Asymmetric language synchronization in social interaction

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Conversational synchrony

People tend to adopt the behaviors of their interlocutors.

[Giles et al. '91, Chartrand & Bargh '99, inter alia]

Non-verbal	Posture [Condon and Ogston '67] Nodding [Hale and Burgoon '84]
"Non-semantic"	Pause length [Jaffe and Feldstein '70] Backchannels [White '84]
Language content	Words, esp. referring expressions [Brennan and Clark '96, Nenkova et al. '08, Stoyanchev and Stent '09,] Word classes [Niederhoffer and Pennebaker '02] Degree of self-disclosure [Derlenga et al. '73]

People tend to adopt the behaviors of their interlocutors...

...but participants can entrain to different degrees.

Asymmetric conversational synchrony
can tell us a lot about
user relationships.

Preview of Part I:
Pairwise adaptation and power

Who's in charge?

http://www.tvacres.com/images/robots_androids_marvin_movie.jpg
Art Lien / AFP/Getty Images

Preview of Part II: Adaptation to a group and long-term engagement

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Isn't all this obvious?

Paraphrasing Stuart Shieber:

Your goal is not to convince your audience that you are brilliant, but that your solution is trivial.

It takes a certain strength of character to take that as one's goal.

But if people think your findings are obvious, they must also believe that you are correct.

Echoes of Power:

Language effects & power differences in social interaction

Cristian Danescu-Niculescu-Mizil, Lillian Lee, Bo Pang, & Jon Kleinberg

WWW 2012

Art Lien / AFP/Getty Images

http://www.tvacres.com/images/robots_androids_marvin_movie.jpg

Example motivating applications

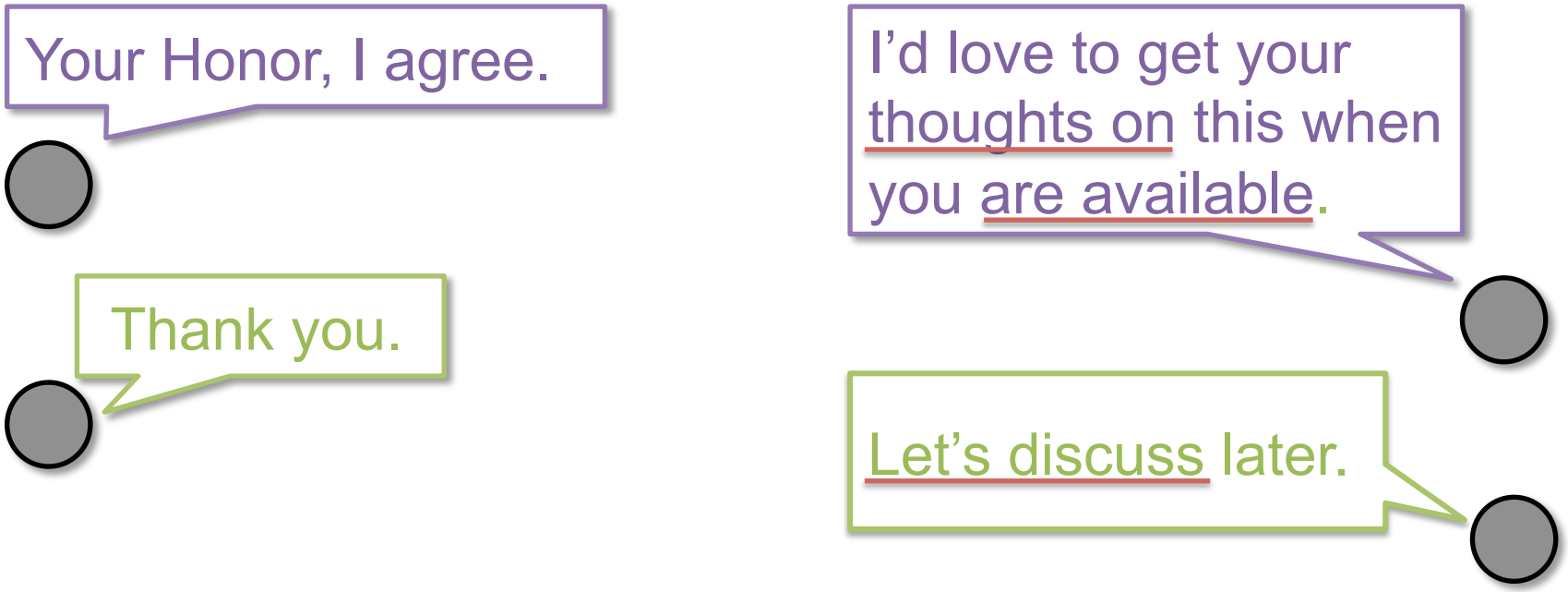
Proactive task-discussion management

- Steering conversations back on track

➔ Conversation facilitation systems

- Defusing imminent flame-wars
- Measuring engagement in MOOC settings
- e-government participation initiatives
  [Farina, Newhart, Cardie and Cosley '11]

Language reveals power: “easy” cases



[Gilbert 2012;
Diehl et al. 2007, Prabhakaran et al. 2012,
Scholand et al. 2010]

What about general (domain-independent) signals?

Who has the (conversational) lead?

Communicative behaviors are “patterned and coordinated, like a dance” [Niederhoffer and Pennebaker 2002]

Function-class matching: unconscious & frequent

[Niederhoffer and Pennebaker 2002]

Why word classes instead of words?

Function-class matching: unconscious & frequent
[Niederhoffer and Pennebaker 2002]

In contrast,
direct repetition is under the speaker's control,
and could just be choice of topic. ☹

couldn't find original credit; this version adapted from [illegible].blogspot.com/2012/02/images-of-parrots.html

Measuring immediate influence

How much does speaker x_1 immediately trigger x_2's use of function-word class c?

= how much does x_2 *coordinate* to x_1 on c?

