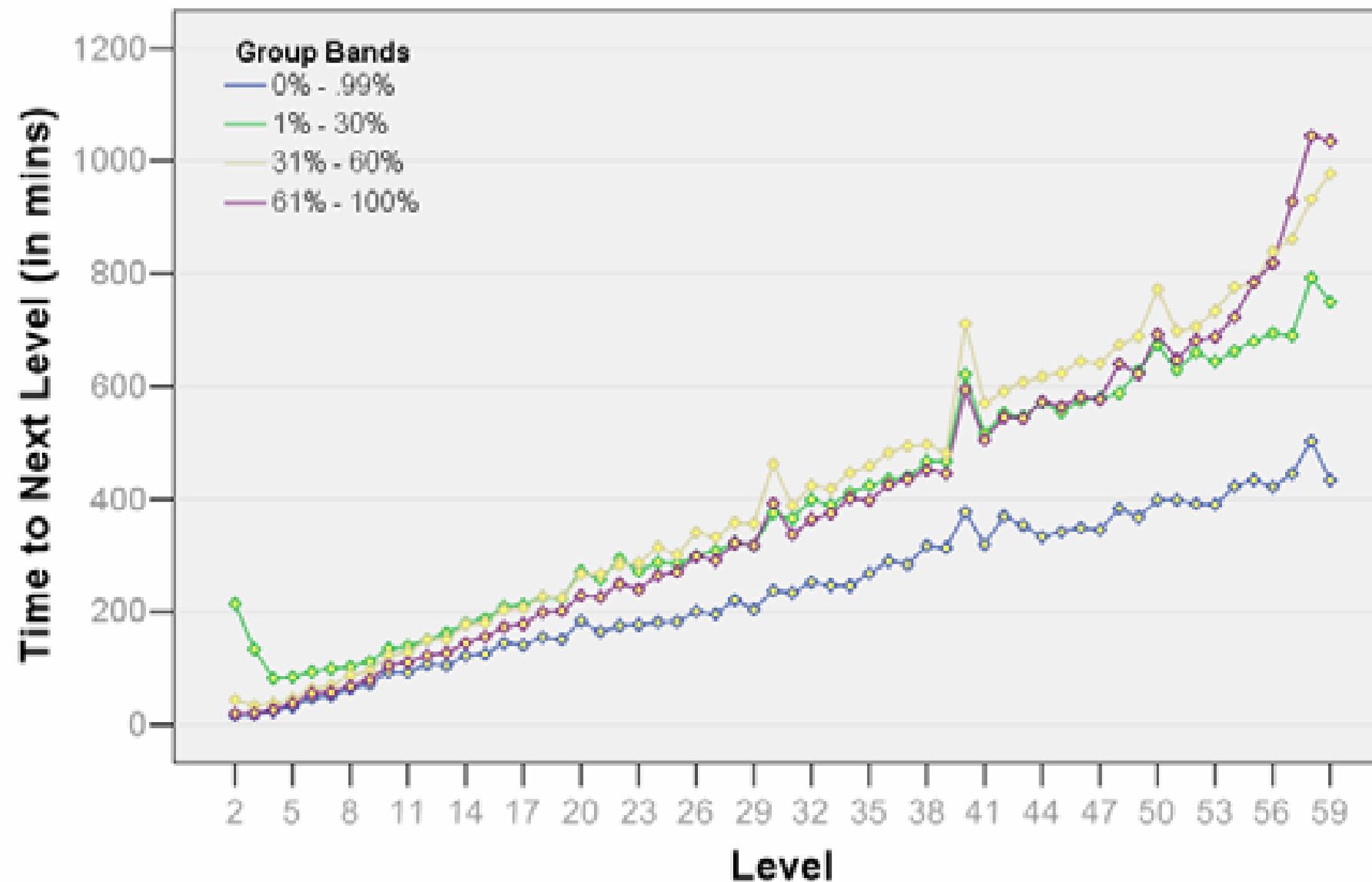


Figure 6 - Impact of grouping on leveling time

Guilds

- Guilds are long-lived groups of players created by the players themselves.
- Guilds are groups of players who know each others' skills and can work together regularly to meet challenges.
- They should be at the same level so they are motivated by the same quests.
- Guild membership is about 66% overall, and 90% at level 43 and above.

Guilds and playing time

- Guild members have some dependence on each other, and create pressure for players to play more.

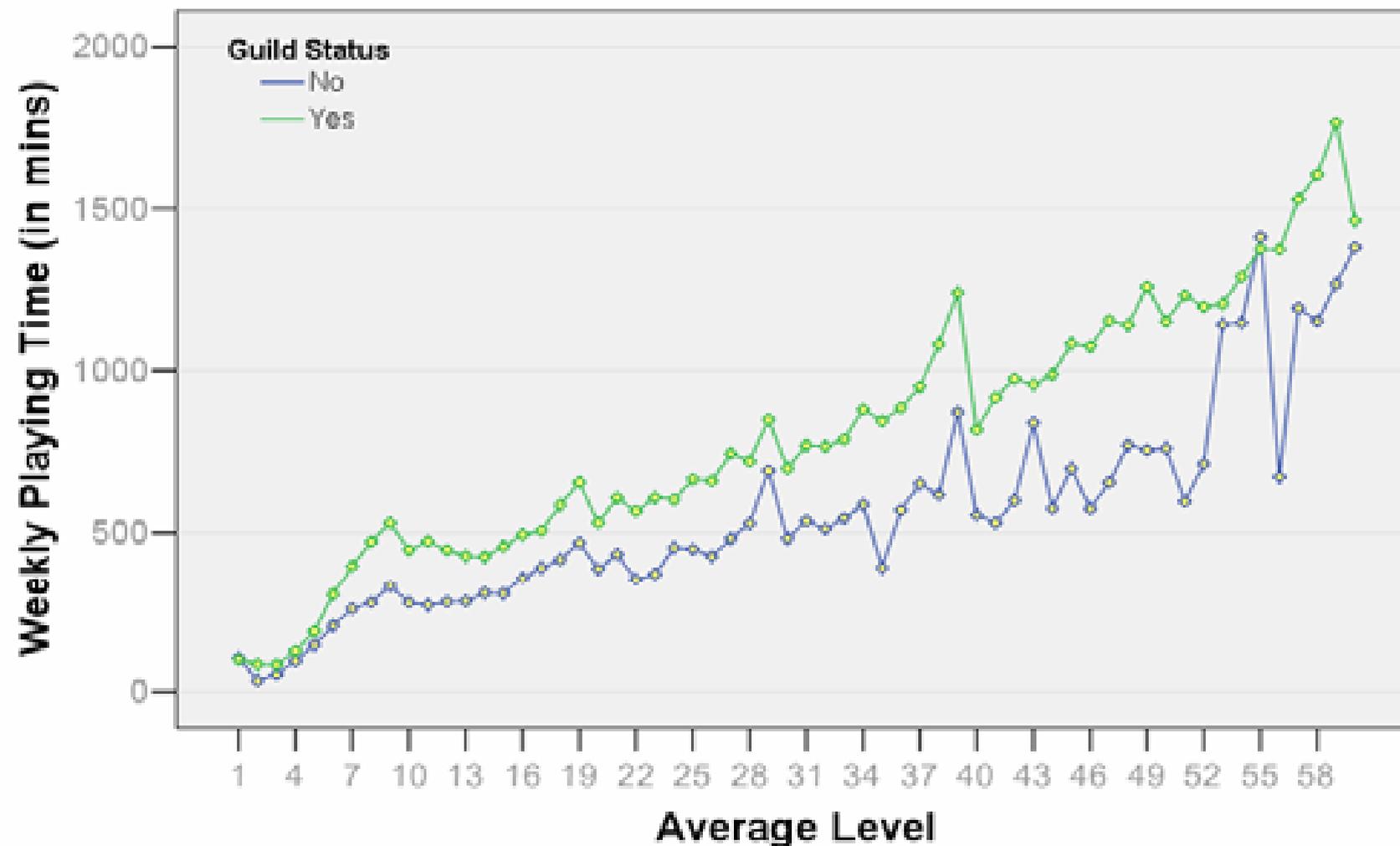


Figure 7 - Guild membership and playing time, by level

Guild size

- Guilds tend to be small:
 - Average size 14.5
- Guild size tends to stay constant over time
- **BUT:**
 - Player churn is significant, and old players regularly leave and are replaced by new ones.
 - Guilds themselves churn regularly, 25% of them disappear each month.

