Emotion, Tie Persistence, and Network Structure on Twitter

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social media information lab?

social media research:

1. what are people doing (and why)?

social media research:

2. understanding social systems at scale

social media research:

3. creating new experiences

social

media

awareness streams

networks

today's big story

generate a better understanding of the social dynamics

validate theories from social sciences in these new and important settings

today's more specific story

Twitter and networks:

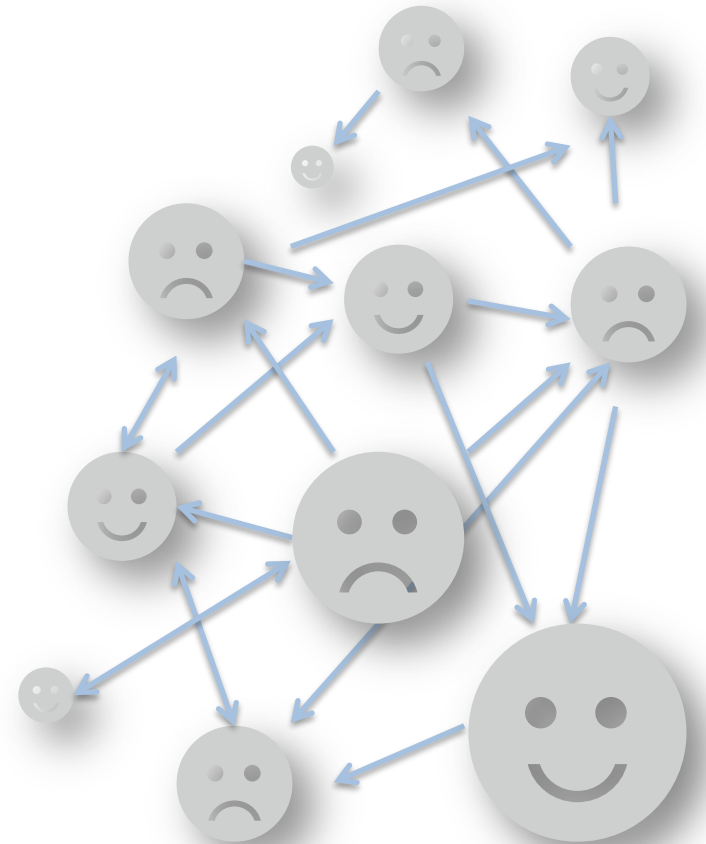**Part 1.** social sharing of emotion and networks on Twitter
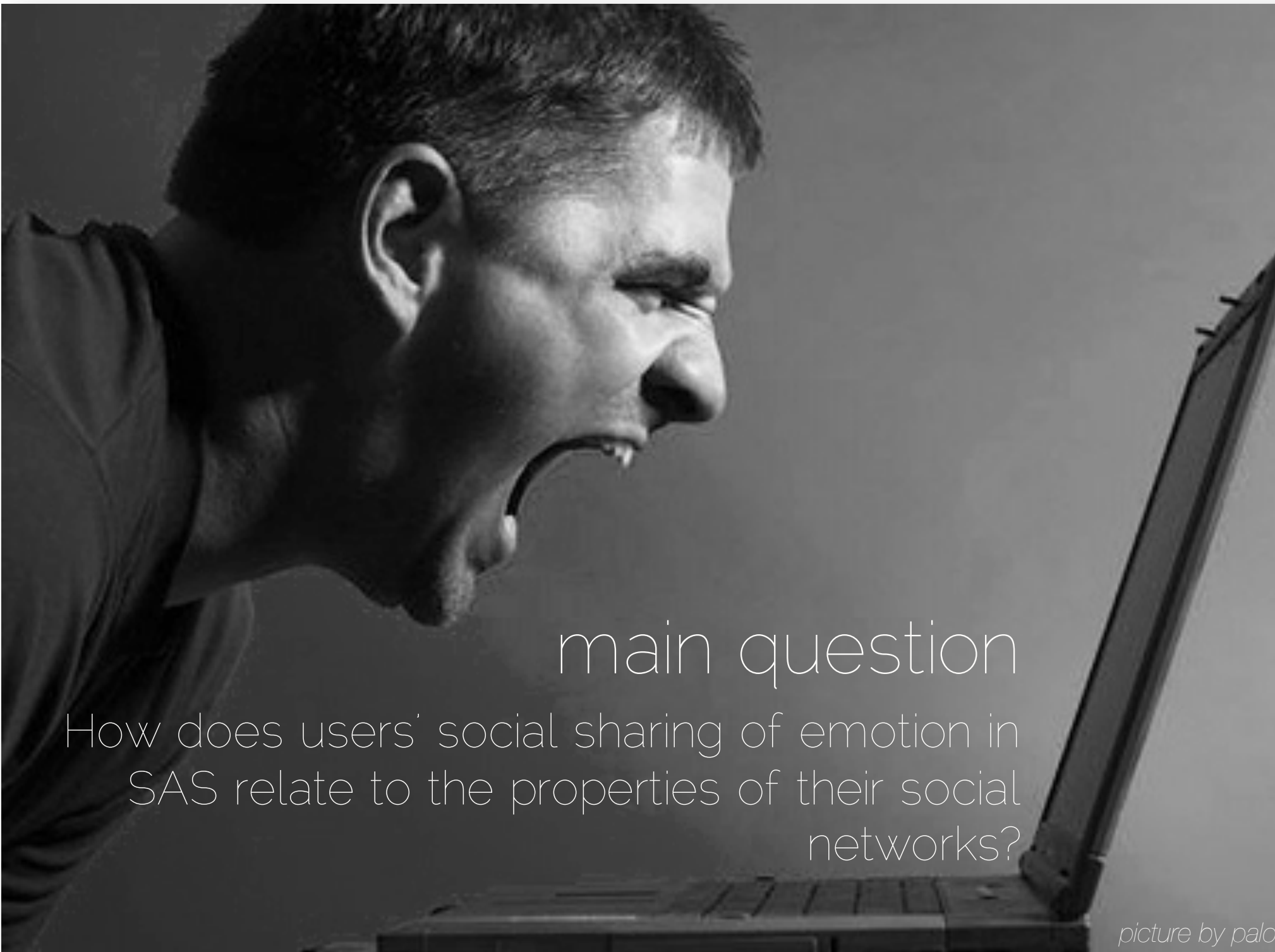
Part 2. unfollowing on Twitter