Pr (x_2 uses c | x_1 uses c, x_2 immediately replies)

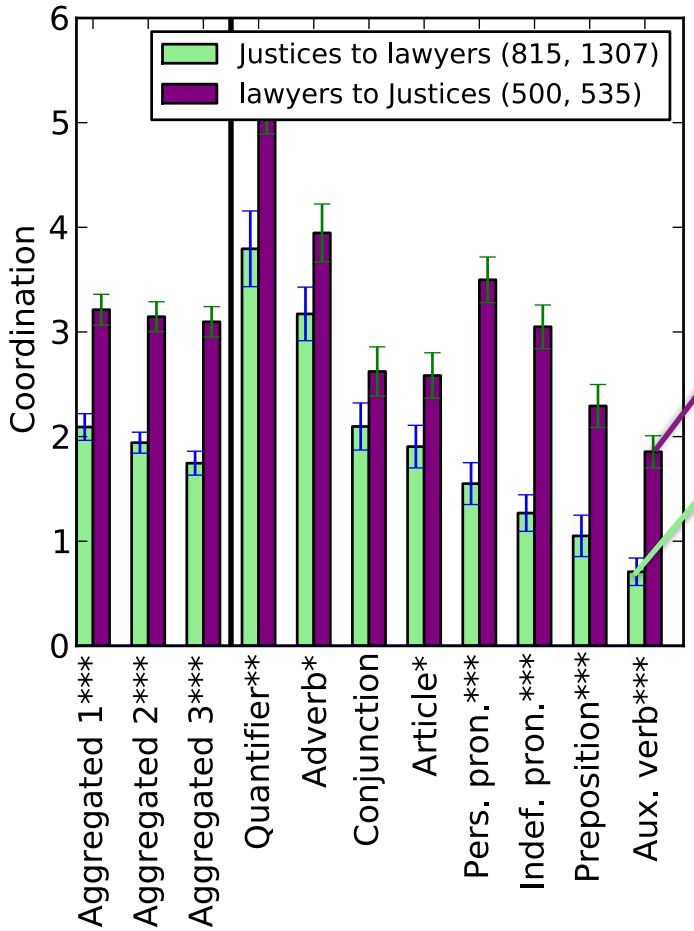
– Pr (x_2 uses c | x_2 immediately replies to x_1)

[Danescu-Niculescu-Mizil, Dumais, Gamon WWW 2011]

Reported as % (multiplied by 100) in the following.

Status in US Supreme Court transcripts

50,000 exchanges + metadata (download from my webpage)

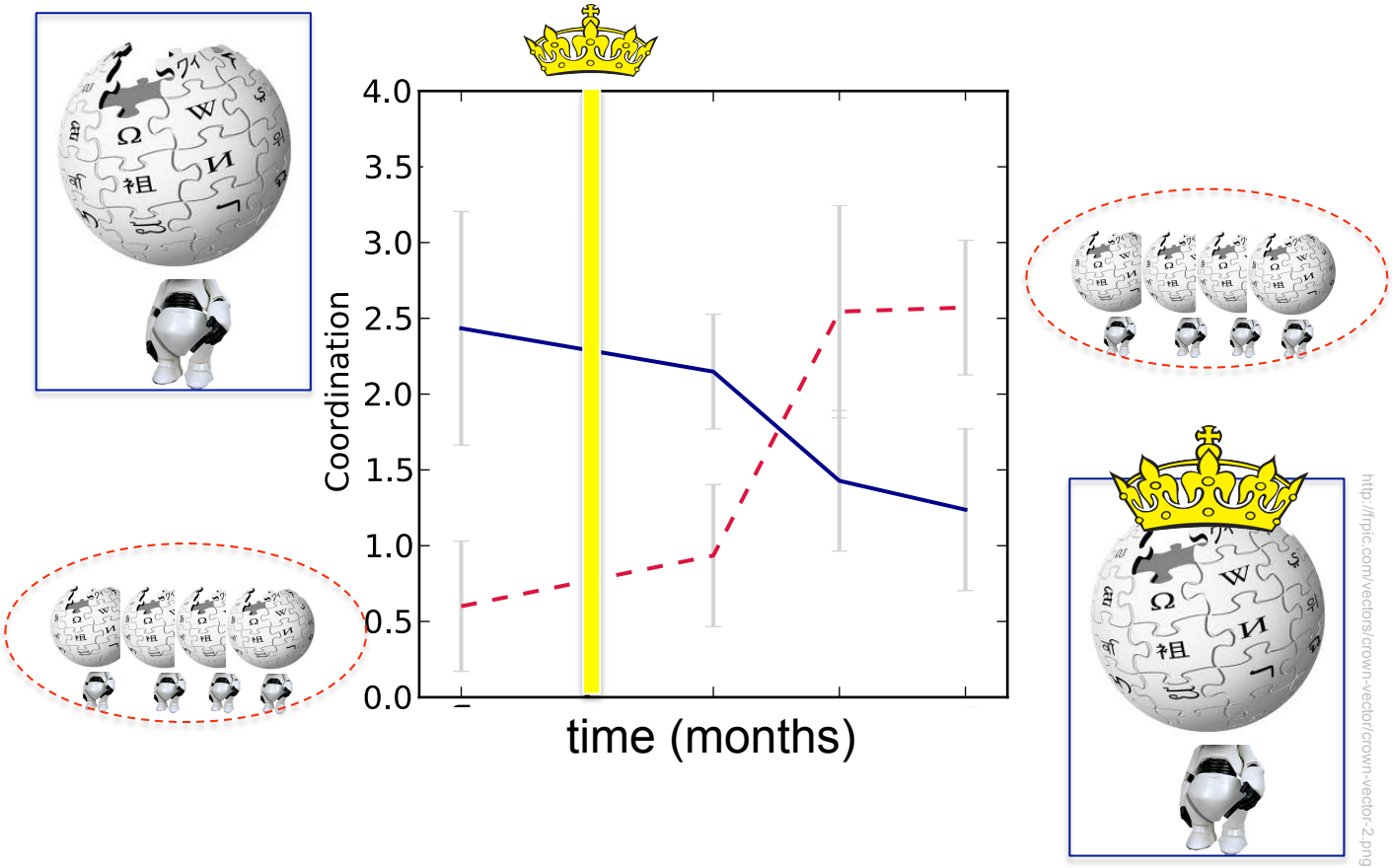


low status to high status

high status to low status

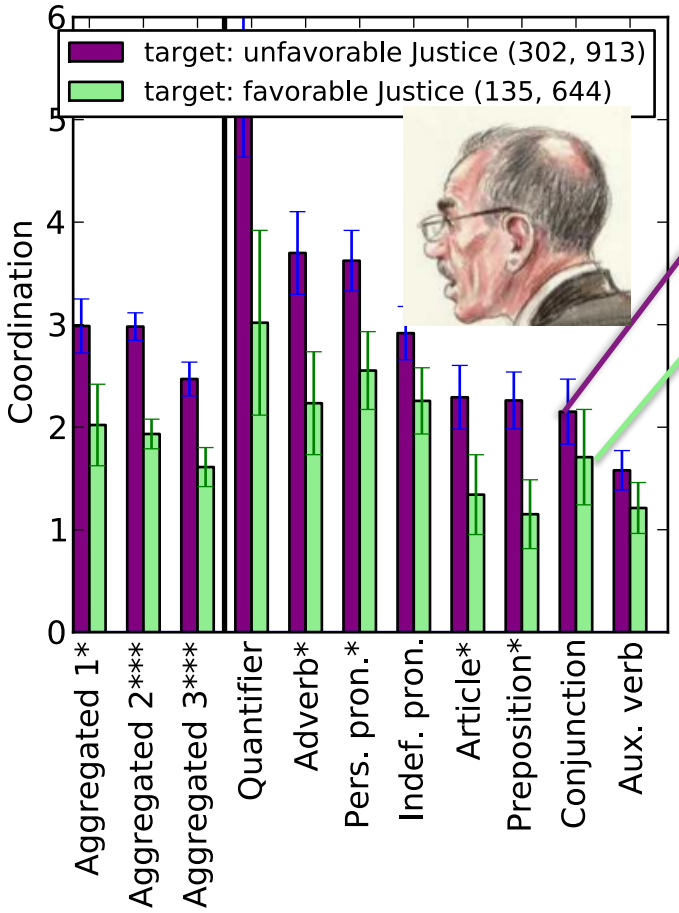
Status change in Wikipedia

240,000 exchanges + metadata (download from my webpage)