Guild Networks

- The social networks in guilds usually have a committed core, and several peripheral players:

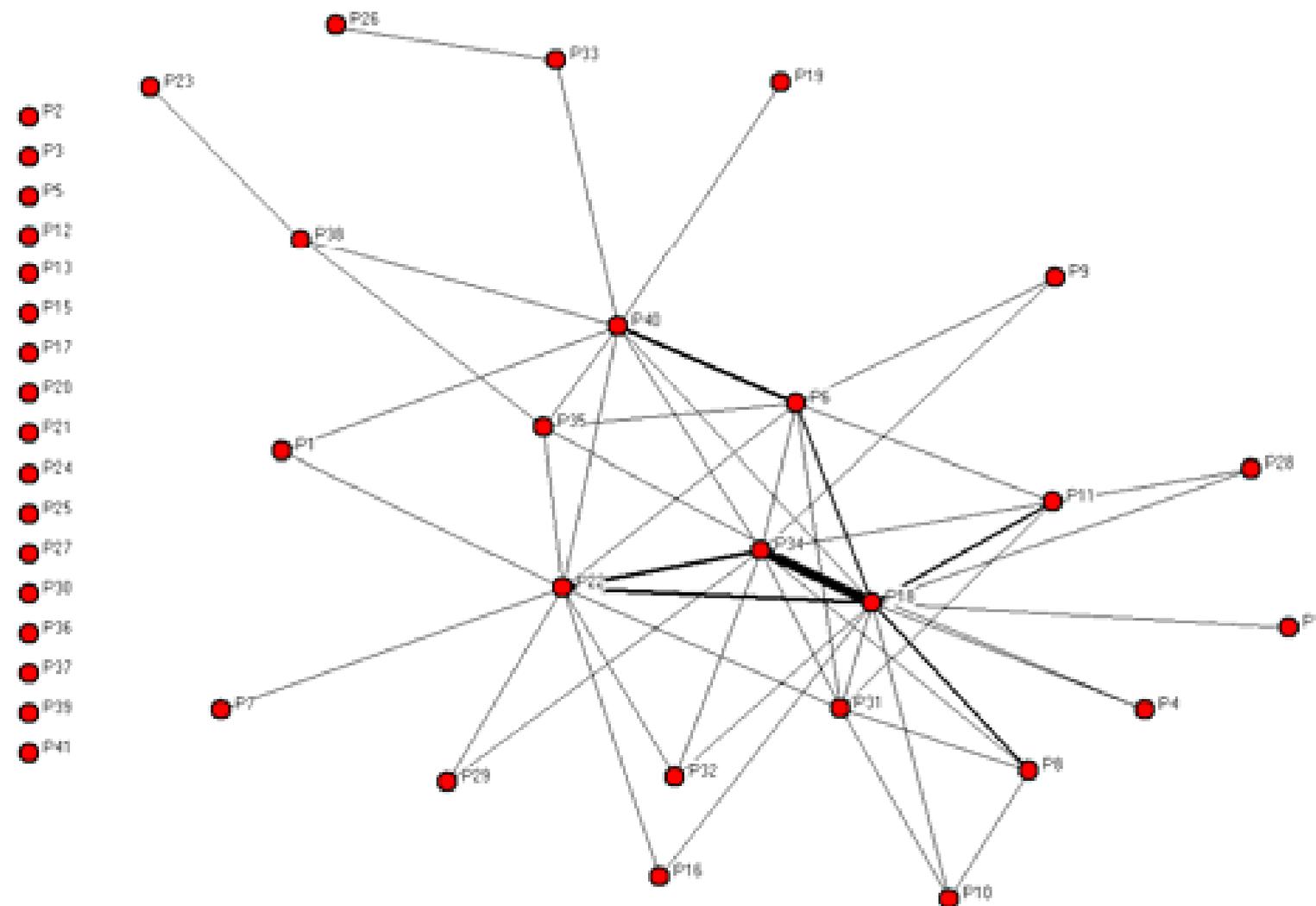


Figure 8 – Co-location network in a medium-sized guild

Guild Networks

- The social networks in guilds usually have a committed core, and several peripheral players:

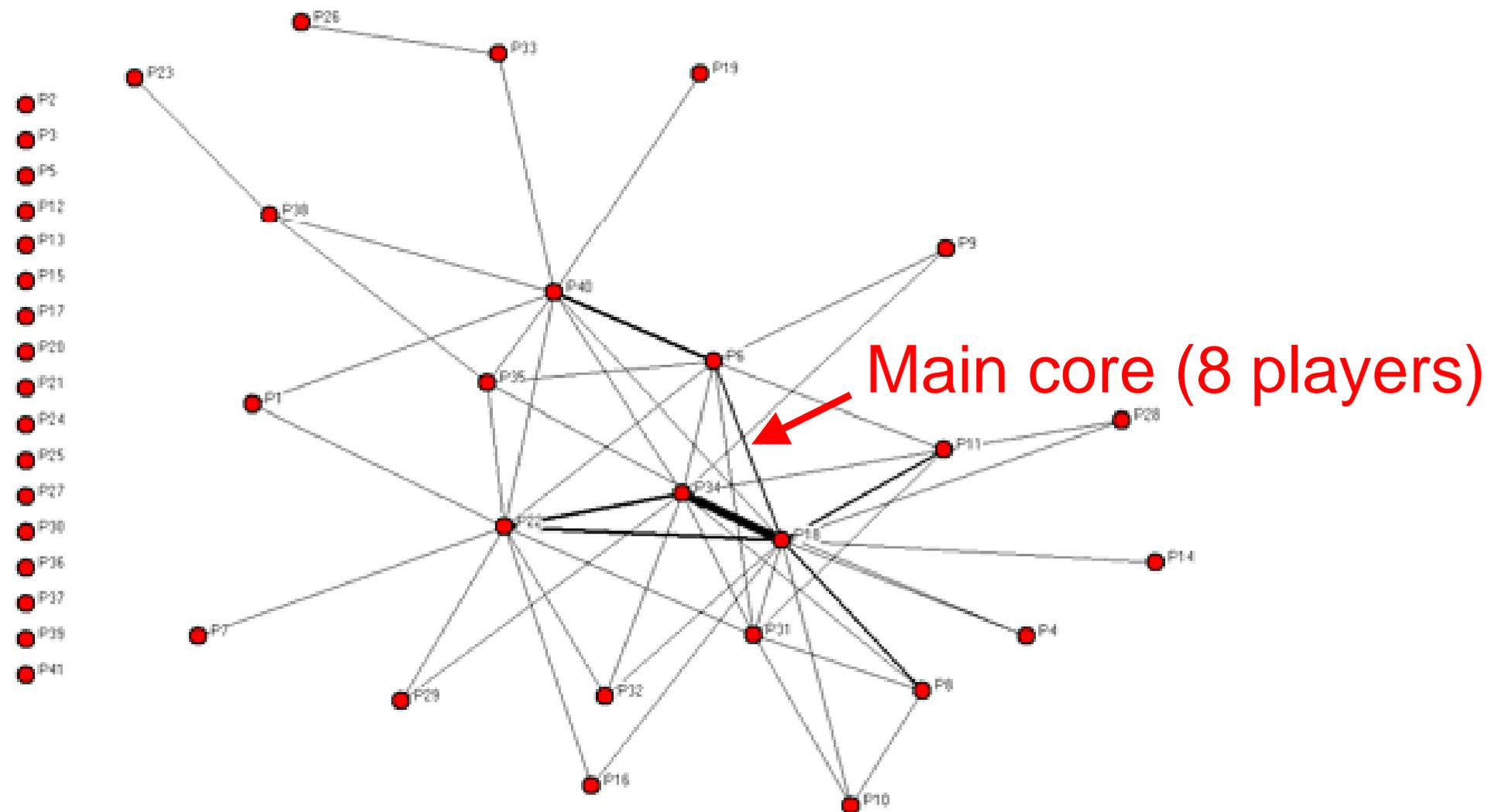


Figure 8 – Co-location network in a medium-sized guild

Guild Networks

- The social networks in guilds usually have a committed core, and several peripheral players:

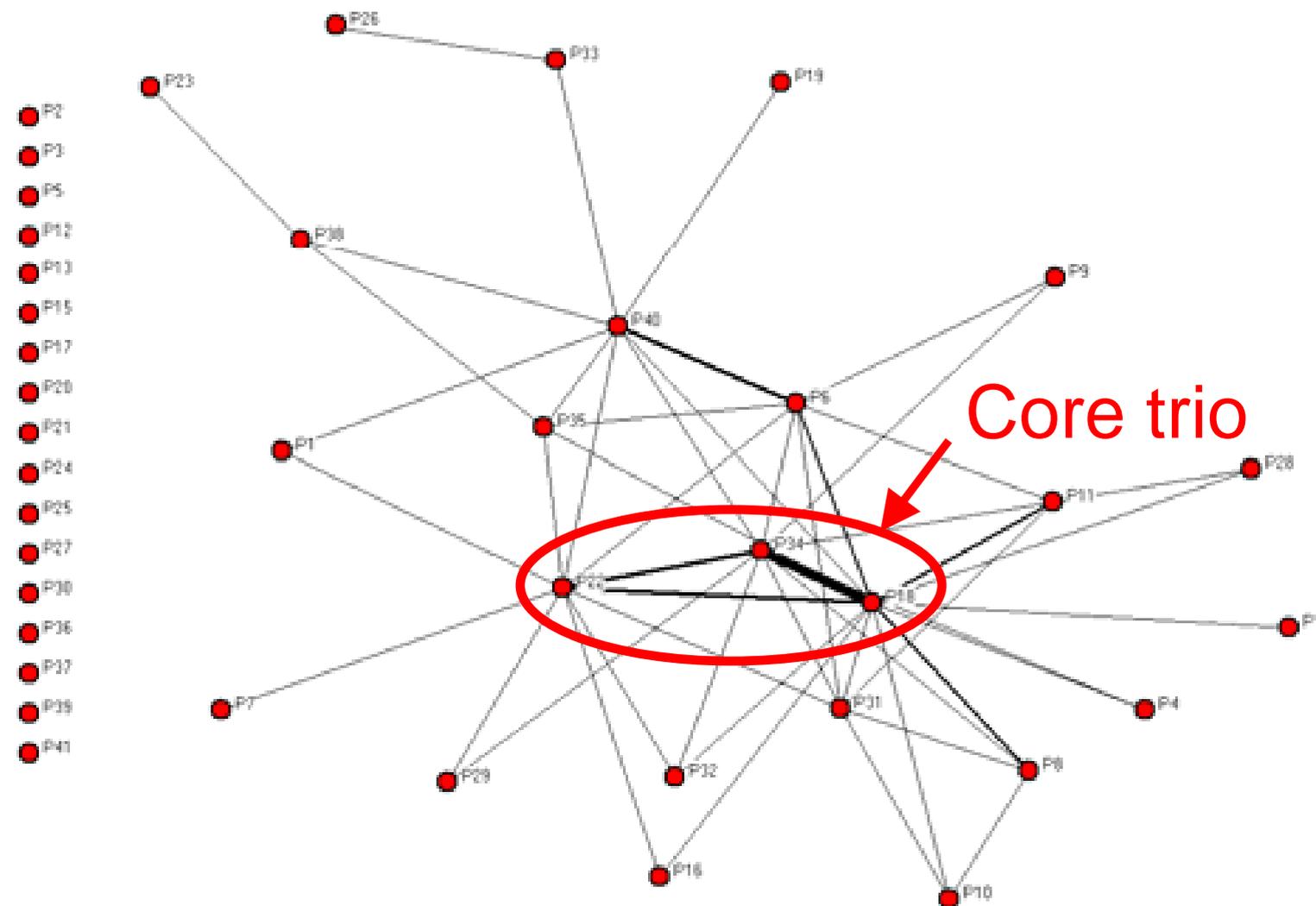


Figure 8 – Co-location network in a medium-sized guild

WoW discussion

- Game design (playability) is still a big factor in success of the game.
- WoW was designed to be accessible to many players, and the leveling structure is very clean.
- Group play increased with level, but group play was less efficient for rapid leveling.
- Guilds are small, churn regularly, and players turn over to keep the guild at its working size.
- They often have a committed core and periphery.
- Groups and guilds are formed from need, but players still play “alone together”.

Alone together

Why do players enjoy individual play in a public arena?

The answer seems to be:

- Audience
- Social presence
- Spectacle

Design Implications?

Design Implications?

Are game collaborators more like friends or weak ties?

Share personal information or just game-related stuff?

Keep a detailed archive of your collaborations over time?

Would you hire someone you quested with?

Wikipedia

Is it a “wisdom of crowds” phenomenon, or a volunteer elite?

In 2004, the top 2.5% of users contributed half the edits.

There were about 1000 “Admins” in Wikipedia in 2006.

Wikipedia

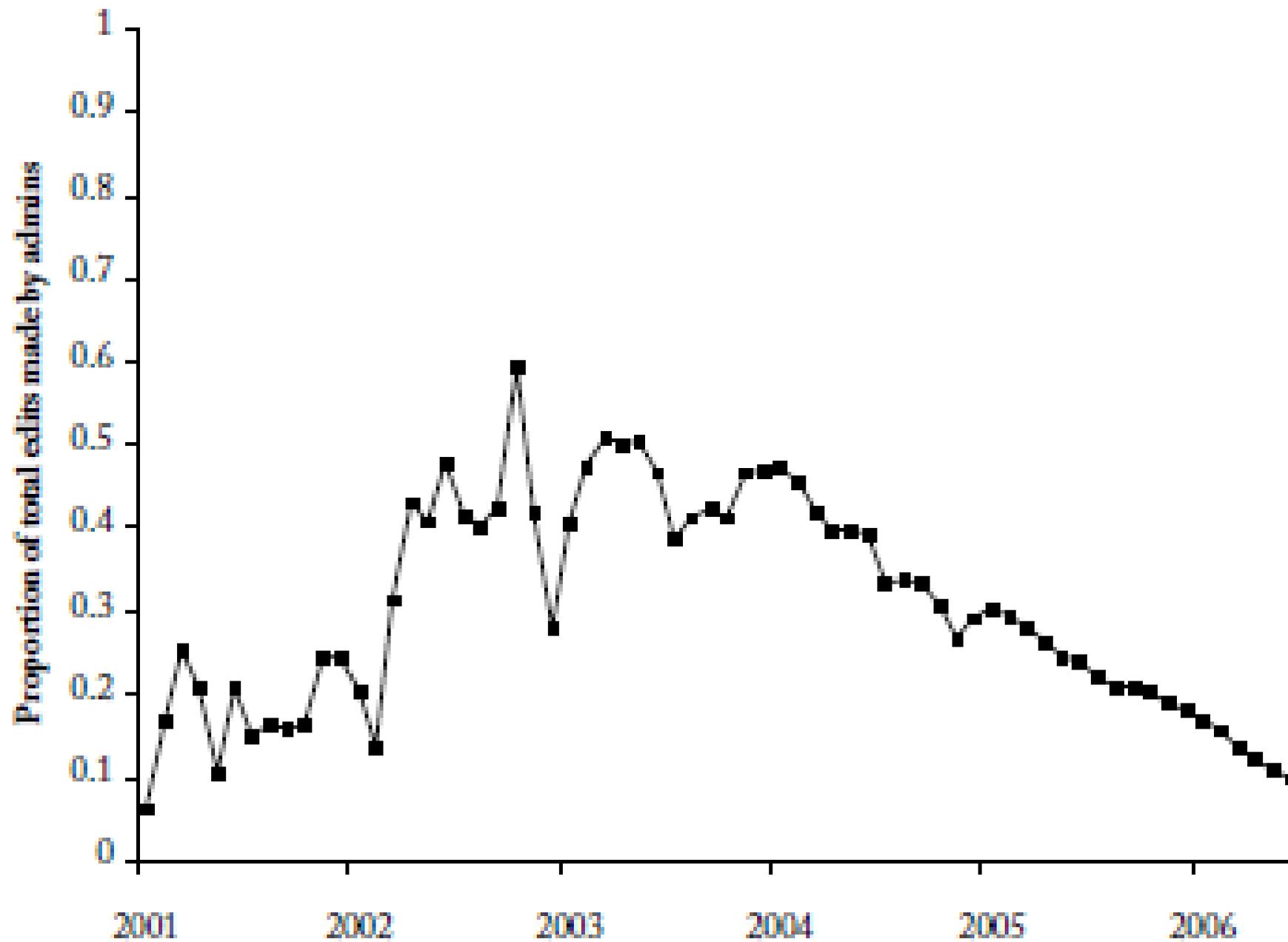


Figure 1. Percentage of total edits made by admins.

Wikipedia

Edits by groups of users

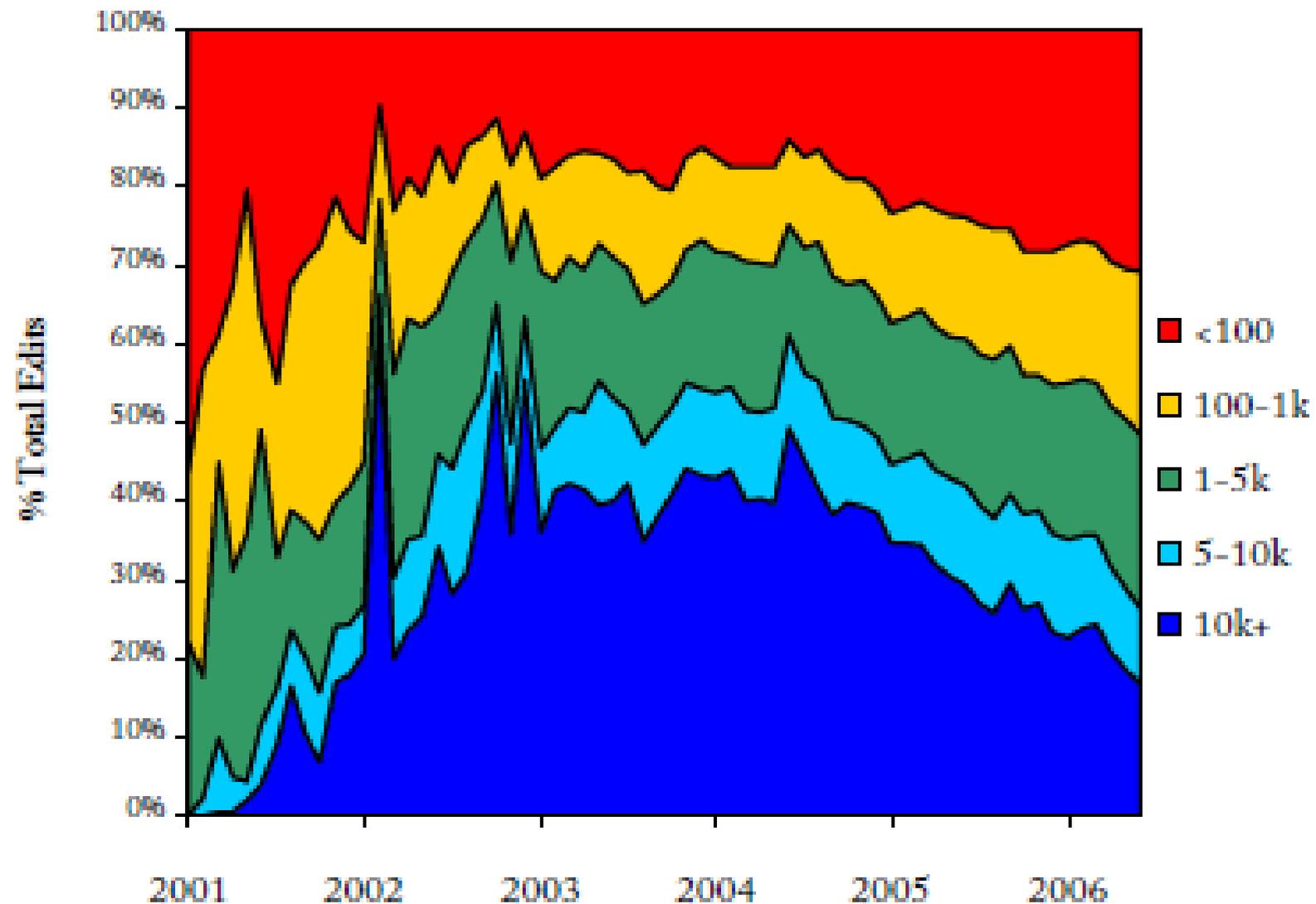


Figure 4. Percentage of total edits made by users with differing editing levels.