study 1

emotion & social networks

Kivran-Swaine & Naaman. Network Properties and Social Sharing of Emotions in Social Awareness Streams. (CSCW 2011)

main question

How does users' social sharing of emotion in SAS relate to the properties of their social networks?

picture by palo

research questions

RQ1

What is the association between people's tendency to express emotion (joy, sadness, other) in their posts (updates or interactions) and their number of followers?

research questions

RQ2

What is the association between people's tendency to express emotion (joy, sadness, other) in their posts (updates or interactions) and their network characteristics like density and reciprocity rate?

David A. Shamma

@ayman iPhone: 47.563553,-122.363365

*research scientist. media artist. instructions: place in direct
sunlight, water daily*

http://shamurai.com

✓ **Following** 📋 🔁

Message ☰▾ ⚙▾

| Timeline | Favorites | Following ▾ | Followers ▾ | Lists ▾ |

AymanM Ayman Mohyeldin ⇄ by ayman 🎞
The Birth of a New Egypt... http://fb.me/HN1Lit3Y
6 hours ago

ayman David A. Shamma 💬
@landay 1password - slick, nice integration, and uses dropbox to
autosync.
13 Feb

RawyaRageh Rawya Rageh ⇄ by ayman
Dawn prayers in #Tahrir sq. I came so close to crying on air. Good
morning from a new #Egypt
11 Feb

ayman David A. Shamma
Obama's gonna speak about #egypt #jan25 any minute now
whitehouse.gov/live/president... #fb

About @ayman

2,124	**268**	**1,211**	**53**
Tweets	Following	Followers	Listed

Connections

Also followed by @chkofler, @uxrick, @dwmcphd, and more.