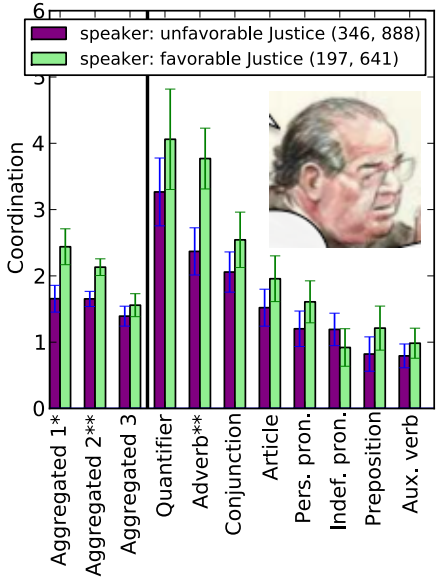
Dependence in Supreme Court transcripts

Power differences can arise from *dependence* [Emerson 1962]

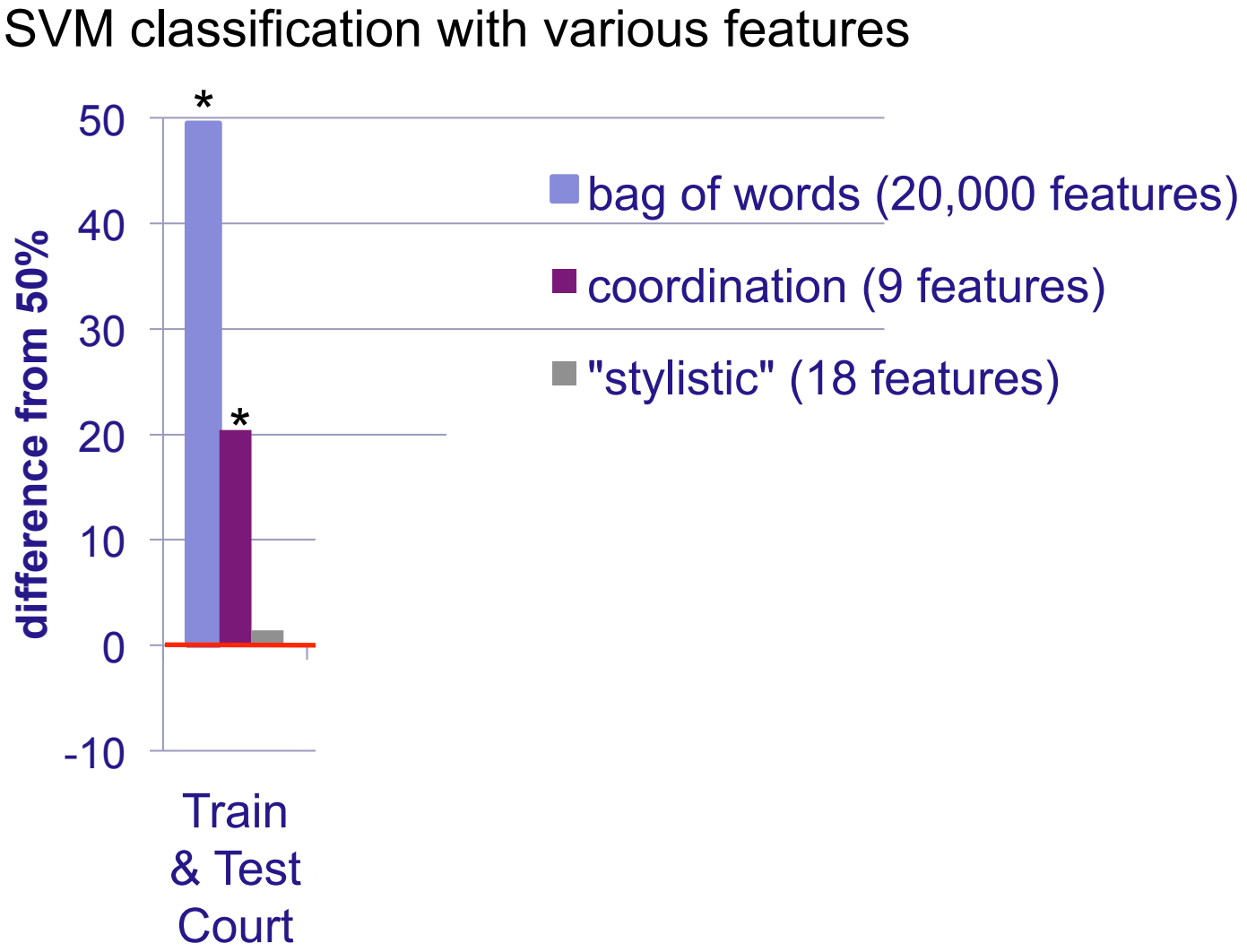


need to change their mind

already on your side