Wikipedia

Growth of population groups

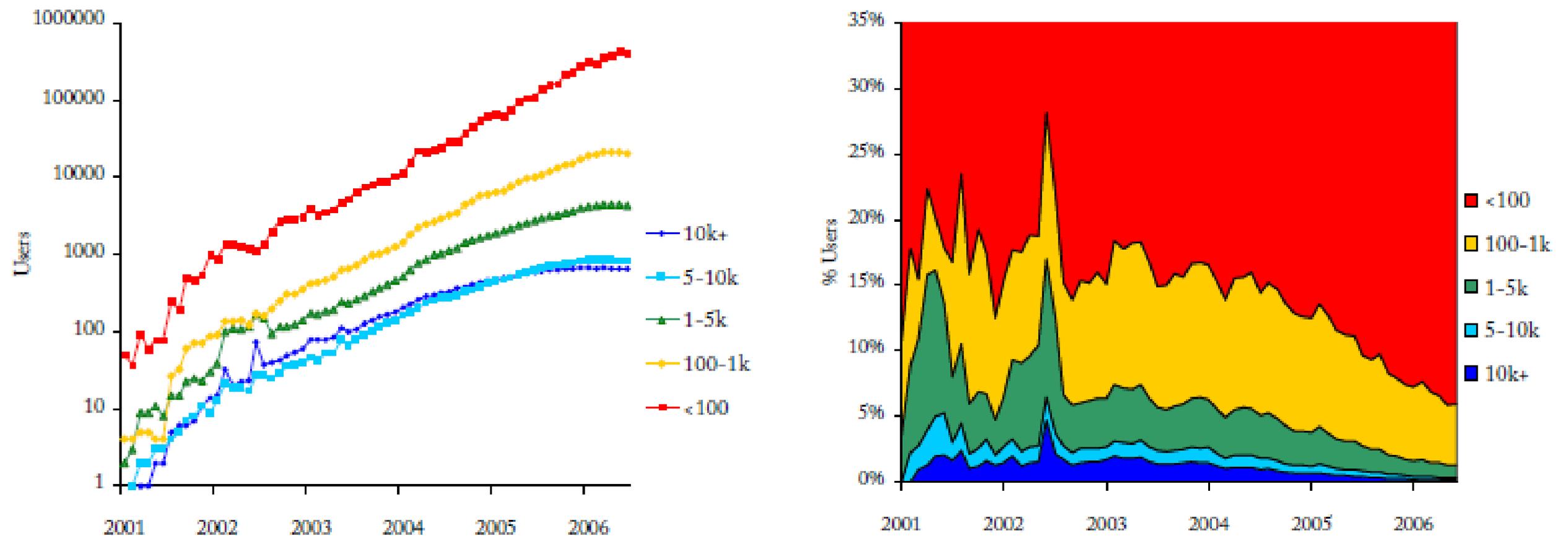


Figure 8. Percentage of users in each user group over time.

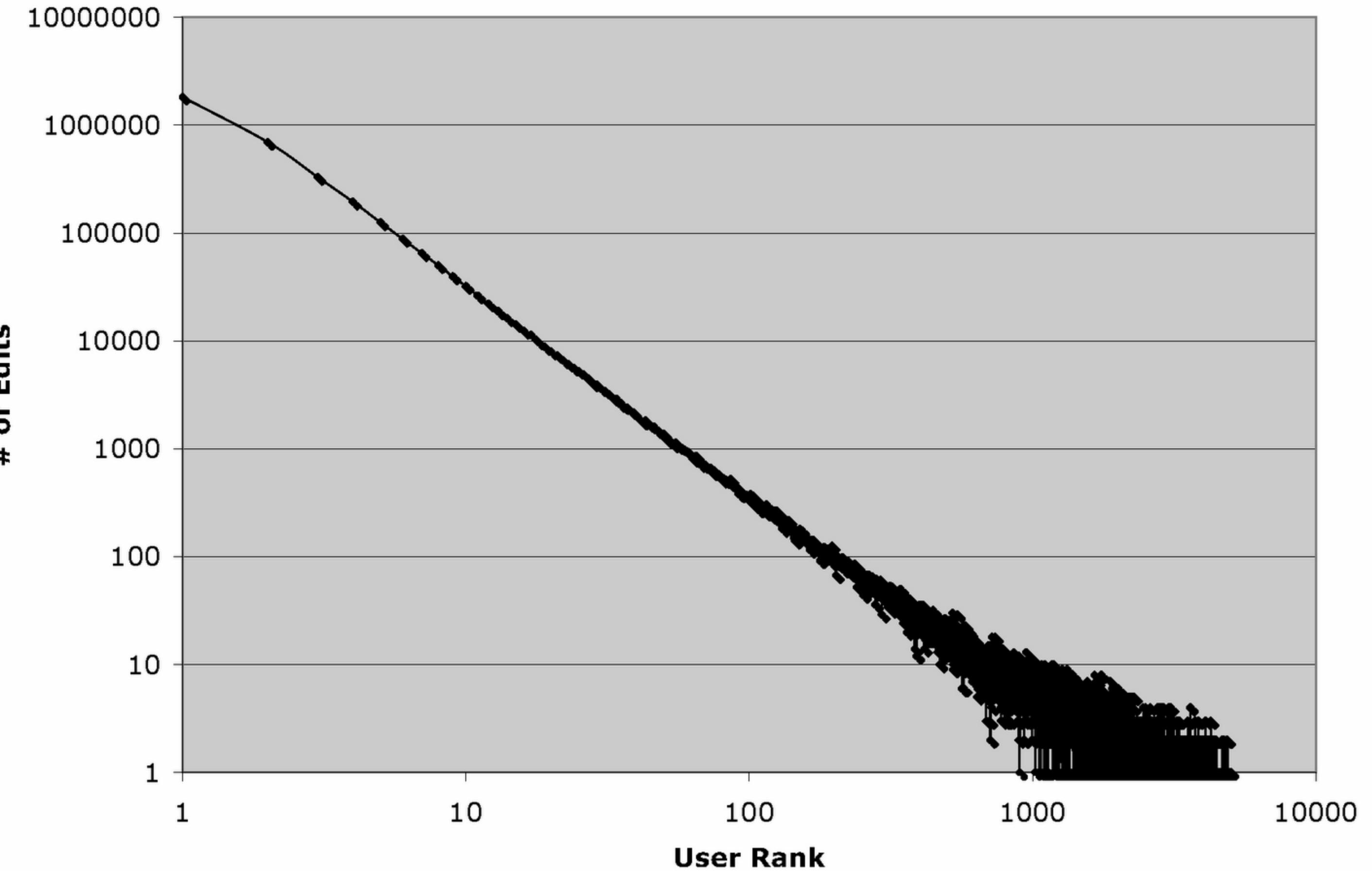
Wikipedia

The small contributor community has grown much faster than the elite group.