You both follow @dwmcphd, @lyndonkennedy, @cscw2011

Following 268

Similar to @ayman · view all

dmrussell · Follow
dmrussell

chloester
Chloe Fan

bederson · Follow
Ben Bederson

drewww
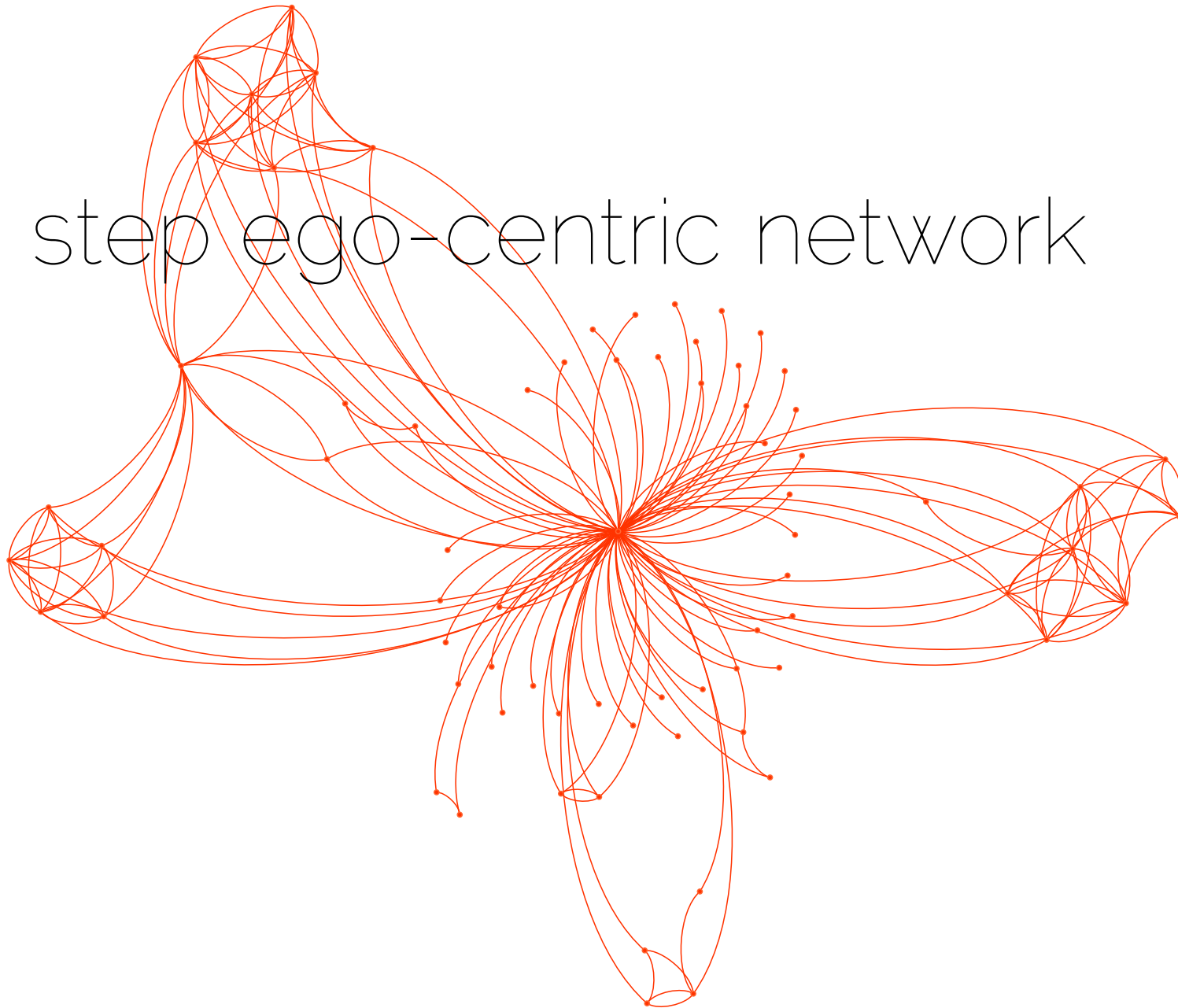Drew

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1.5 step ego-centric network

theory background

expression of emotion ⬌ number of followers

(–) people who mostly post about themselves have significantly lower number of followers[*]

(+) emotional broadcaster theory

[*] Naaman, Boase, Lai (CSCW 2010)

theory background

expression of emotion ⬌ network density
expression of emotion ⬌ reciprocity rate

(+) intimacy

(–) curbing

data

content dataset from Naaman, Boase, Lai (2010)
social network dataset from Kwak et al. (2010)

105,599 messages from 628 users who:

  had no more than 5,000 followers or followees

  posted at least one Twitter update in July 2009 in English

  still had public profile in April 2010

pilot study

joy

on average 23% of a user's updates

"First snuggle at Stumpy of fair grounds were Yay!" "Two women got the last copy of a... awesome. Sophia had a blast. Lucy said, "ooooh," over and over. Good times with my family.!"

sadness

on average 10% of a user's updates

"RIP Kathy. Live life for today. You never know how long you have.!"

study details

automated analysis of the users' tweets based on LIWC

"expression of emotion" => "existence of emotive words"

some gender differences

 joy

 sadness

 other emotions

analysis

independent variables:
    joy (interactions-updates),
    sadness (interactions-updates),
    emo (interactions-updates)

3 linear regression models for dependent variables:
    number of followers
    network density
    reciprocity rate

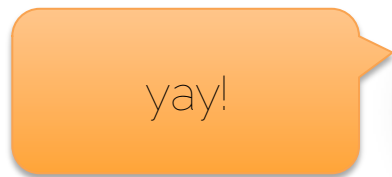# results

... explaining number of followers (R^2 = .22)

@follower ... ☺ joy-interactions .35 [**]

@follower ... ☹ sadness-interactions .20 [**]
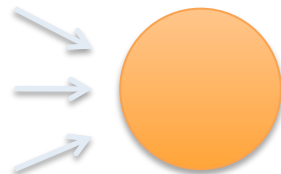
[**] p < .01

results

... explaining network density (R^2 = .33)

yay!   joy-updates -.10 [**]

@follower ...   sadness-interactions -.18 [**]

number of followers -.50 [**]

