social influence

facebook June to Aug 2007

50 M users

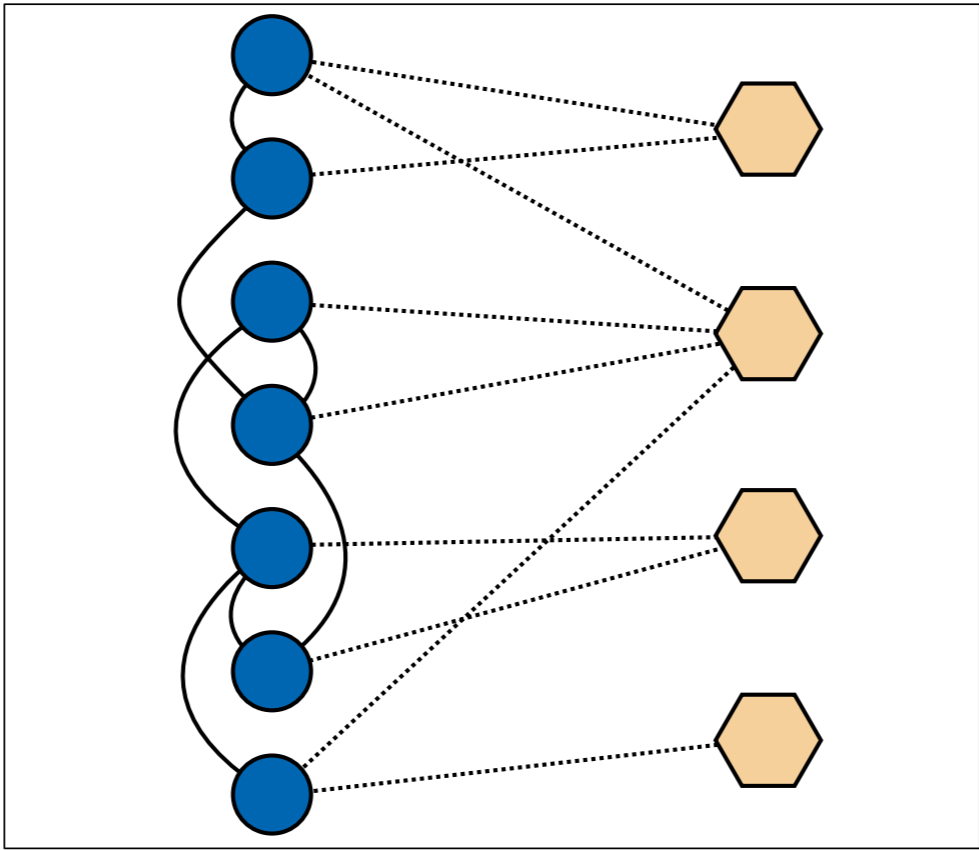download activity - per hour - June 25 to August 14, 2007
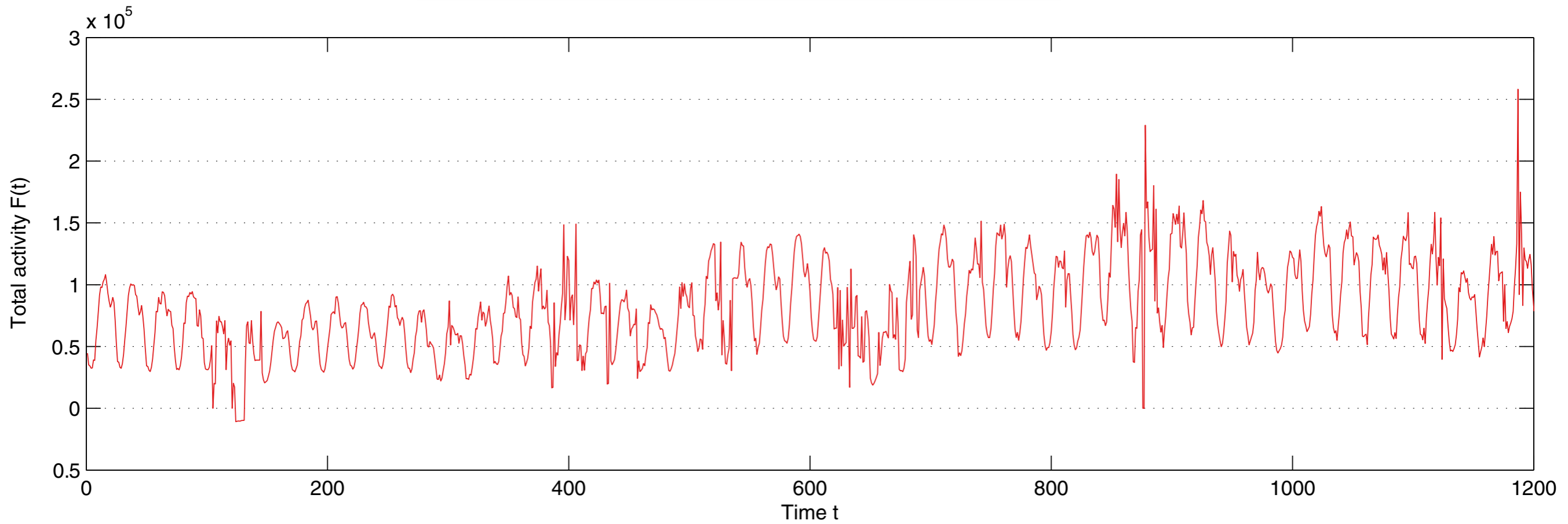
local and global signals - fully endogenous