Evidence of domain independence



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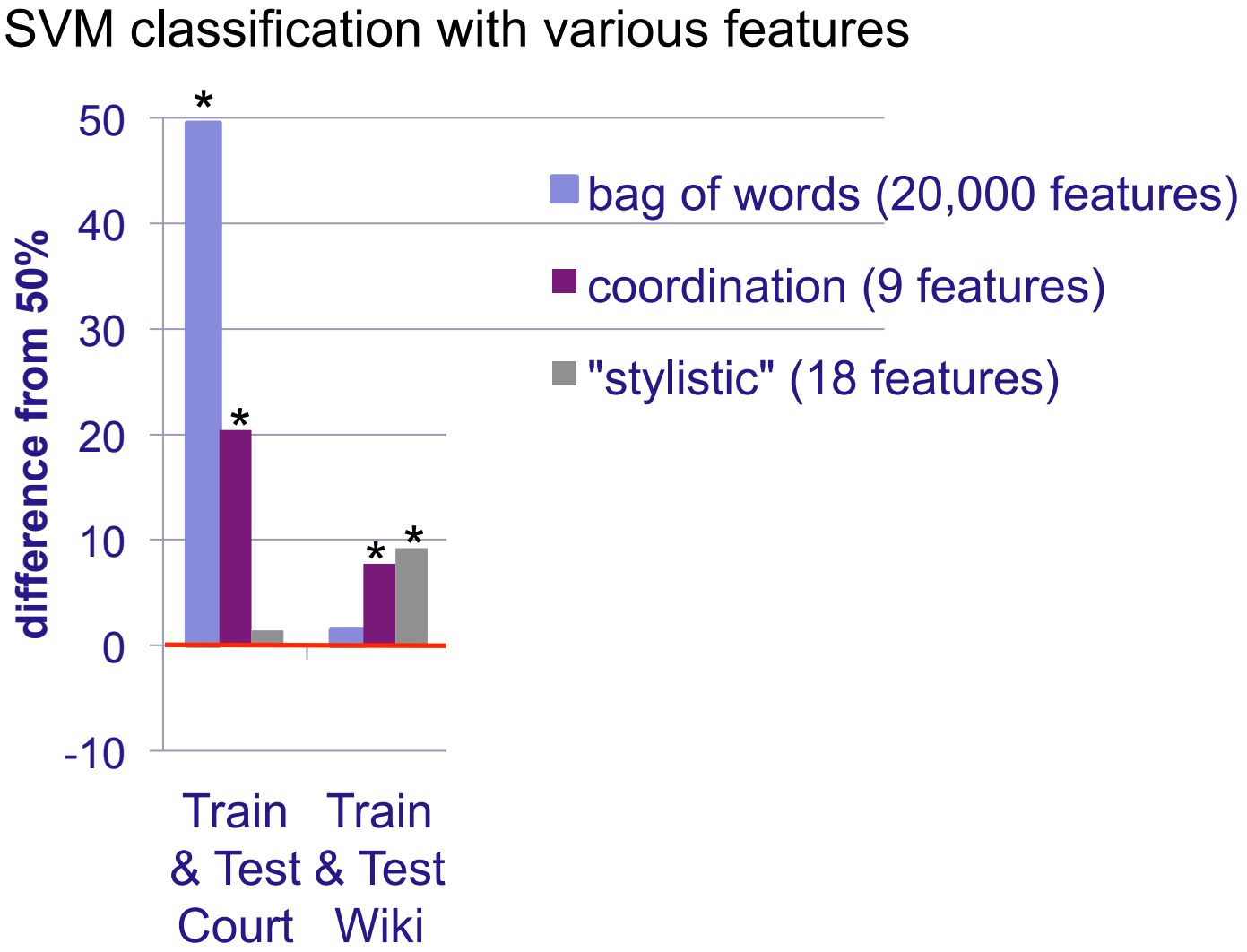

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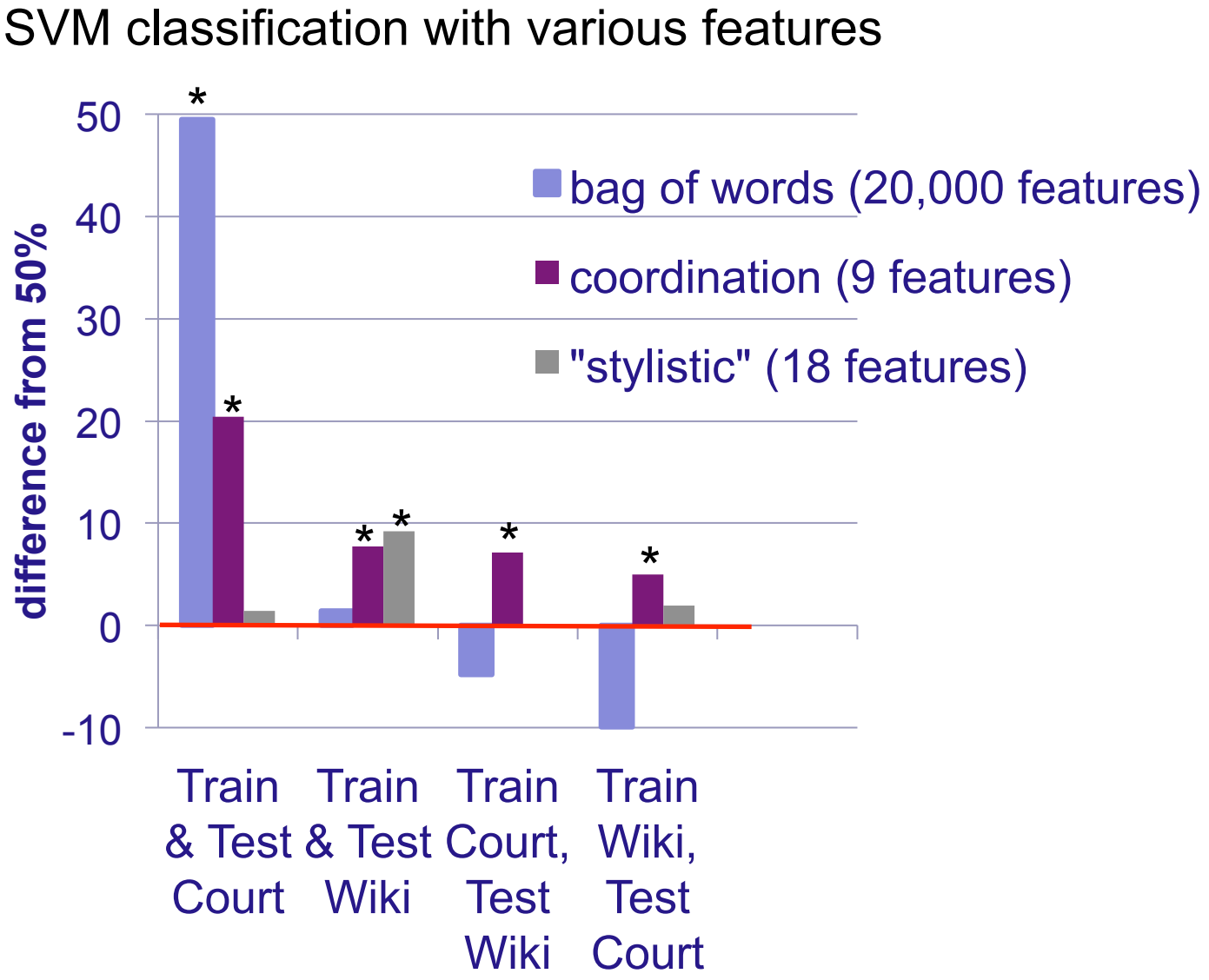

No country for old members:

User lifecycle & linguistic change in online communities

C. Danescu-Niculescu-Mizil, R. West, D. Jurafsky, J. Leskovec, & C. Potts

Best paper award, WWW 2013

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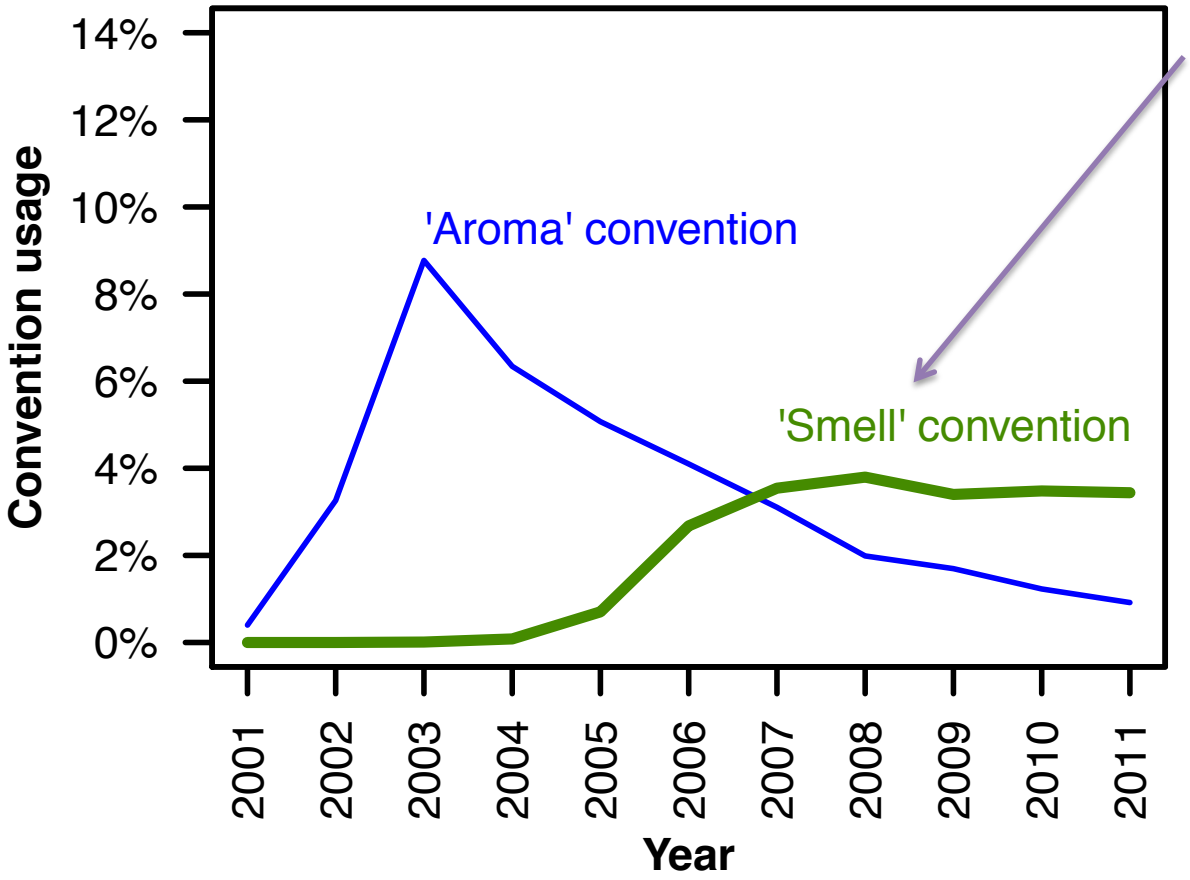
Group linguistic innovation

10+ year online group devoted to rating beers, ~30K users

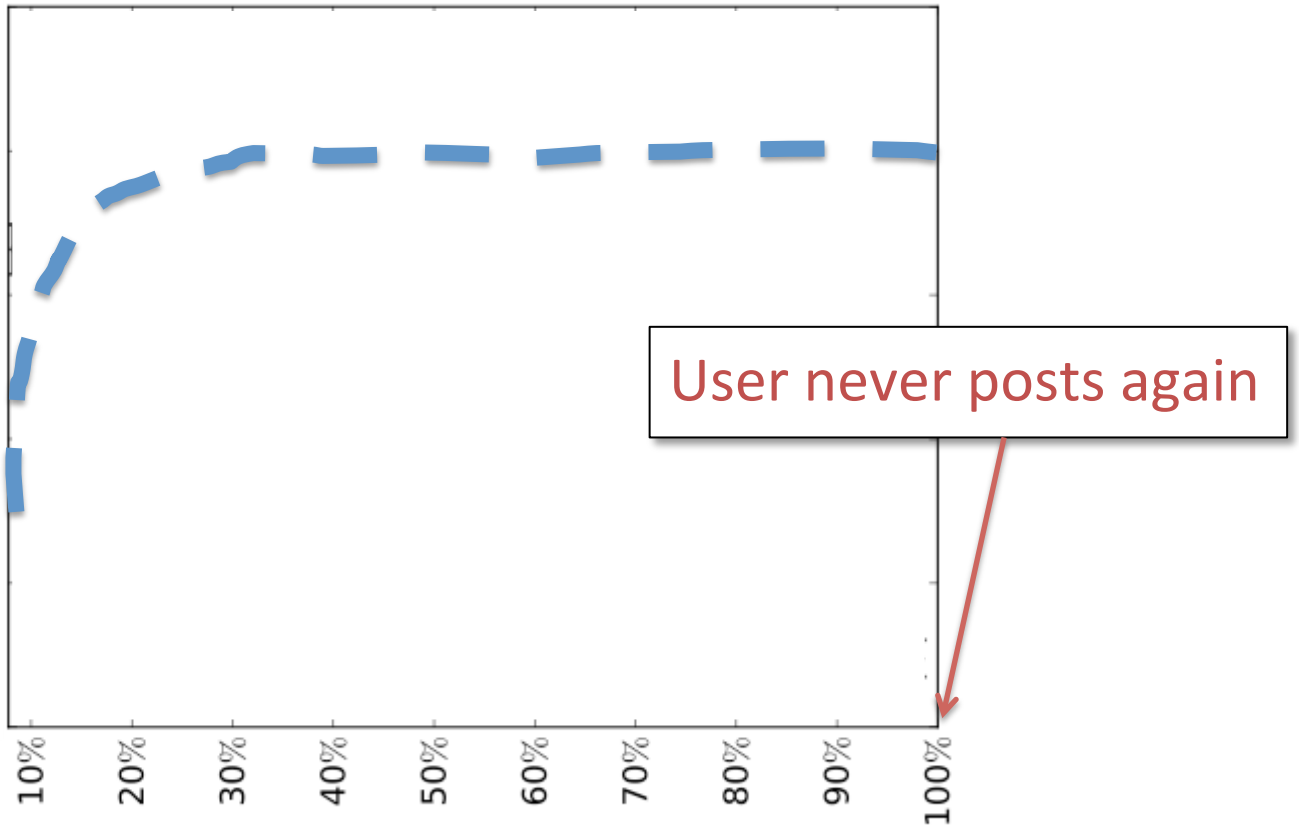


Language innovation:
Never previously used, then used by at least 10 users for multiple producers and products for 6 months.