[**] p < .01

limitations & future work

better emotion classifier

improve sampling, increase dataset

culture dependent

dyad-level analysis

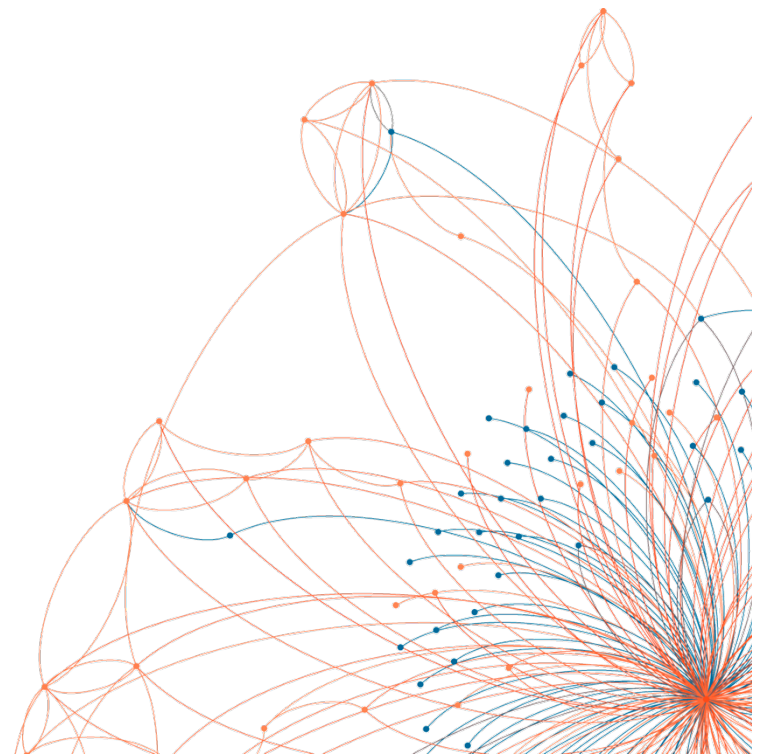# today's more specific story

Twitter and networks:

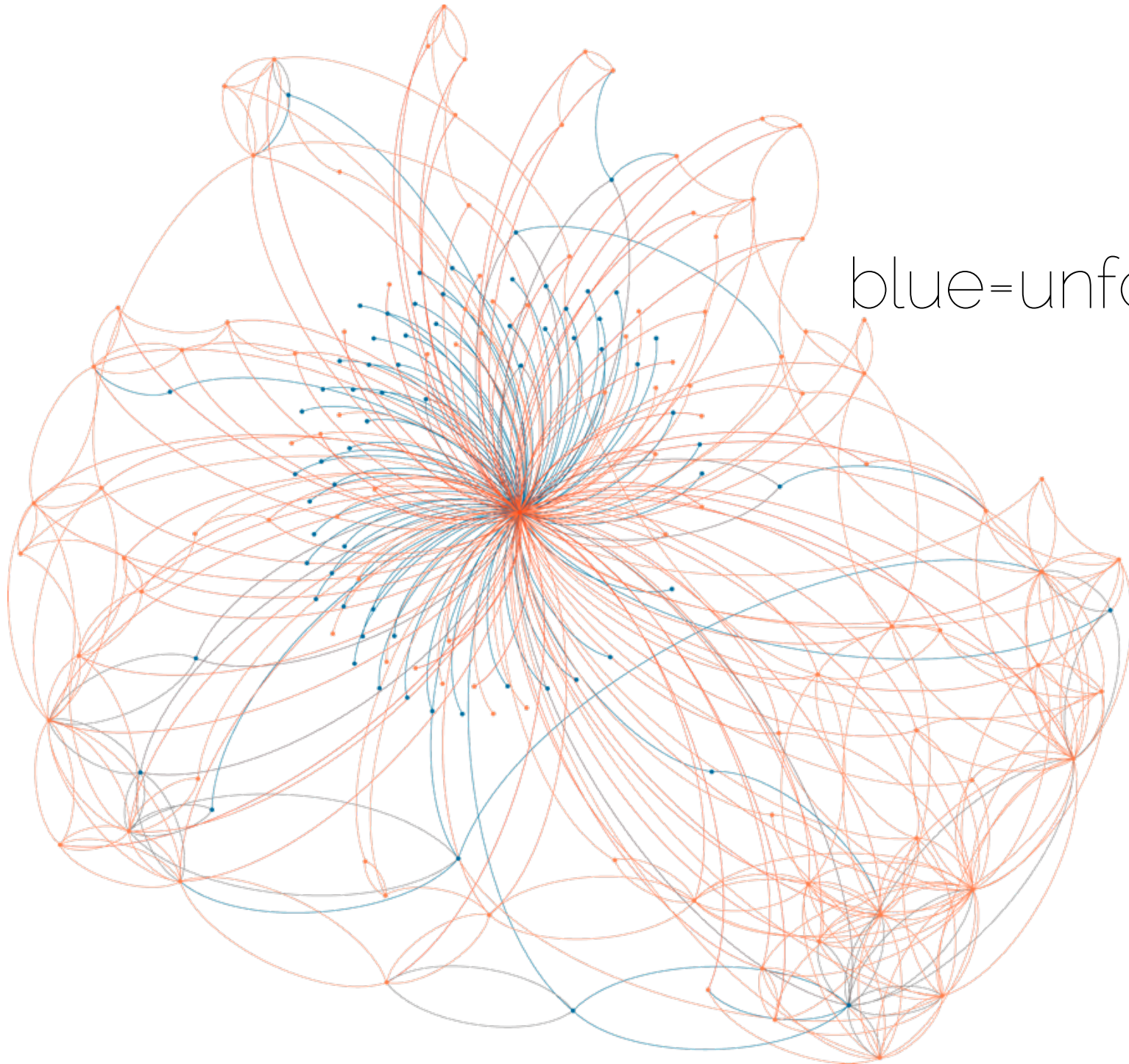**Part 1.** social sharing of emotion and networks on Twitter