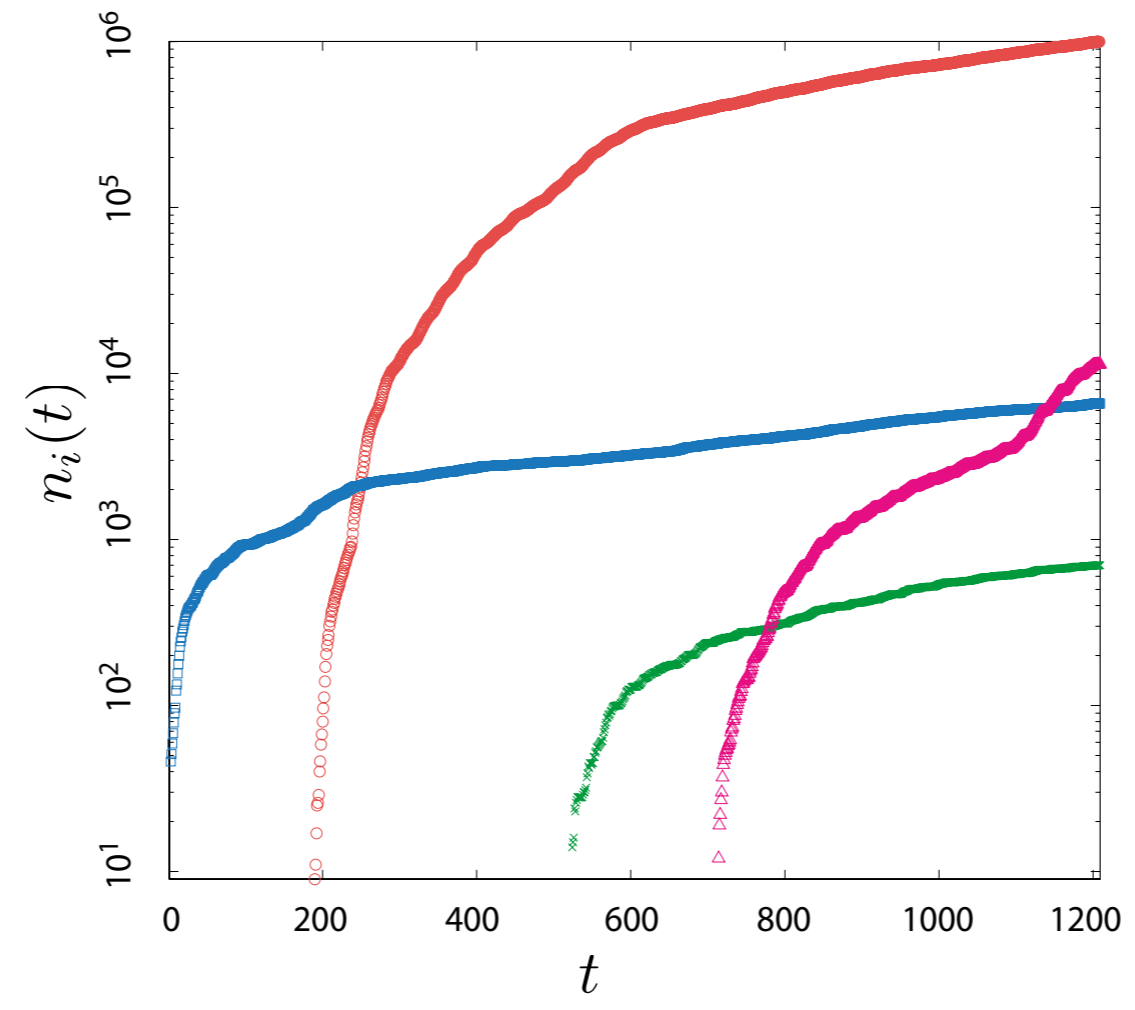agents make decisions to install apps (vs being passively infected)