There are an average of 97 per month.

Hypothesis: a user starts out of sync, then synchronizes

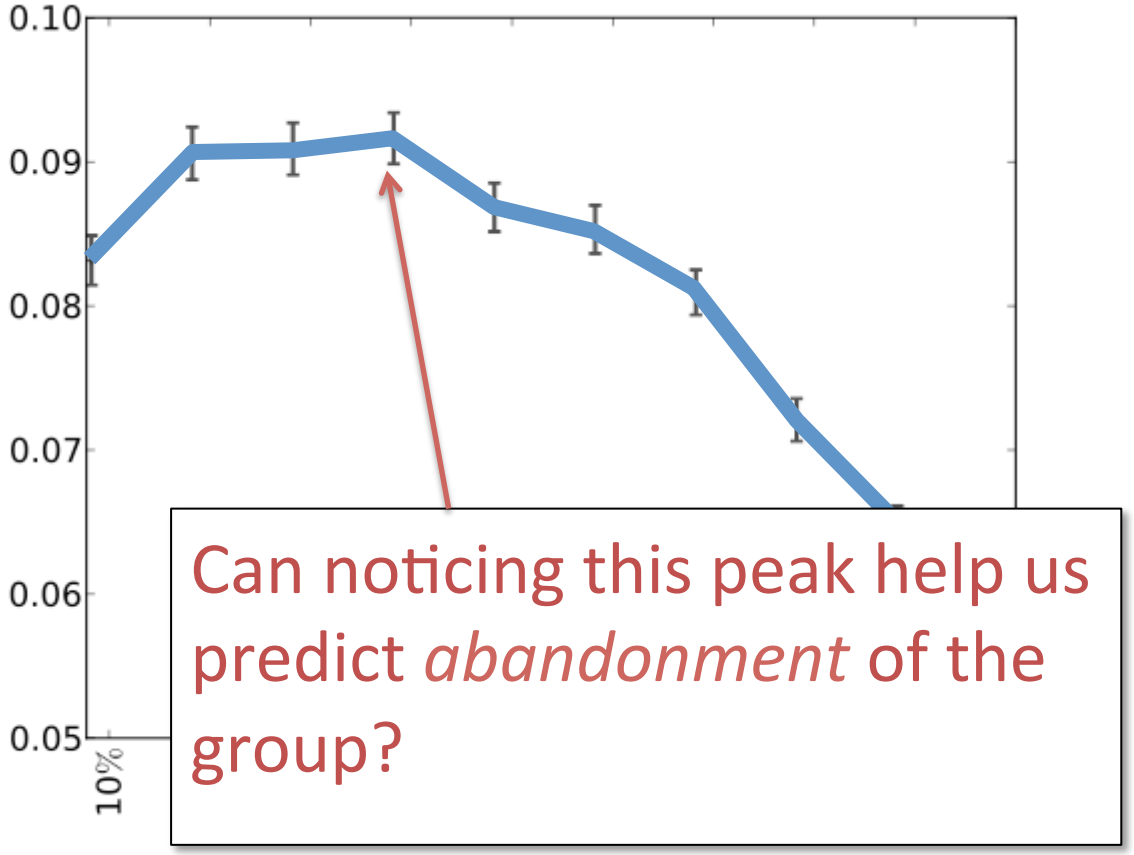
Average probability of adopting group innovations