Part 2. unfollowing on Twitter

study 2

unfollowing on Twitter

Kivran-Swaine, Govindan & Naaman.
The Impact of Network Structure on
Breaking Ties in Online Social
Networks: Unfollowing on Twitter.
(CHI 2011).

blue=unfollow

main question:

what structural properties of the social network of nodes and dyads predict the breaking of ties (unfollows) on Twitter?

theory background

tie strength
embeddedness within networks
power & status

data

content dataset from Naaman, Boase, Lai (2010)
social network dataset from Kwak et al. (2010)
Twitter API – connections still exist 9 months later?

715	seed nodes
245,586	"following" connections to seed nodes
30.6%	dropped between 07/2009 & 04/2010

analysis

* independent variables (computed for our 245K dyads)

  seed properties
  > follower-count, follower-to-followee ratio, network density, reciprocity rate, follow-back rate

  follower properties
  > follower-count, follower-to-followee ratio

  dyad properties
  > reciprocity, common neighbors, common followers, common friends, right transitivity, left transitivity, mutual transitivity, prestige ratio
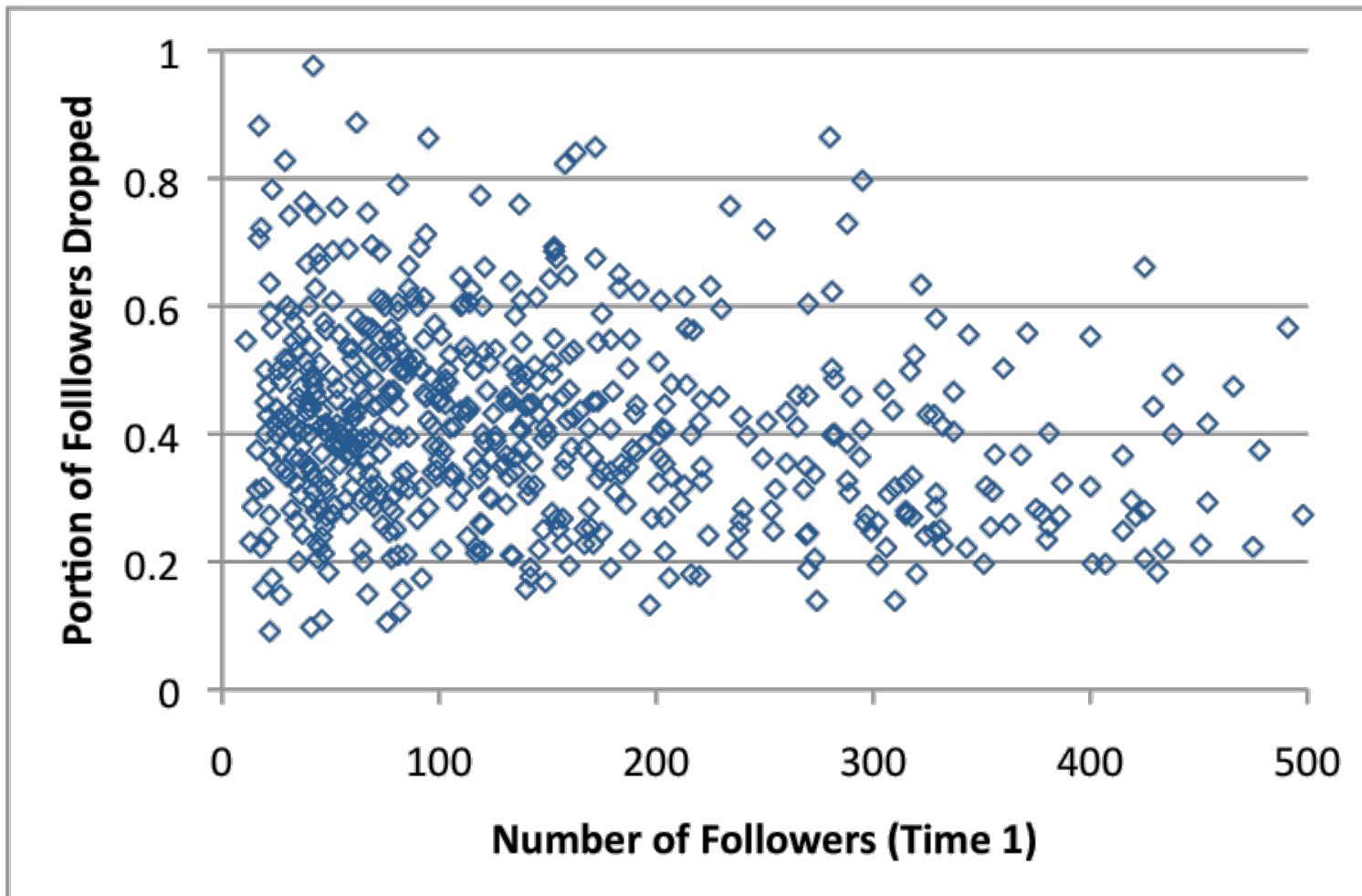
<disclaimer>