no selection bias - all of 2700+ apps

no bias by popularity either

$i(t)$

t

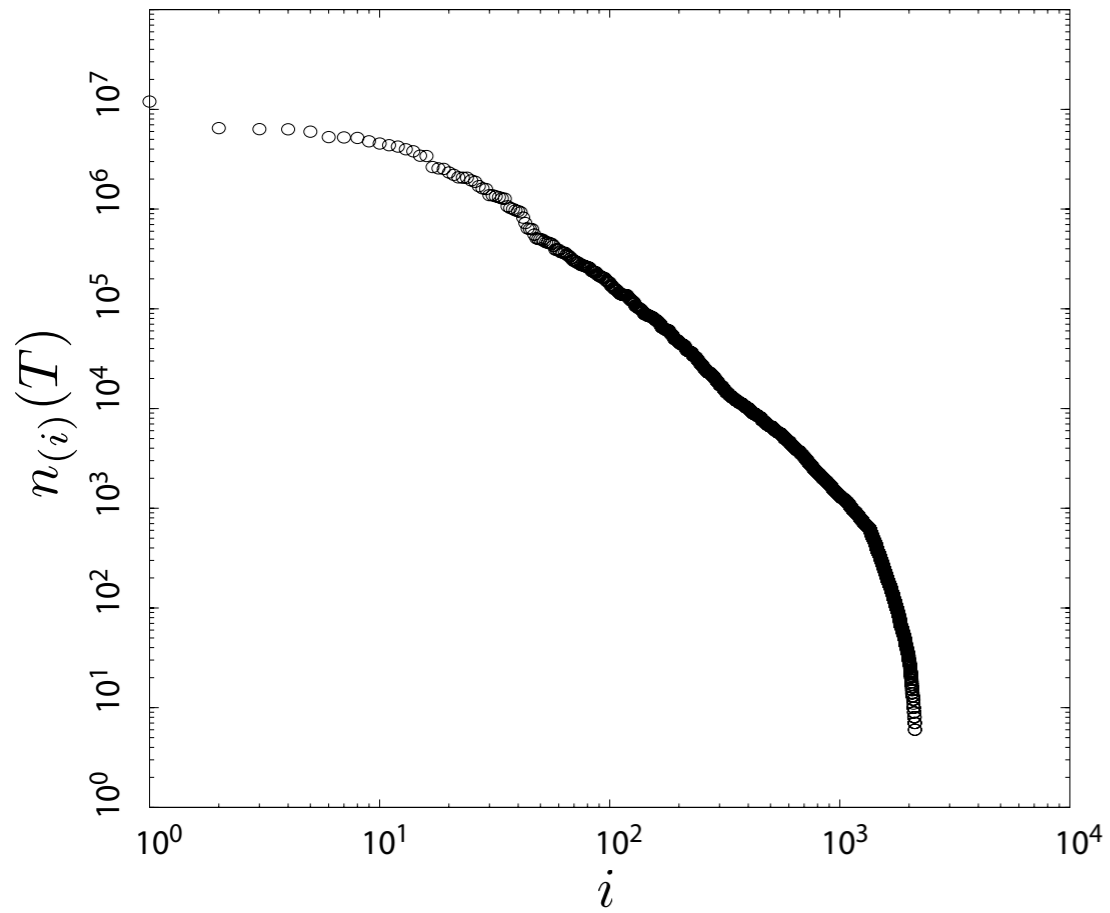a local signal can propagate in the blue-blue network