post at i^{th} percent of all reviews posted

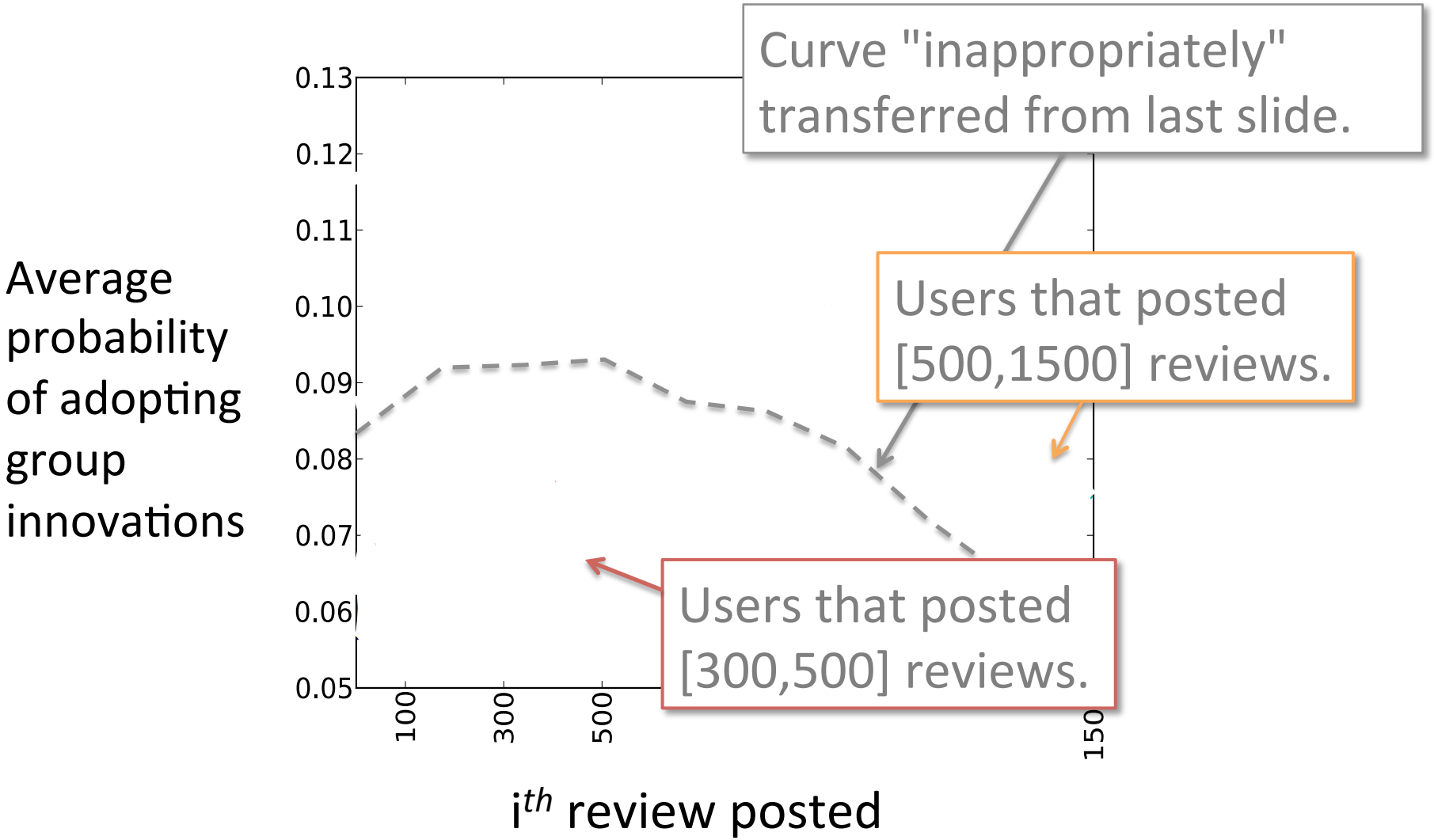
Actual lifecycle pattern

Average probability of adopting group innovations



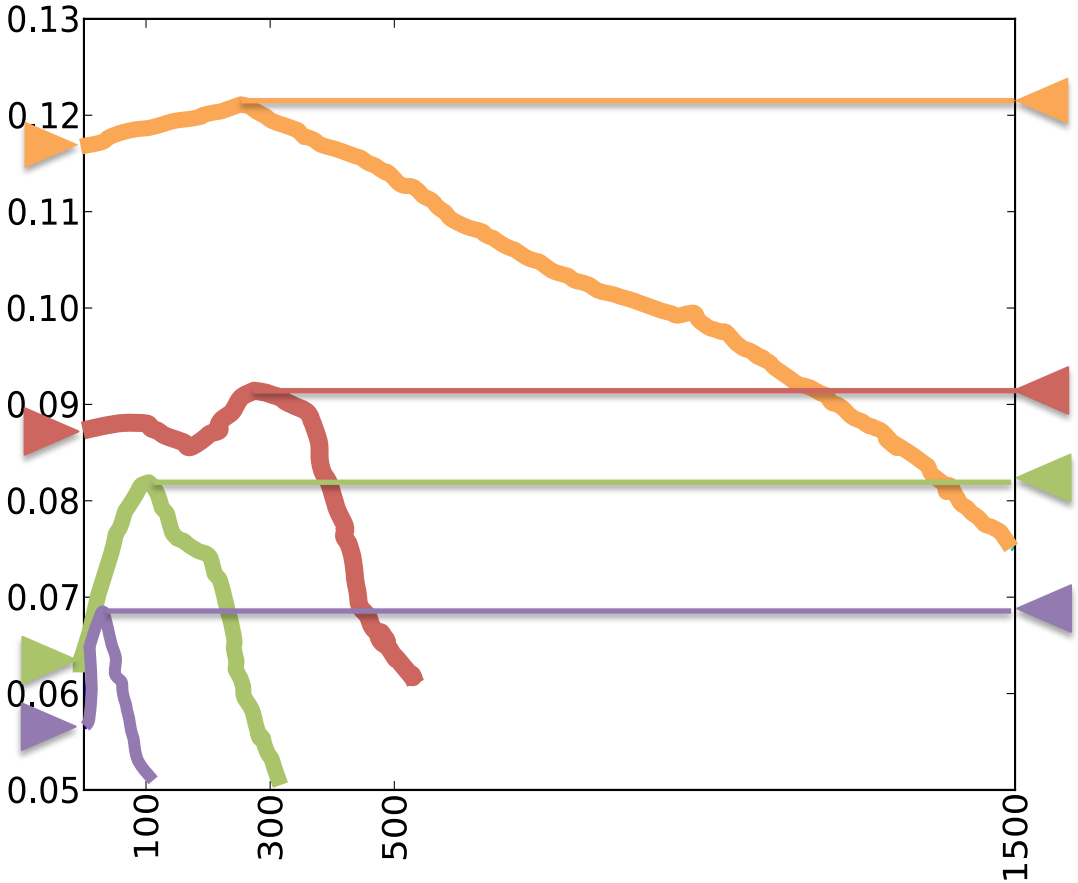
post at i^{th} percent of all reviews posted

Lifecycle pattern by *absolute* lifespan



Observation: Initial/peak value vs. lifespan

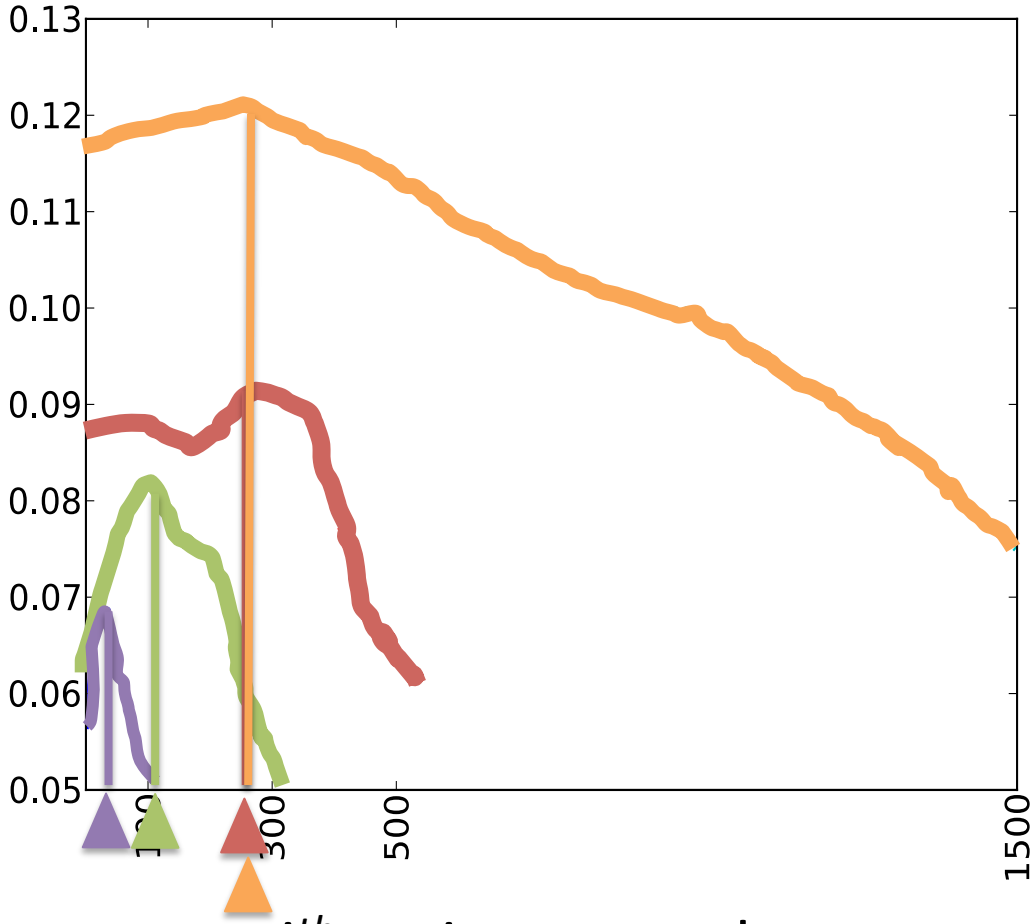
Average probability of adopting group innovations



i^{th} review posted

Observation: Peak timing vs. lifespan

Average probability of adopting group innovations



Predicting imminent user exit

Task: Given the **first 20*** posts,
will the user abandon the community soon*?