the following figures are NOT scientific evidence and are shown here for illustration purposes

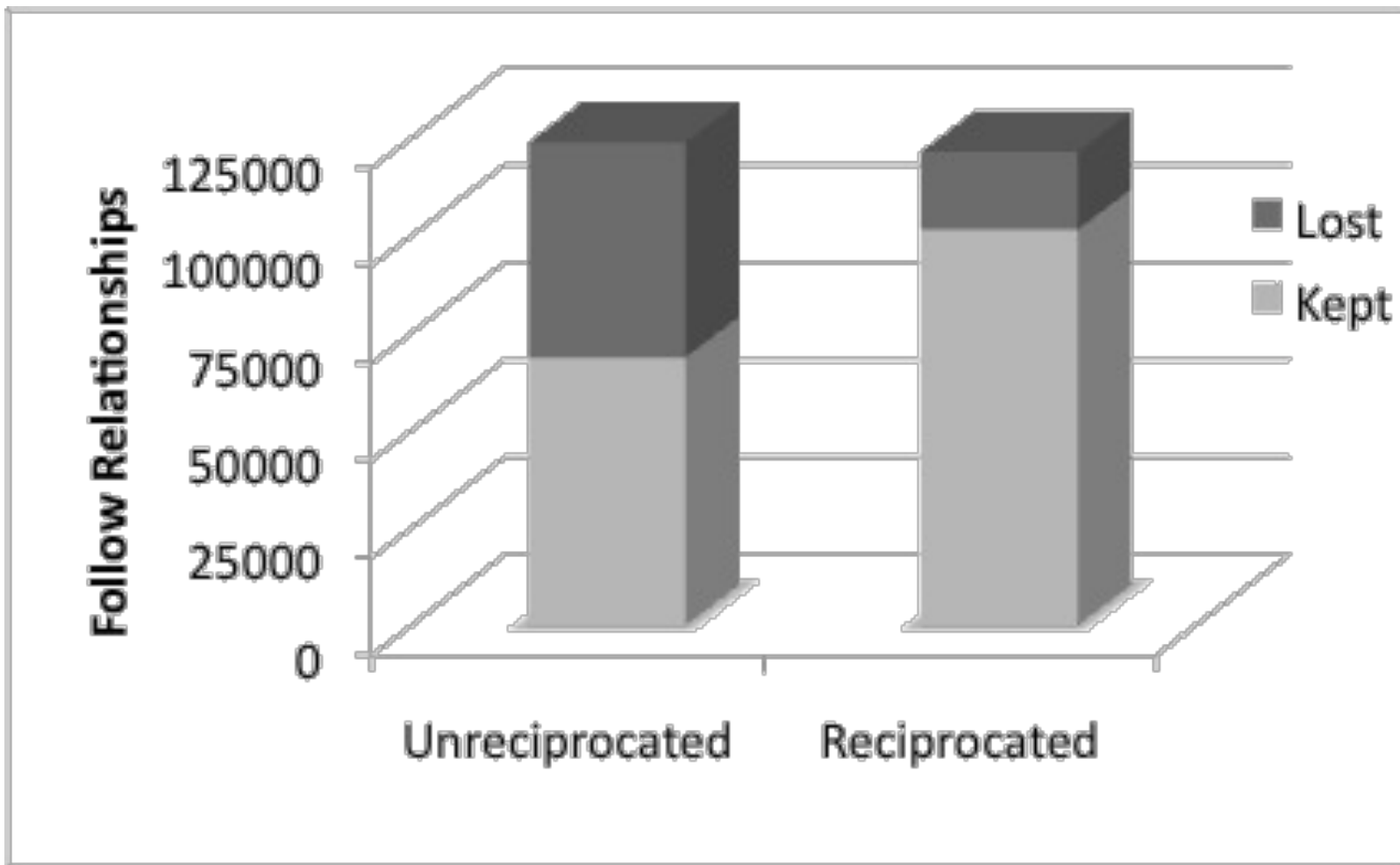no control for intra-seed effects; no inter-variable effects