ni(t) with i = 1,2,...,M = 2,720 and t = 1,2,...,T = 1,208

some popular apps - the initial derivative seem to predict the final level?

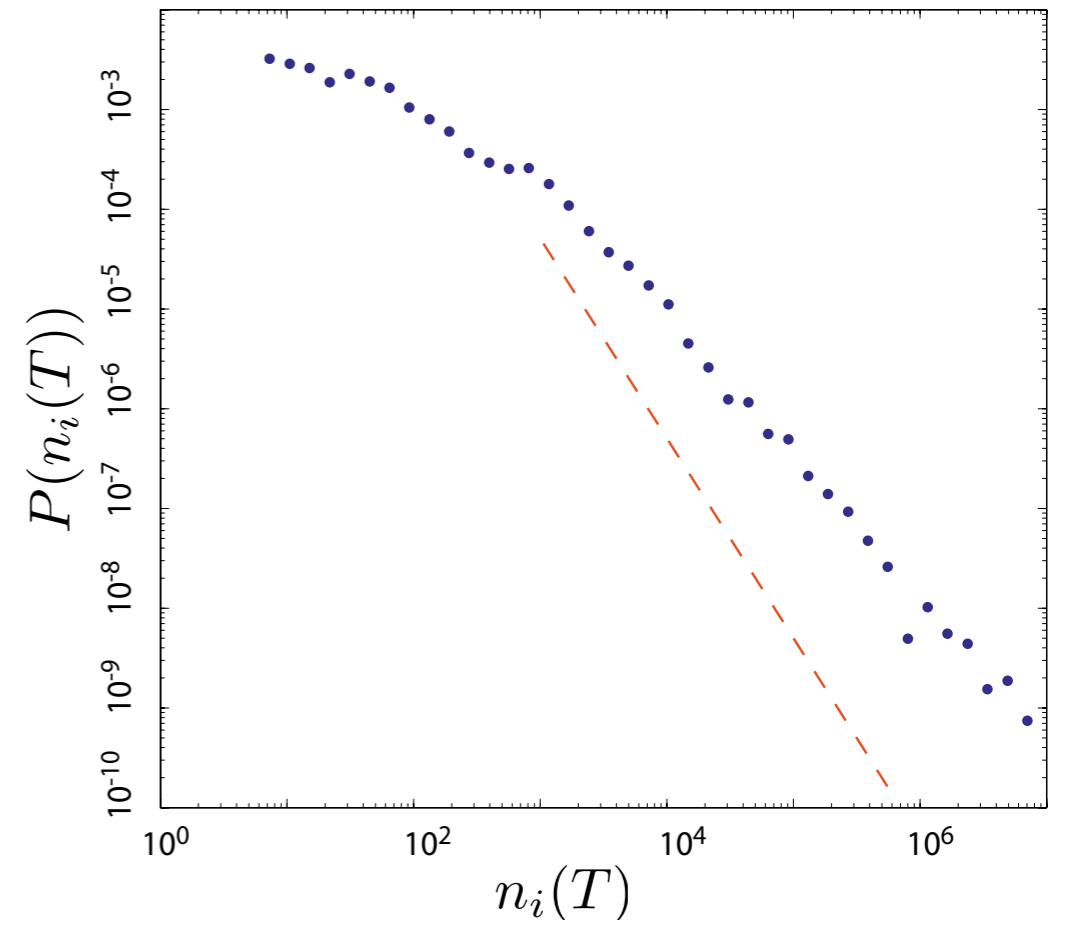n(1)(T) = 12 million
n(10)(T) = 4.6 million
n(100)(T) = 180,000
n(1,000)(T) = 1,300