Synchronization features:

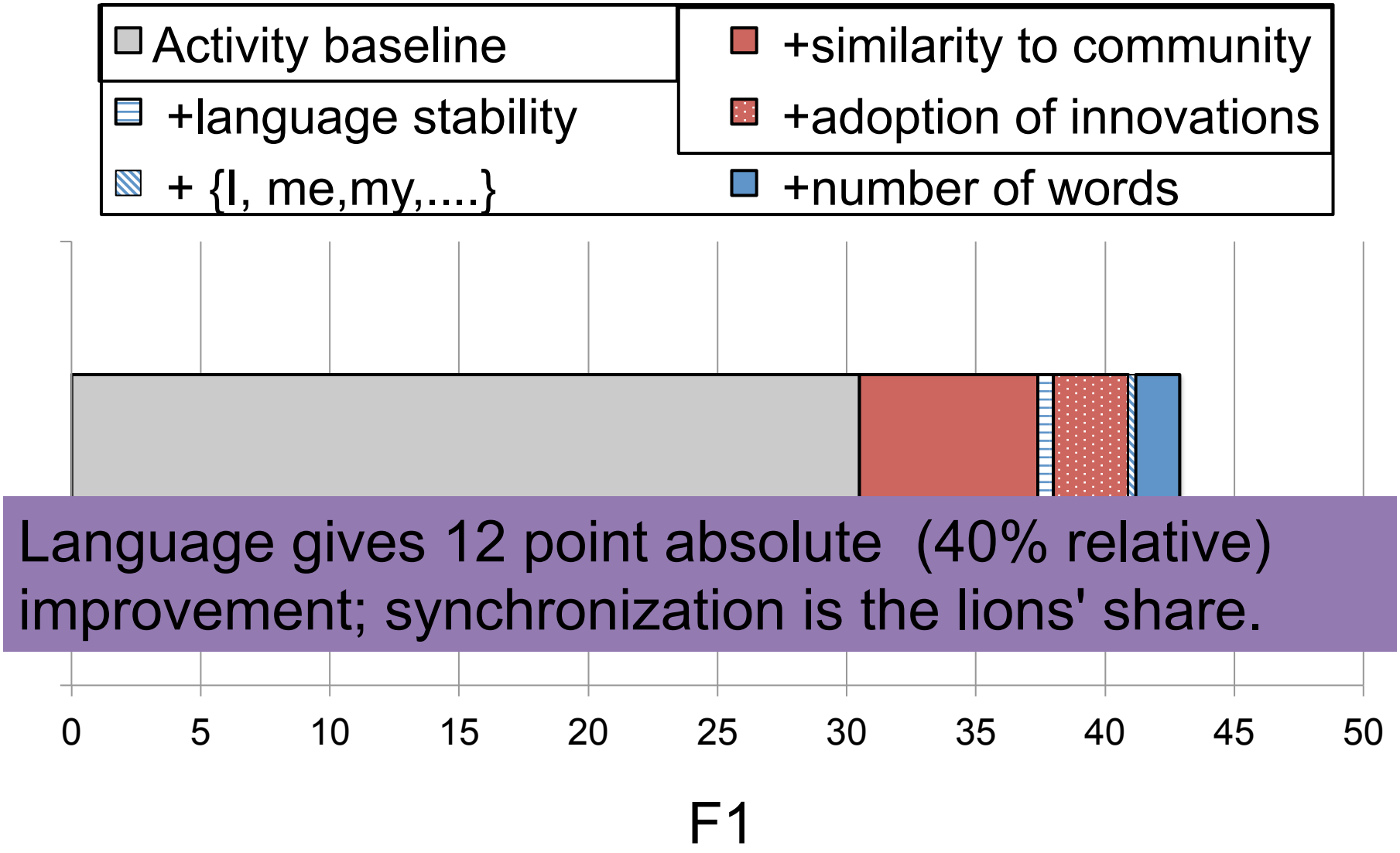
- adoption of group lexical innovations
- *similarity to the community's language*

Non-synchronization linguistic features
(cf. predicting length of membership [Nguyen and Rosé '11])

- linguistic stability
- use of 1st-person singular
- post length

(Strong) activity-based baselines
Inspired by churn prediction: Dror et al. '12, Yang et al. '10]

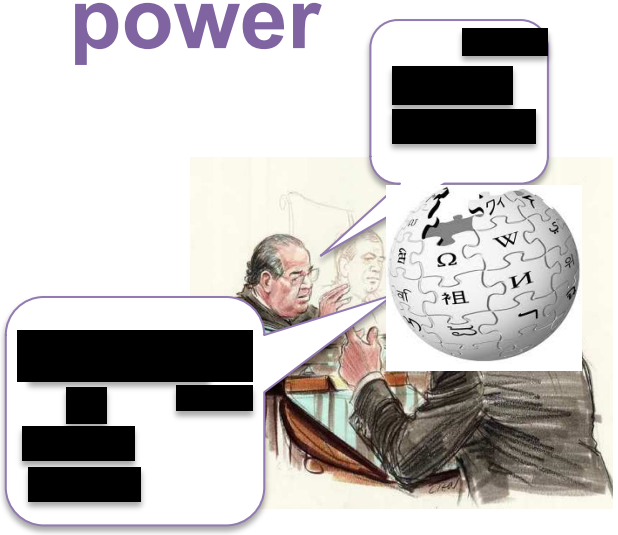
Predicting imminent exit



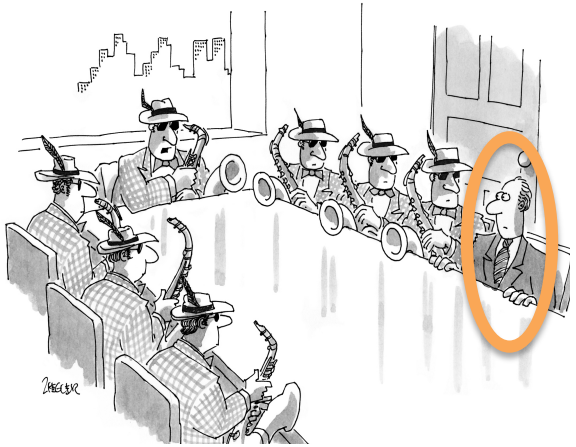
Summary

- Two projects incorporating degree of asymmetric linguistic synchrony

power



lifespan in group



- Future: even more synchrony between language analysis and social aspects

Questions?
(and, thank you!)
WOOF?
WOOF?
WOOF?
WOOF?
C. Barsotti