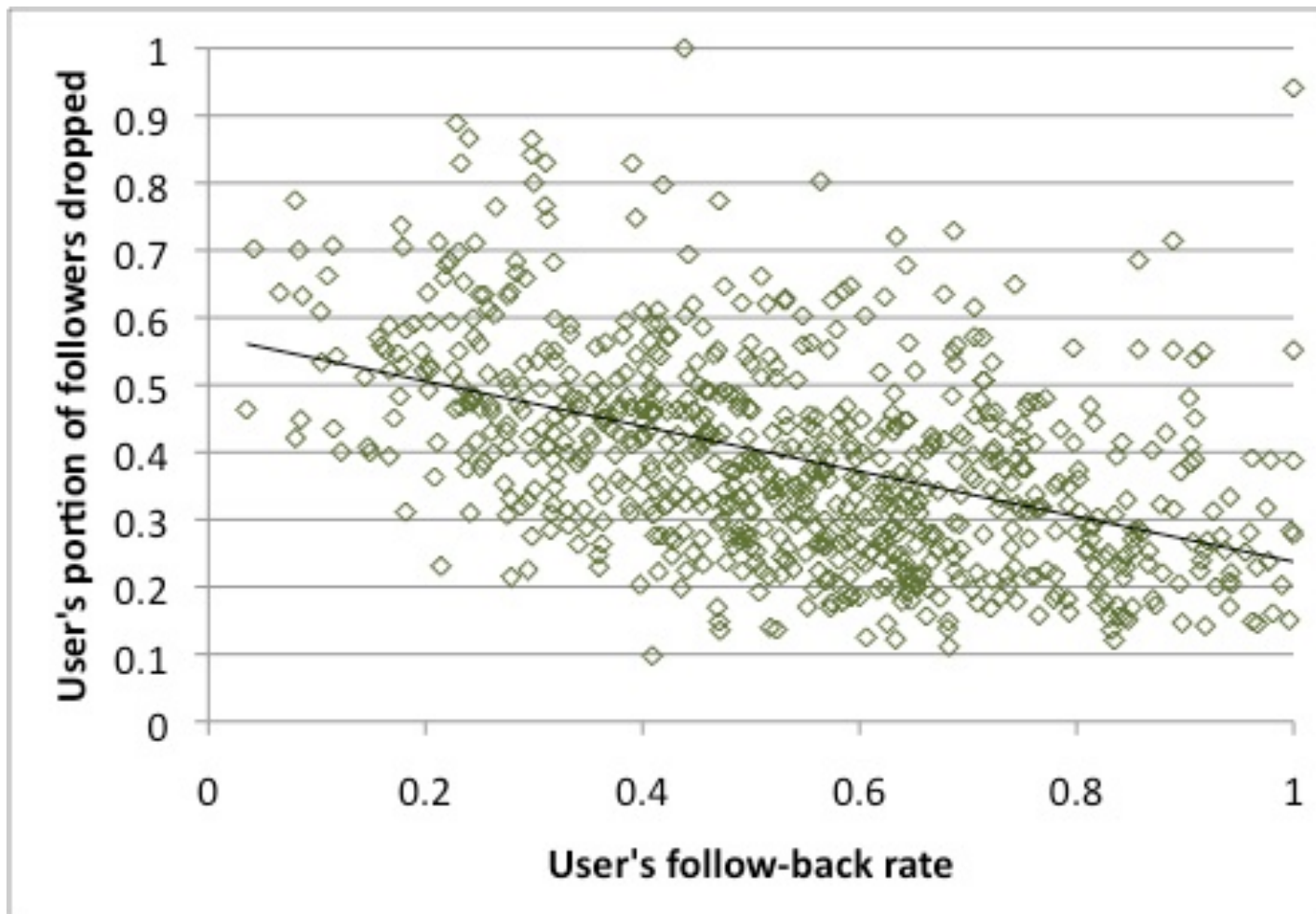no R installation was harmed in the making of the following figures