ni(T) final number of downloads sorted

fat tail - mean value diverges

density distribution for ni(T)
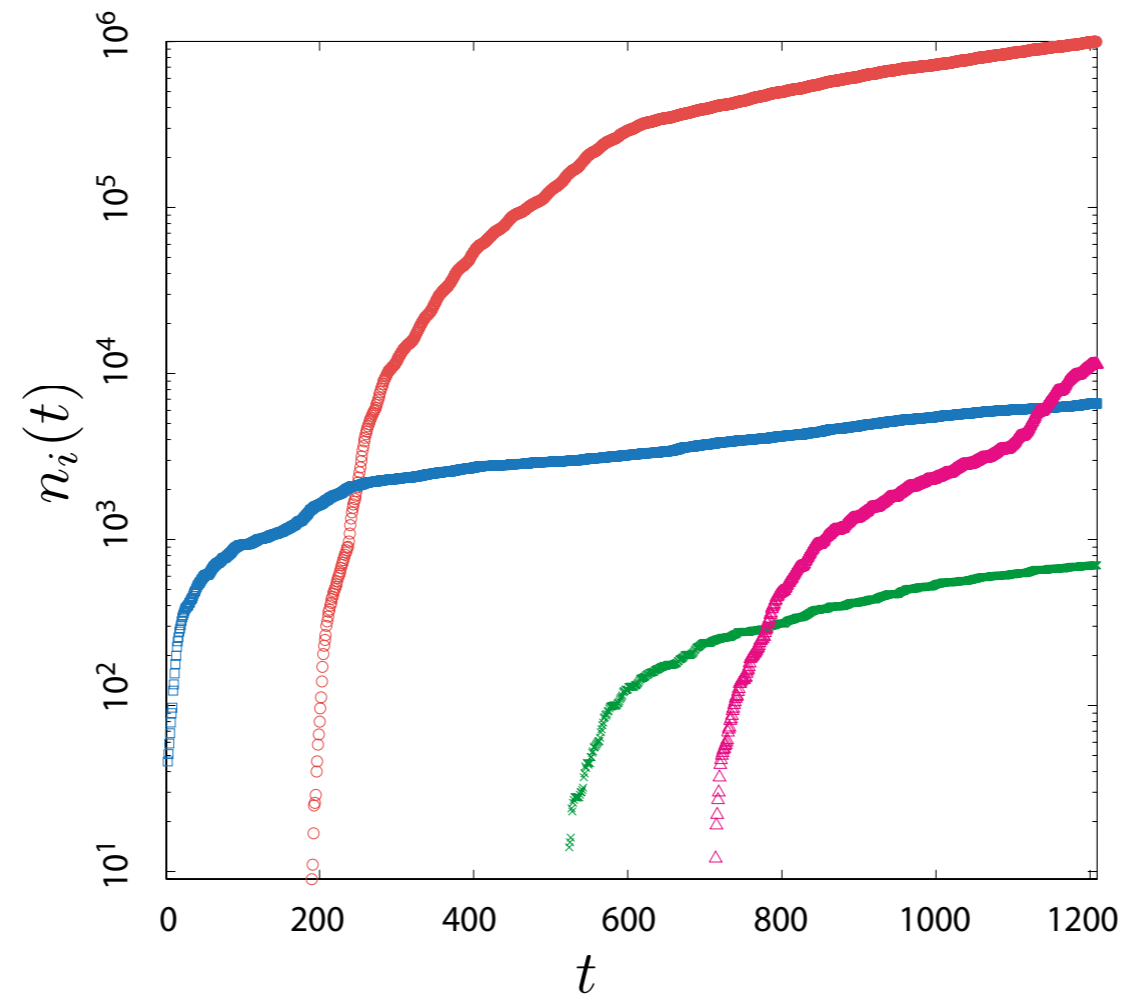
social influence = correlations for fixed app i