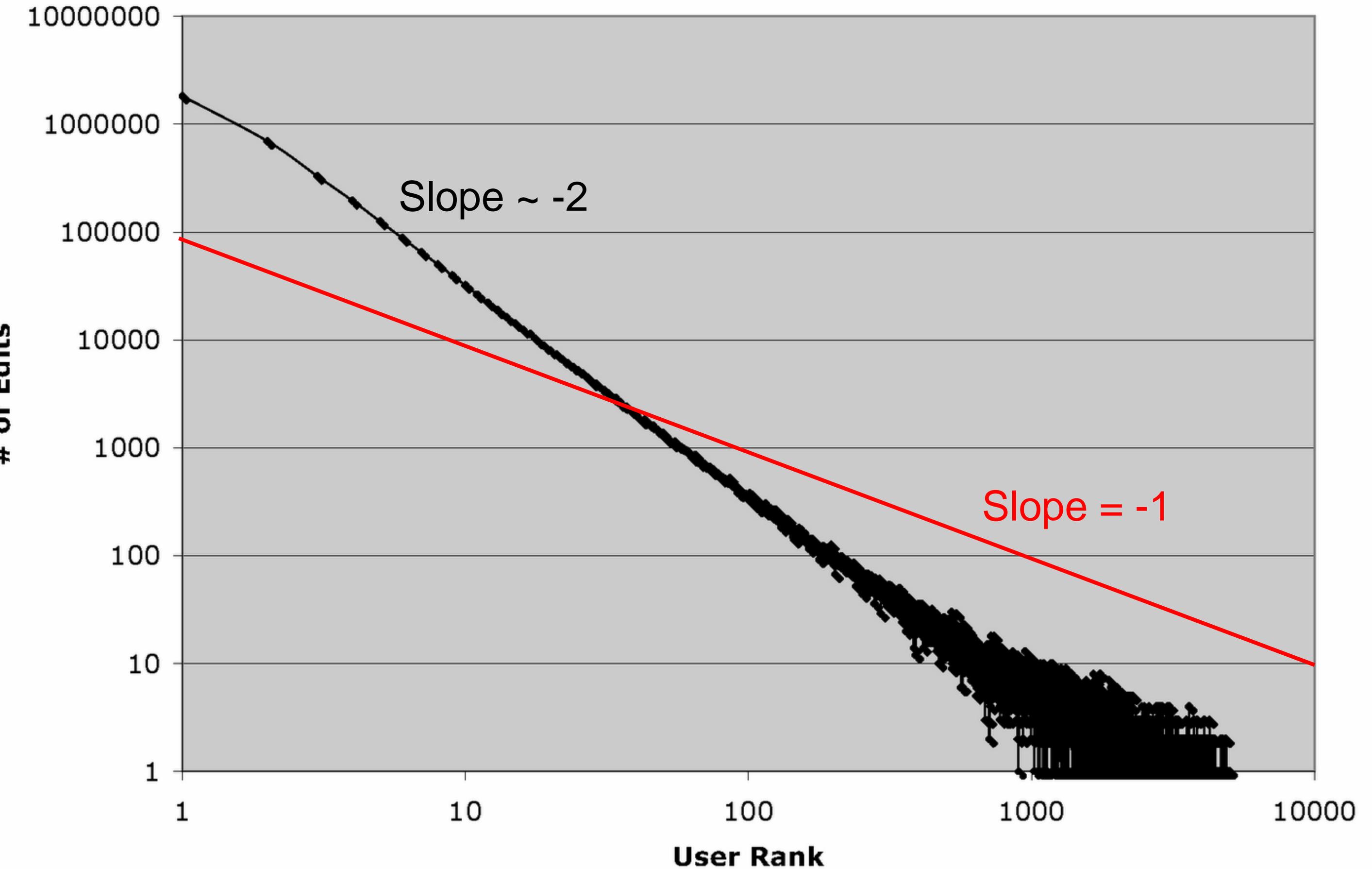
By far the largest group of contributors do less than 100 total edits, and this group was also the fastest growing.

However, contributions follow a power law with exponent around -2. Most of the contributions still come from active users (who are not admins).

Power Law graph of user participation in Wikipedia



Power Law graph of user participation in Wikipedia



Wikipedia

Why do users contribute (Bruckman et al.)?:

- Authors are like scientists: they like to learn about the world, and write about it.
- Authors are also strongly motivated by perceived status.
- Although there are no author citations, active users are aware of the primary authors of many documents. They take pride in their best articles and are aware of the best articles of others.

Design Implications?

Design Implications?

Make a more explicit credit system, but maybe only visible to contributors.

Keep a viewable archive or resume for each contributor.

Include citation indices, similar to Google Scholar (i.e. keep track of how many other articles cite each article).

Social Media and Social Change

Social media filled a multitude of roles in “Arab Spring” protests:
Alternative news: 75% of tweets from Egypt and Libya were read from outside the arab world.



Social Media for News

Social media proved to be unique conduits for real-time news.

Traditional news requires confirmation from independent sources.

Social media provide many independent accounts, often with video, in a fraction of the time.



Social Media

Blogs by individuals became a major source of influence.

Beginning in Tunisia, news spread across borders. Social media with remote servers, multiple providers etc., were particularly resilient to being shut down.



Lena Ben Mhenni of Tunisia

Social Media and Mobilization

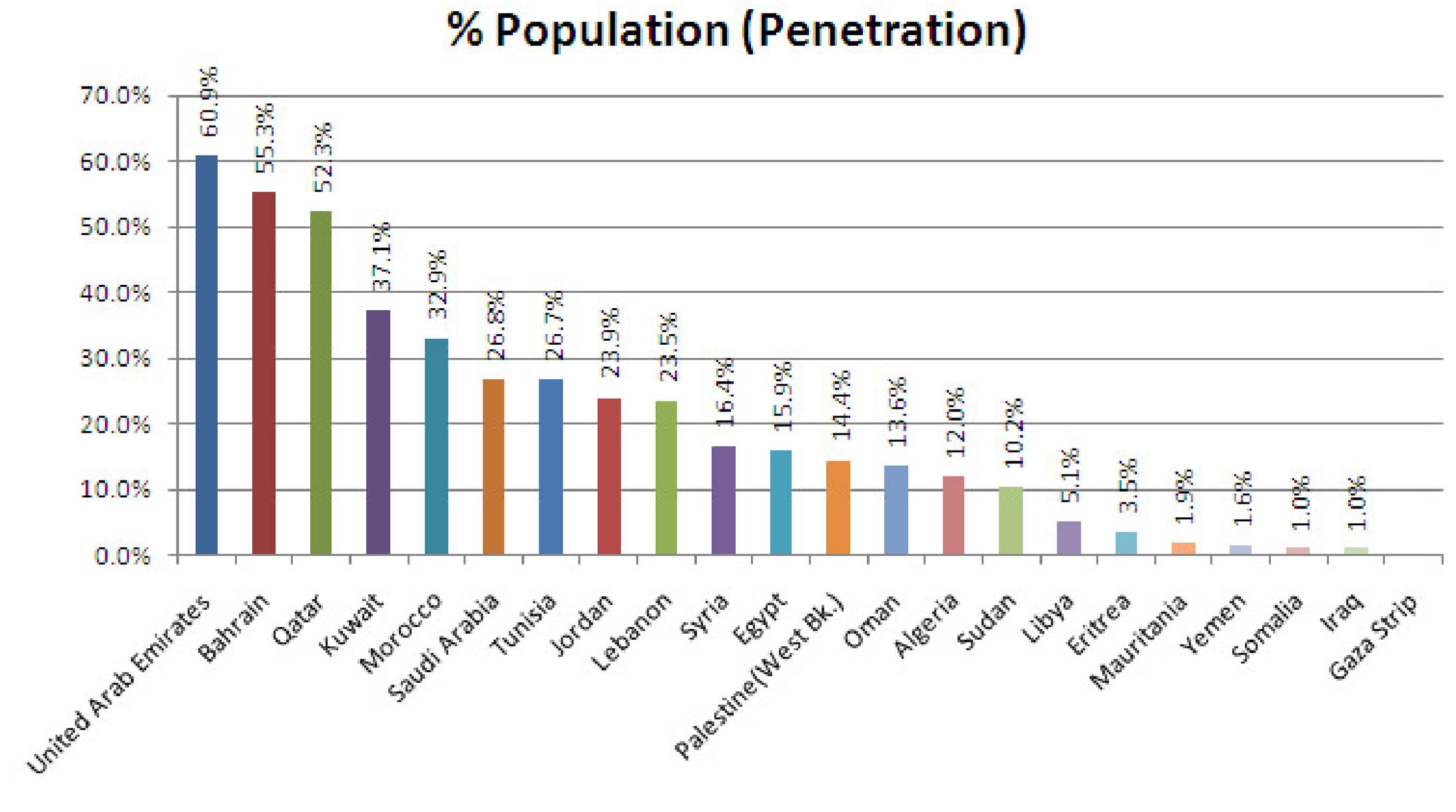
Social media activity spiked before major gatherings, indicating they were an important technology for organizing and coordinating.

Movements were able to grow without formal organization. i.e. there was no central “resistance” with an organizational hierarchy.



Social Media and Access

How much does internet access matter (2009 numbers) ?



Design Implications?

Design Implications?

Facilitate rapid forwarding across media, to many recipients.

Support a variety of publish/subscribe models, especially distributed (a la Bittorrent).

Better privacy/obfuscation tools?

Social Media and Freedom

Countries with closed (National) networks:

- Iran
- North Korea
- Myanmar
- Cuba

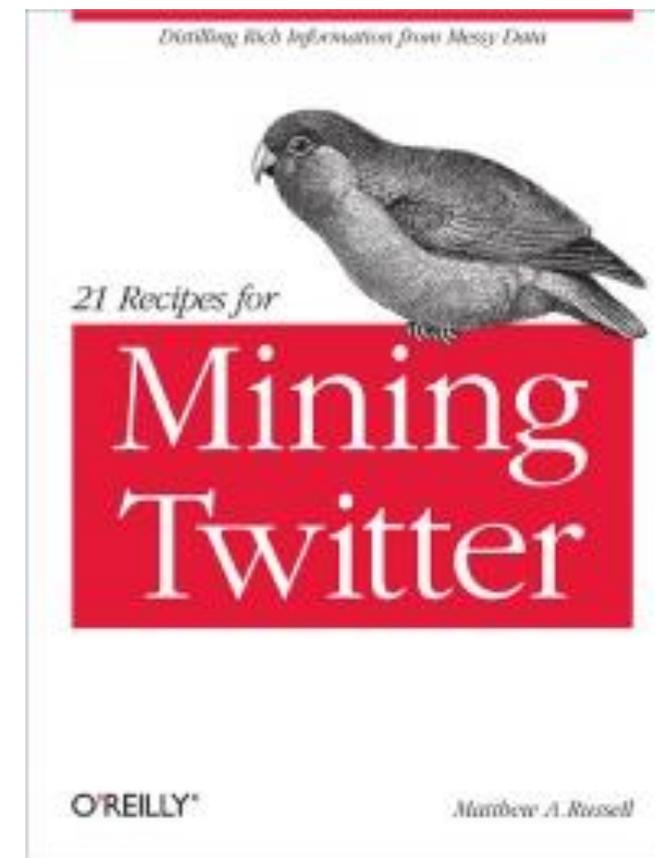
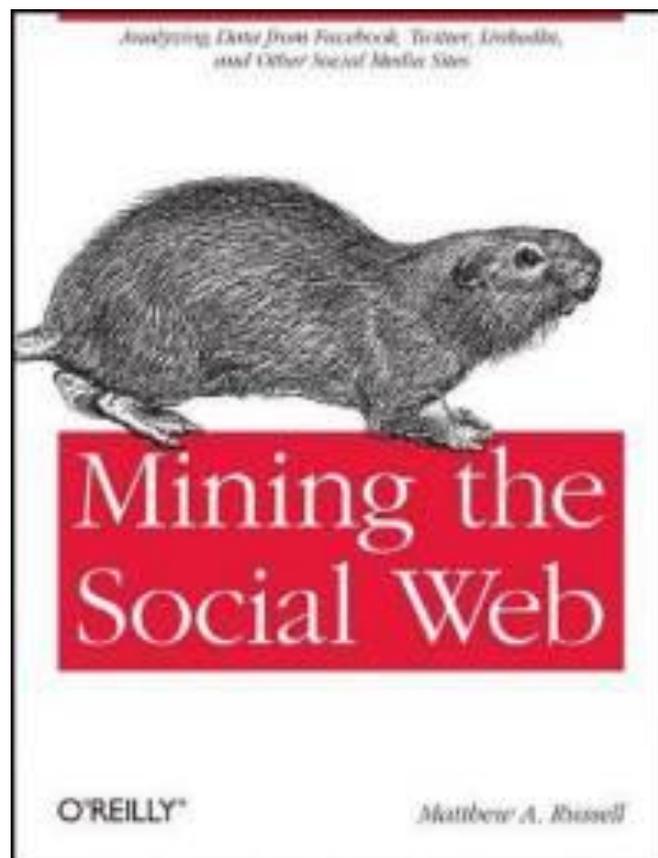
These closed networks have extensive censorship and monitoring in place. But, there are some “back-doors” for information:

- About 30% of Iranians watch Satellite TV.
- Large numbers of bloggers in Iran and Myanmar, and many blogging from outside those countries.

Social Media and Freedom

But are social media instruments of freedom or tools for oppression?
Are the large blogger communities in some countries deliberately tolerated for surveillance purposes ?

Social Media Mining



Social Media Mining

Localizing natural disasters from messaging rate and density. Can be used to estimate intensity and epicenter of earthquakes.



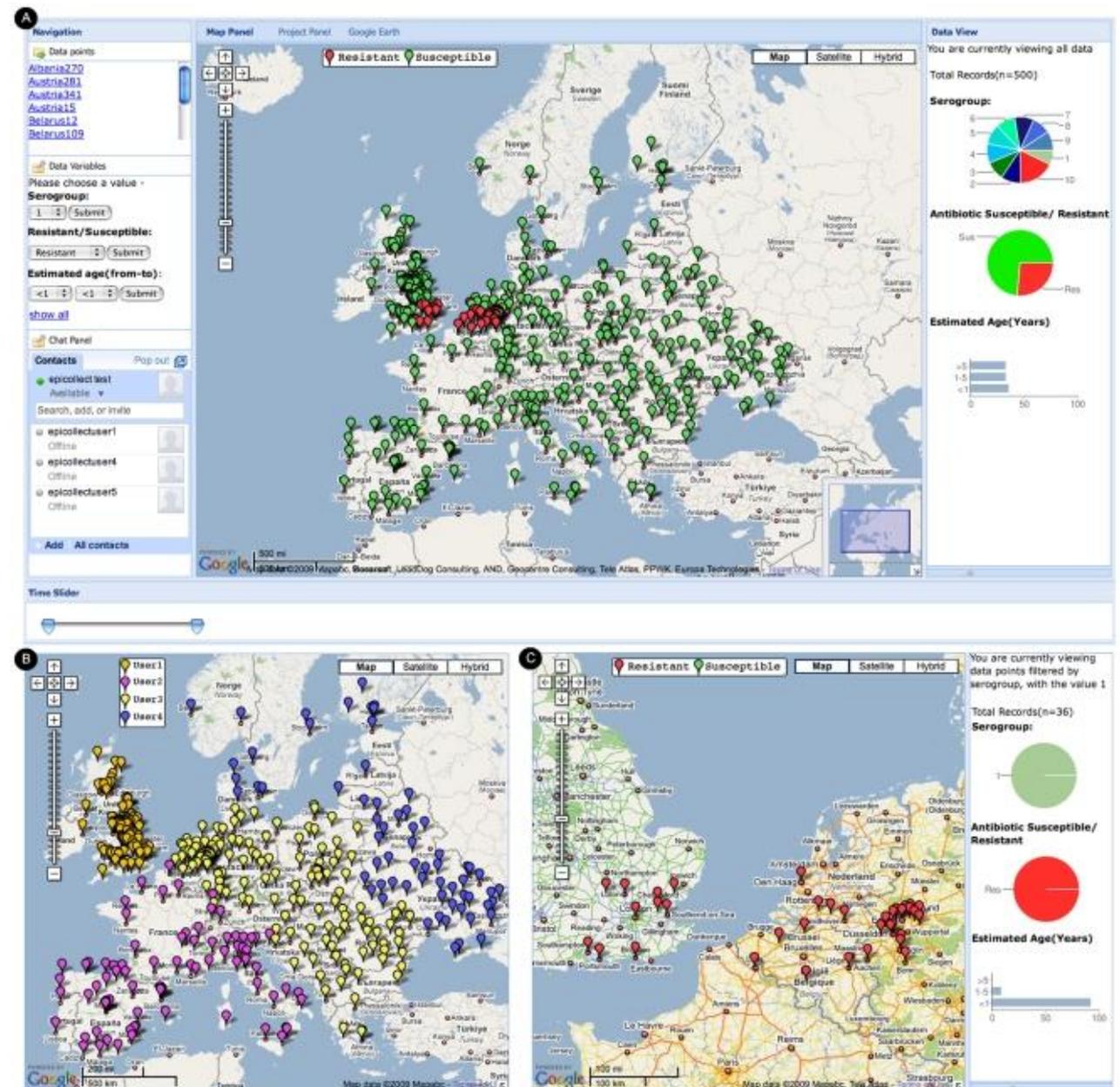
See also Cal's warning service: <http://warnme.berkeley.edu/>

Social Media Mining

Epidemiology:

Subjects mobility and social contacts are heavily affected by illness, e.g. flu, malaria etc.

Tracking mobility, proximity and messaging activity can generate maps of disease progression.



Social Media Mining

Social media generate huge volumes of public or semi-public information. E.g. about half of all tweets are public.

Twitter manages about 10 million public tweets/hour, 10's of terabytes per year.

Such data support all kinds of analysis. Two in particular have been very active:

- Mood analysis: how do people feel generally ?
- Sentiment analysis: what do people think about X ?

Social Media Mining

Sentiment keywords. The ANEW corpus (Affective Norms for English Words). Each word is tagged with a numerical score, and then scores are added up to generate a document score.

Value is “valence”, large equates to “happy”, small values to “sad”

Lyrics for
Michael Jackson's Billie Jean

“She was more like a beauty queen
from a movie scene.

⋮

And mother always told me,
be careful who you love.

And be careful of what you do
'cause the lie becomes the truth.

Billie Jean is not my lover,
She's just a girl who claims
that I am the one.

⋮



ANEW words	v_k	f_k
$k=1.$ love	8.72	1
2. mother	8.39	1
3. baby	8.22	3
4. beauty	7.82	1
5. truth	7.80	1
6. people	7.33	2
7. strong	7.11	1
8. young	6.89	2
9. girl	6.87	4
10. movie	6.86	1
11. perfume	6.76	1
12. queen	6.44	1
13. name	5.55	1
14. lie	2.79	1