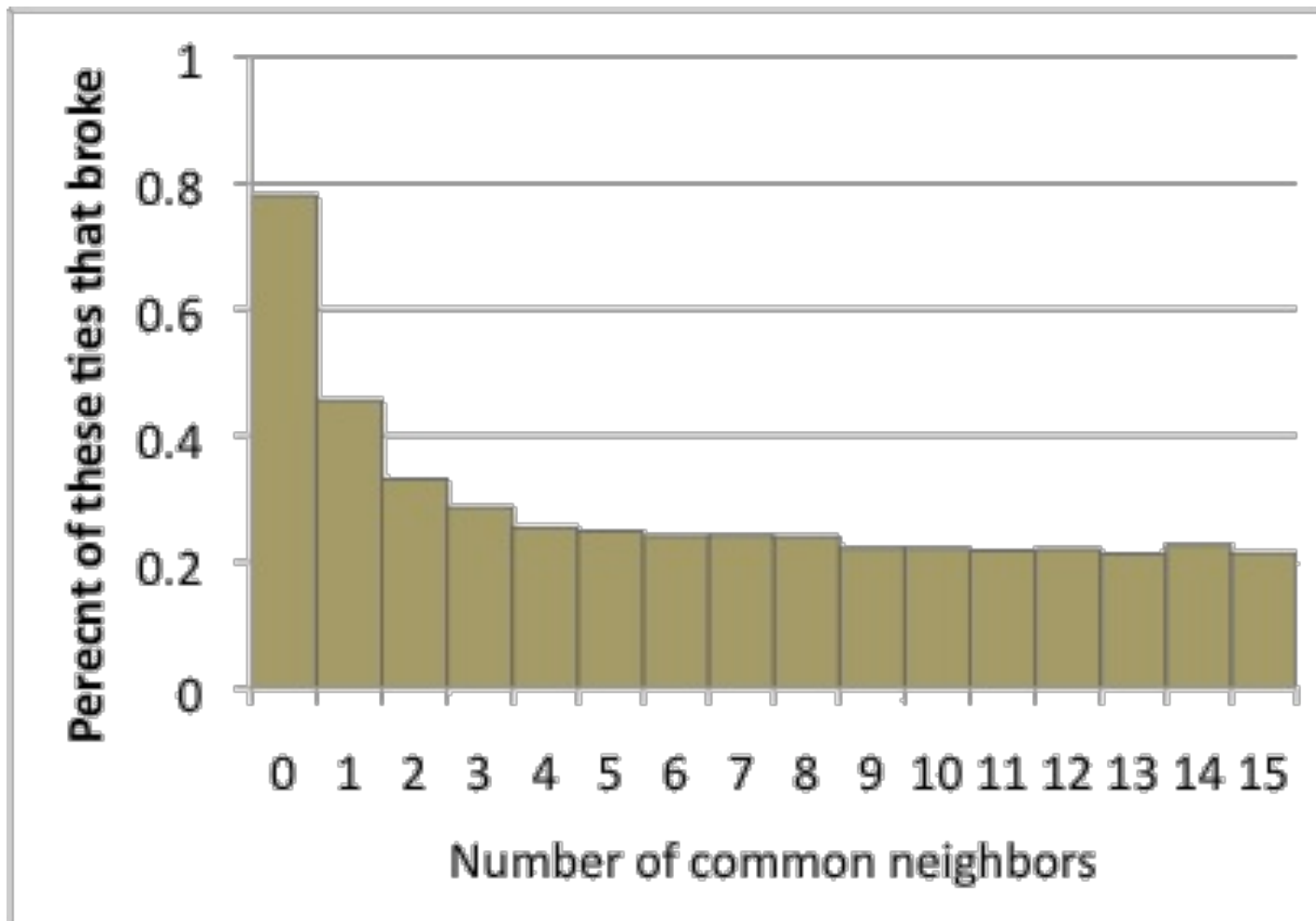# effect of number of followers (none):

effect of reciprocity (large):

effect of follow-back rate

effect of common neighbors

</disclaimer>

back to scientific results (made R break sweat)

sparing you the details, though

in-depth analysis

the details you do not want to hear (now)

multi-level logistic regression (dyads/edges nested within seed nodes)

three models; full one includes seed, follower, and dyadic/edge variables

complete details: in the paper

some results

effect of tie strength on breaking of ties

*** dyadic reciprocity (–)

*** network density (–)

*** highly statistically significant

some results

effect of power & status on breaking of ties

    *** prestige ratio   (+)

    *** follow-back rate (-)

    *** f's follower-to followee ratio (-)

    *** dyadic reciprocity (-)

    *** highly statistically significant

some results

effect of embeddedness on breaking of ties

*** common neighbors (–)

*** highly statistically significant

limitations & future work

only two snapshots: add more

additional (non-structural) variables (e.g., frequency of posting!)

emotion and tie breaks

...and even broader

what can we learn from social dynamics on Twitter (and Facebook) about:

    our relationships?

    our language?

    our society and culture?

    our interests and activities?

for more details

http://bit.ly/MorInfoSeminar

thank you

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http://bit.ly/MorInfoSeminar

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