Si,j(t) = 0 or 1
user j installs app i at time t

fi(t) jump at time t for app i

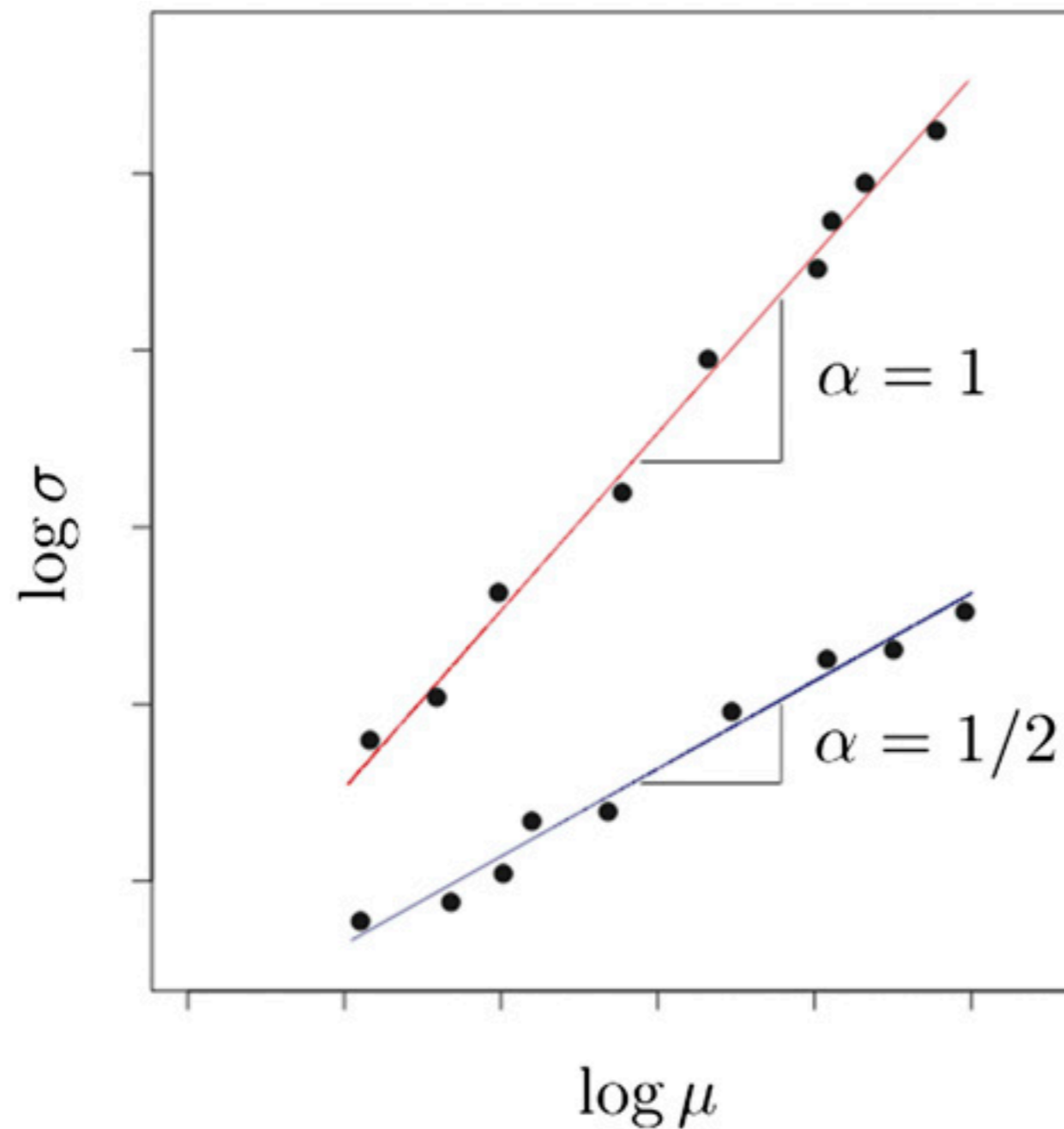$$f_i(t) \equiv n_i(t) - n_i(t-1) = \sum_{j=1}^{N} S_{i,j}(t)$$