$$v_{\text{text}} = \frac{\sum_k v_k f_k}{\sum_k f_k}$$

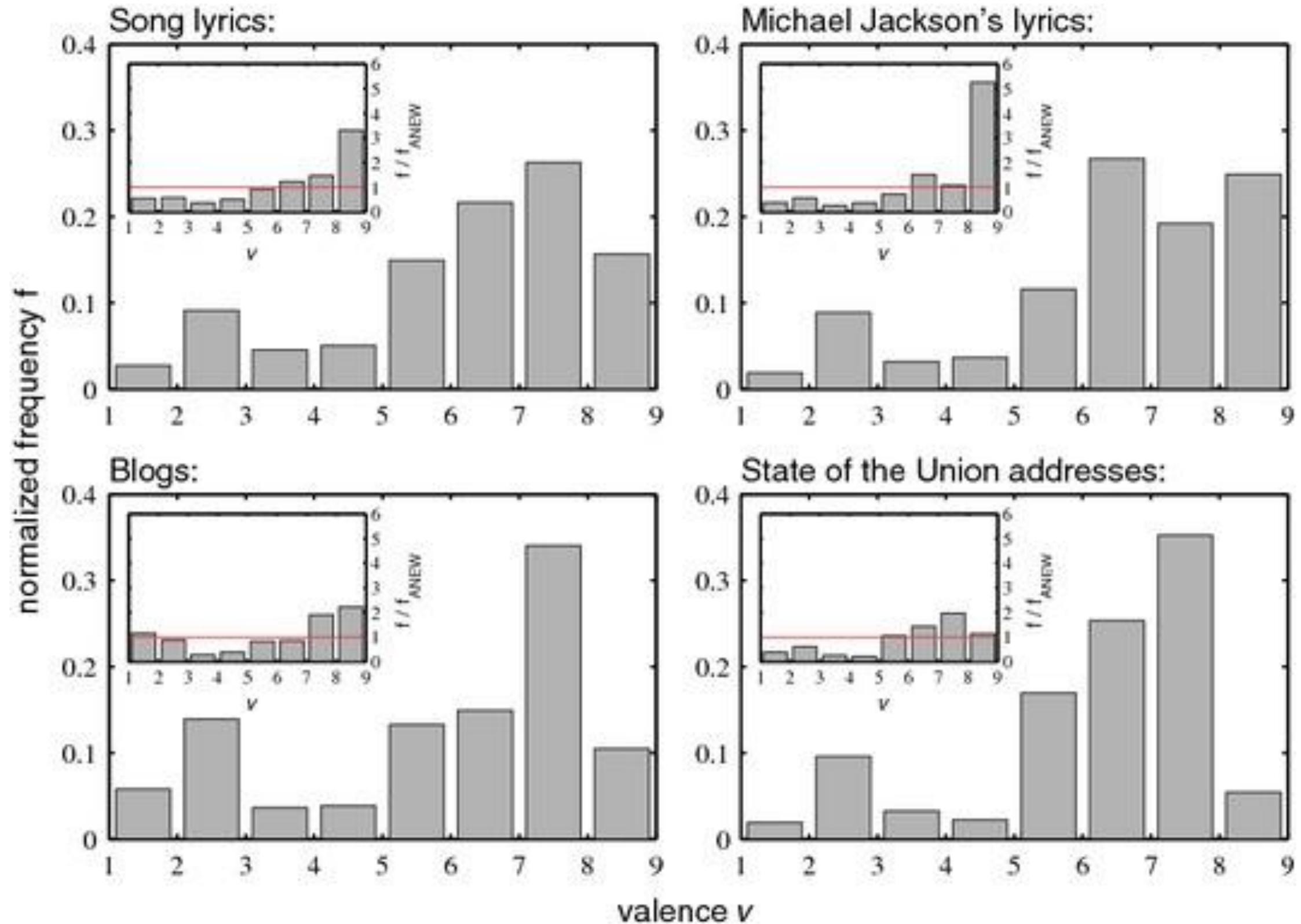


$$\Rightarrow v_{\text{Billie Jean}} = 7.1$$

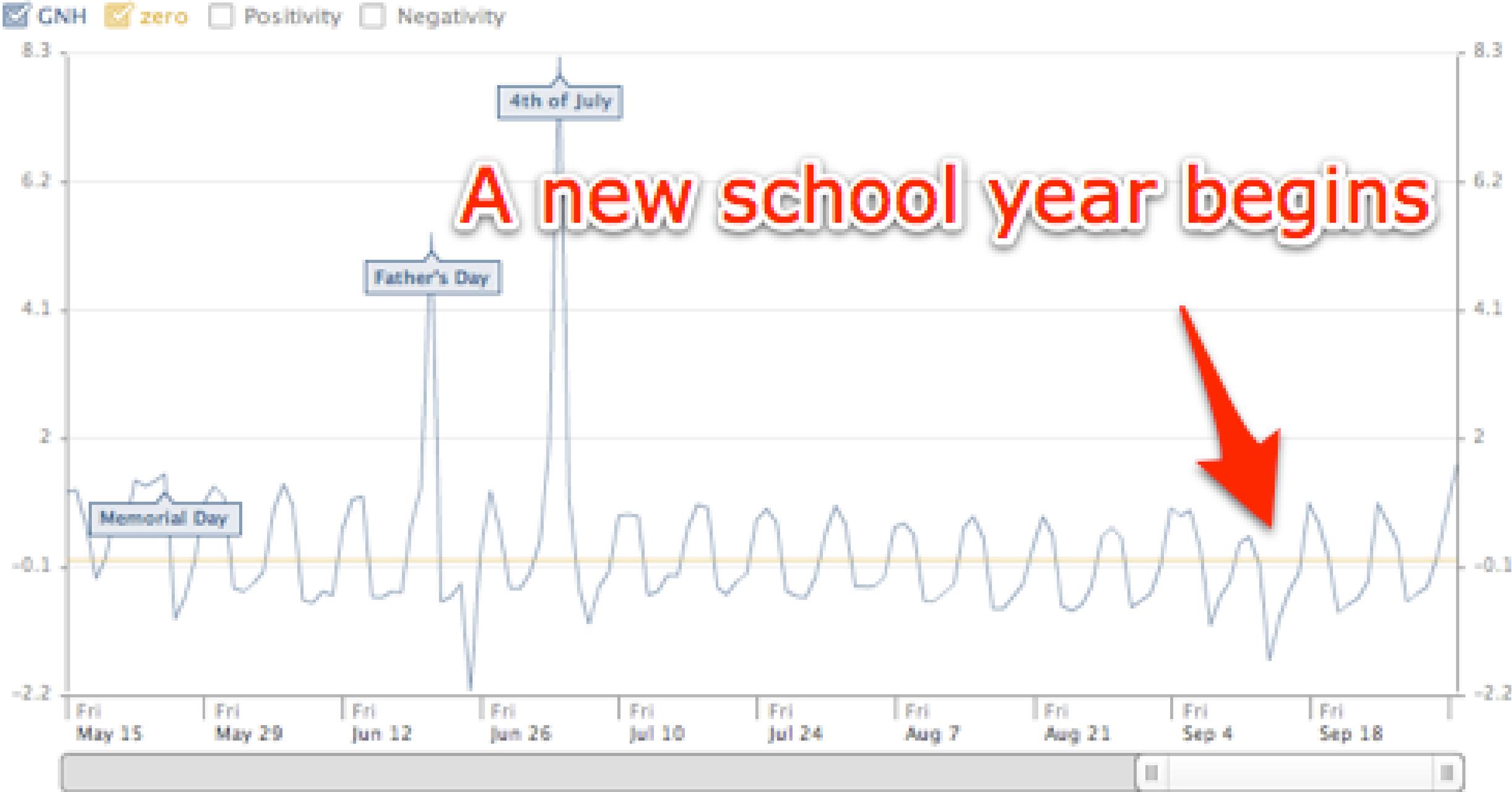
$$v_{\text{Thriller}} = 6.3$$

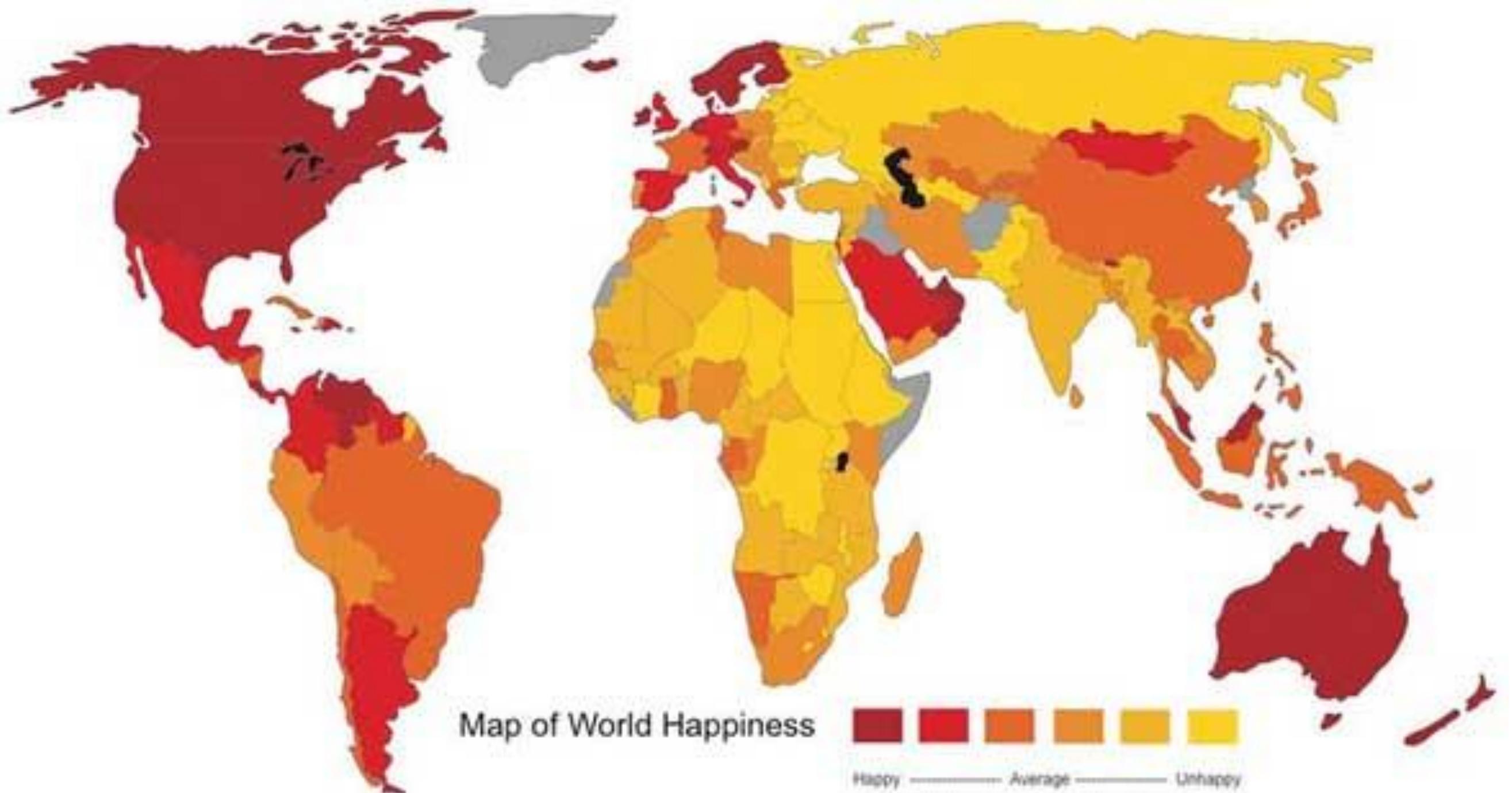
$$v_{\text{Michael Jackson}} = 6.4$$

Social Media Mining



Gross National Happiness





Sentiment Analysis

Key Dimensions:

Subjectivity

- subjective (*genius*), objective/factual (*hypertext markup language*)

Polarity

- positive (*love*), neutral (*fish*), mixed (*love-hate*), balanced

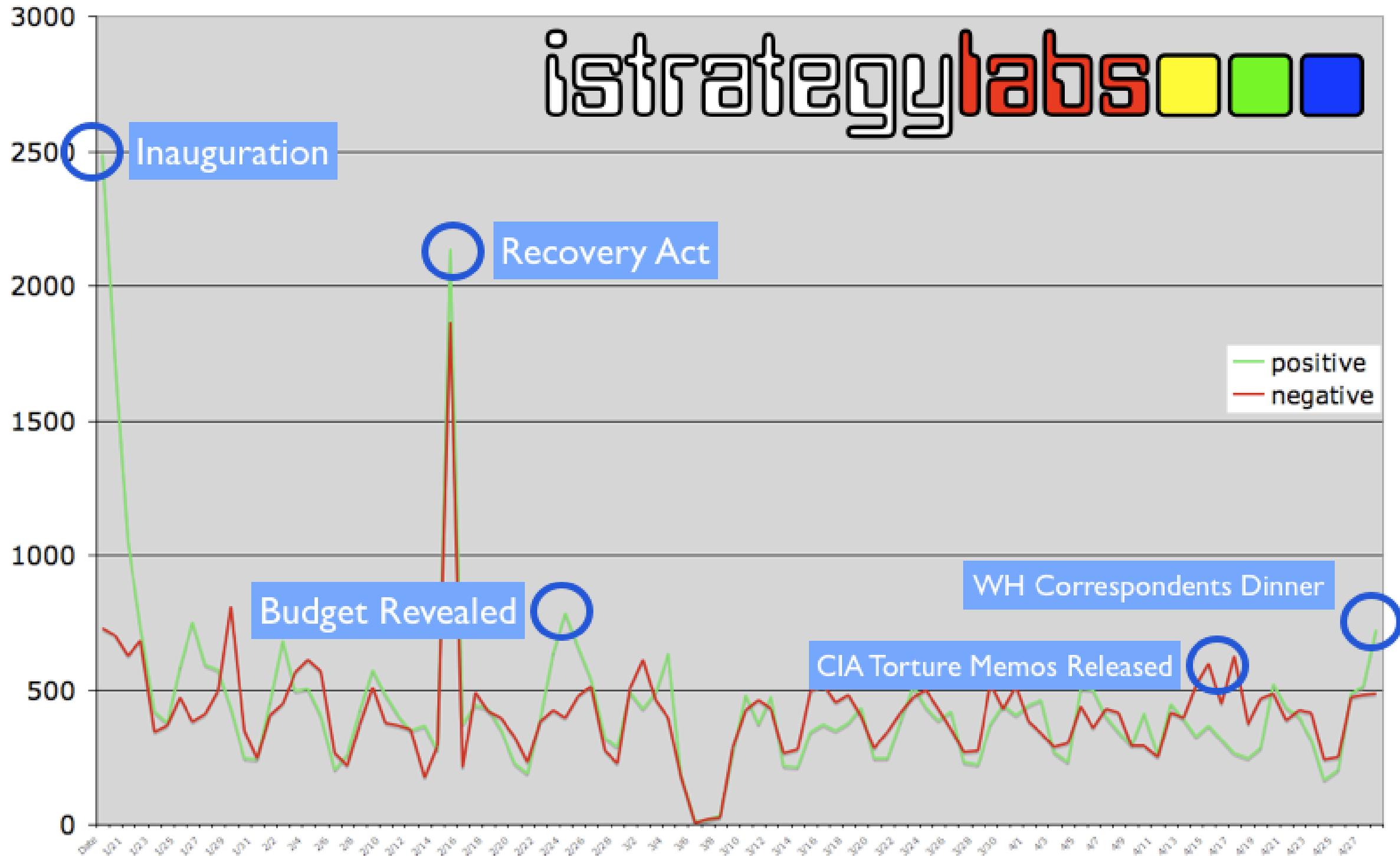
Strength

- weak (*nice*), strong (*extremely nice*)

Affect

- key universal categories (anger, disgust, fear, joy, sadness, surprise, ...)

Sentiment Analysis



Sentiment Analysis

Top Common Terms ? Lib			Top Common Terms ? Lab			Top Common Terms ? Con		
Term	Relevance	Freq.	Term	Relevance	Freq.	Term	Relevance	Freq.
payer		122	sockpuppet		73	payer		164
labour page		55	scrounger		113	wetfish		72
earner		129	payer		62	days.		46
days.		45	1980s		34	scrounger		74
emergency budget		44	days.		34	tax payers money		36
bank levy		44	spending cuts		55	bailout		21
bailout		35	earner		63	benifit		34
scrounger		86	sockpuppets		30	labour page		32
lib dem policy		38	wing media		29	backside		55
10k		38	bailout		19			
income tax threshold		36	defecit		26	earner		52
defecit		35	ge2010		25	had'nt		24
etc.		35	no-one		50	elses		23
spending cuts		55	backside		41	etc.		23
no-one		64	shyster		23	werent		22
by-election		19	hundreds of		22	insult		161
1980s		27	thousands			liebour supporters		21
shyster		27	dip recession		32	part time job		21
elses		26	insult		121	no-one		42
hundreds of		26	someone squeak		19	defence cuts		20
thousands			eejits		19	tosser		55
lib dem supporter		23	etc.		18	arse		145
millions of people		23	peoples lives		18	sh-one-t		19
tax payers money		23	avoider		21	benefits		28
peoples lives		22	millions of people		17	spending cuts		28
			billions of pounds		17			

Latent Sentiment Analysis

Term	Following term	Forward count	Backward count	χ^2 statistic
obama	administration	1031	413	132.2452
obama	hes	728	322	78.4933
obama	wants	620	273	67.4183
obama	office	844	442	62.8320
obama	doing	714	350	62.2632
obama	elected	618	307	52.2816
obama	born	328	120	48.2857
obama	socialist	706	385	47.2232
obama	himself	435	200	43.4843
obama	done	723	412	42.6084
obama	muslim	319	141	34.4391
obama	policies	631	377	32.0020
obama	plan	537	320	27.4732
obama	took	408	222	27.4571
obama	promised	221	97	24.1761
obama	agenda	371	206	23.5919
obama	supporters	261	129	22.3385
obama	pelosi	274	144	20.2153
obama	marxist	190	90	17.8571
obama	birth	212	107	17.2806
obama	needs	284	164	16.0714

Latent Sentiment Analysis

Many postings show only indirect relationships between the “Obama” and “Muslim”:

based upon past actions such as a certain american president who was recently seen bowing in submission to one of the worlds largest sponsors of nutjobs like hassan the king of saudi arabia is not called pointless that is called speculation based upon empirical data

it says rather alot about obama who on the day this cowardly attack by this muslim terrorist happened comes out to allegedly address the nation about the attack and instead comes out and then takes that oppurtunity to talk about his own political agenda for over two minutes

it only seemsfair to call this terrorist an islamist terrorist eight months into office and prezident obama has the military and the cia afraid to report behavior inconsistant with a military officer obama bears ultimate responsibility for military personal afraid to speak out against radical muslim within thier own ranks

obama's homeland security department told us to worry about right wing extremists so they forgot to keep tabs on muslim extremists and that's why 13 soldiers are dead at fort hood obama should now be impeached

Latent Sentiment Analysis

Persuasive/Behavior Change interventions clearly need to be tailored to the individual. But what source do we use to figure out what actually influences people?

This is hard because self-report is very biased: user's always ascribe their own actions to their own choices rather than peer pressure. Data on peer influence show otherwise.

By analyzing statistical relations between posts and actions by users (see next slide), we want to uncover actual (conscious and unconscious) influences.

Social Media and Behavior Change

What we can do:

- Study very large groups of users and filter to find those who have successfully changed.
- Look at posting histories for those users for systematic influences through self-report.
- Look for peer influence between users who regularly @tweet to each other.
- Study **real-time influences** from mass media. i.e. there are about 200k tweets/minute, and substantial coherence with real-time events like network news, major sports events, popular TV shows.

Summary

Social media have become “almost everything we do”.

Social gaming is more of an individual sport.

“Wisdom of crowds” often still dominated by an elite, but which may be an informal one.

Social media can facilitate social change in important ways – but may also be used to stifle it.

Social media mining can provide many insights into: real-time events, trends in attitudes, and behavior change.