for a fixed app i, look at:
- mean jump size mu
- mean deviation sigma from mu

sigma/mu = noise
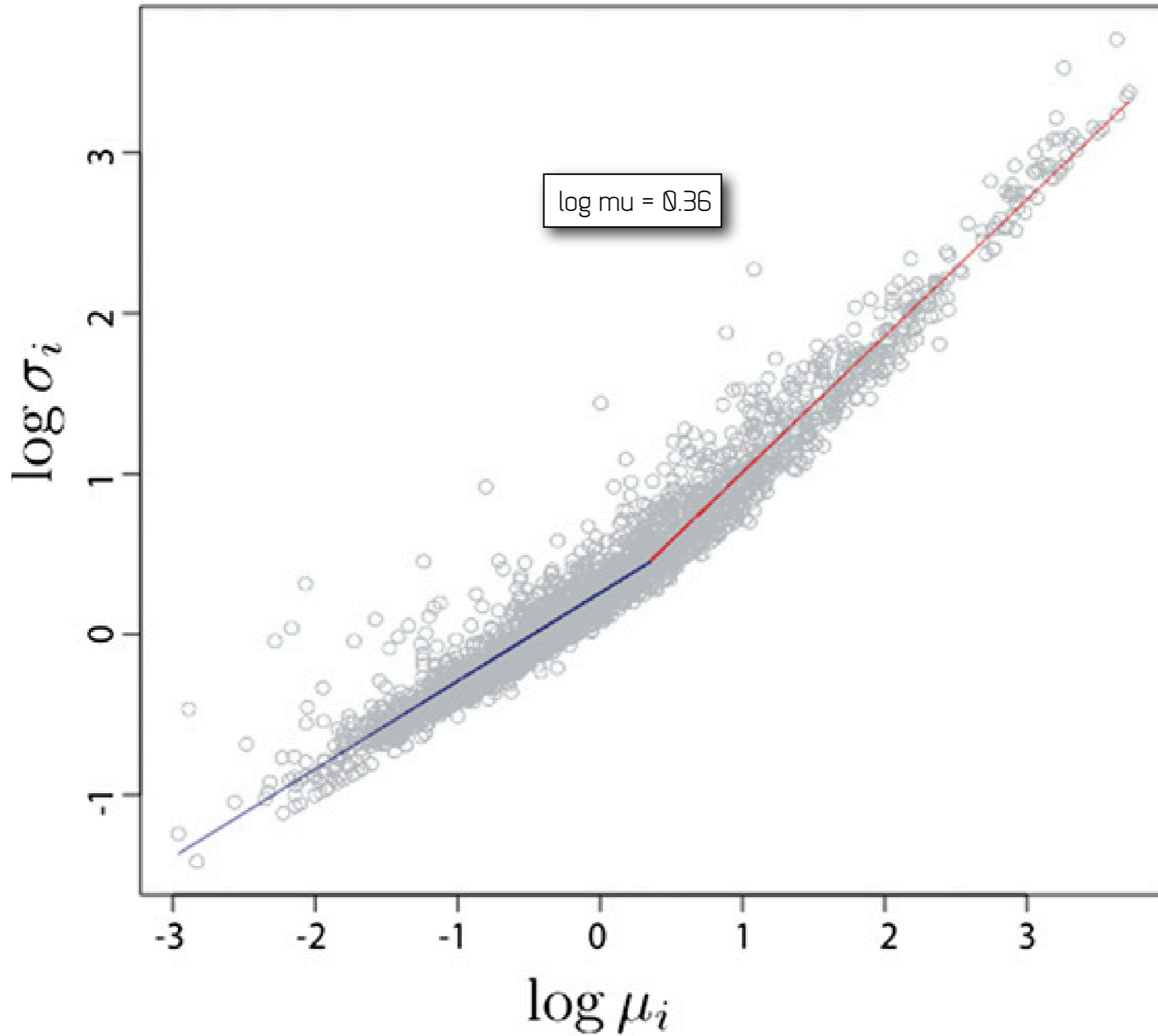measures the social influence - the less noisy the more social

noise is a measure of conflict

$\alpha = 1$

$\alpha = 1/2$

$\log \sigma$

$\log \mu$

log sigma/mu = 1 + ... <- synchronised locked behaviour
log sigma/mu = 1/2 + ... <- independent unconflicted

we vary the population - nb of coin tosses

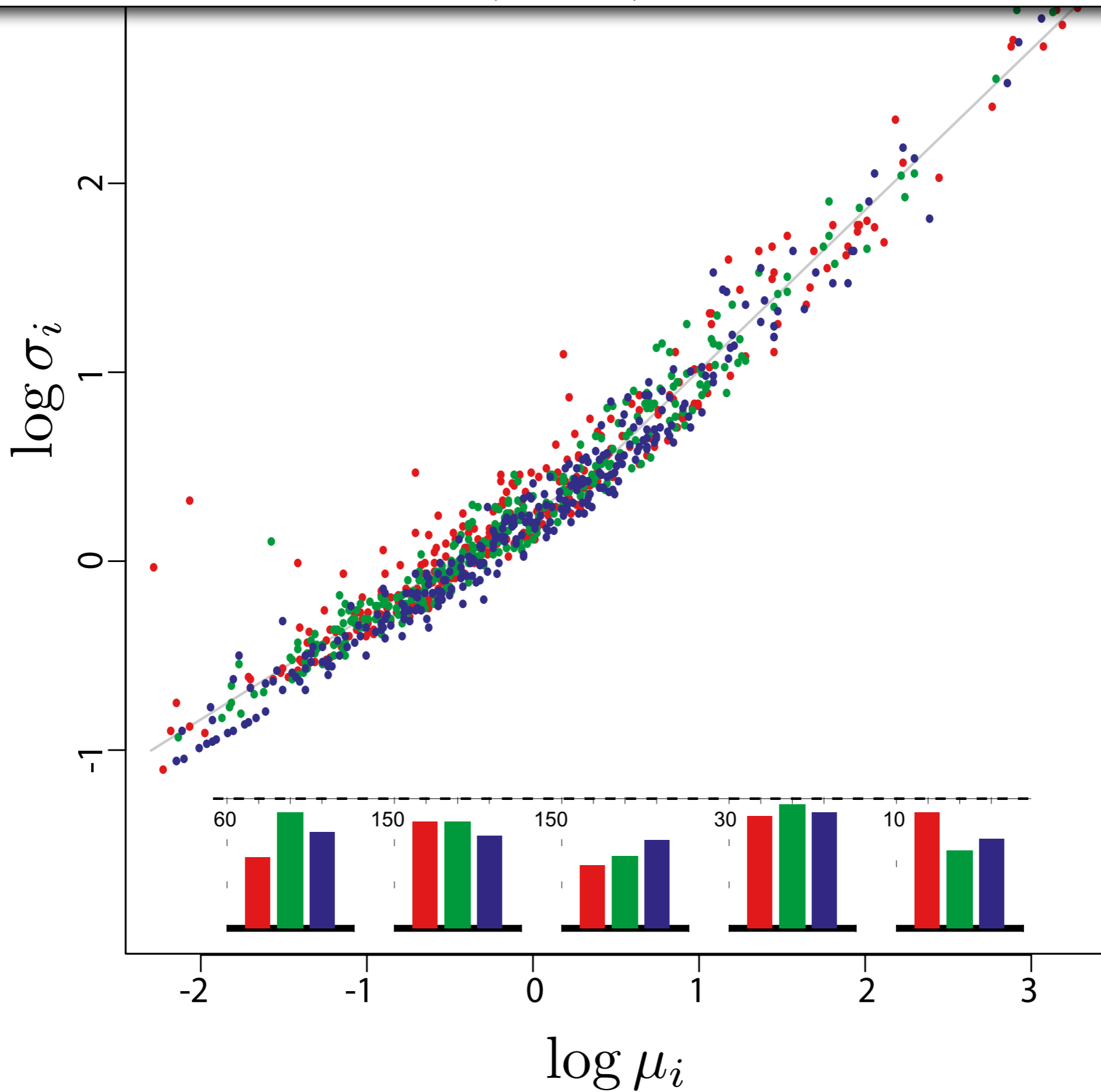note: in FB it is the individual pref that varies as the pop is fixed

log mu = 0.36

what is happening?
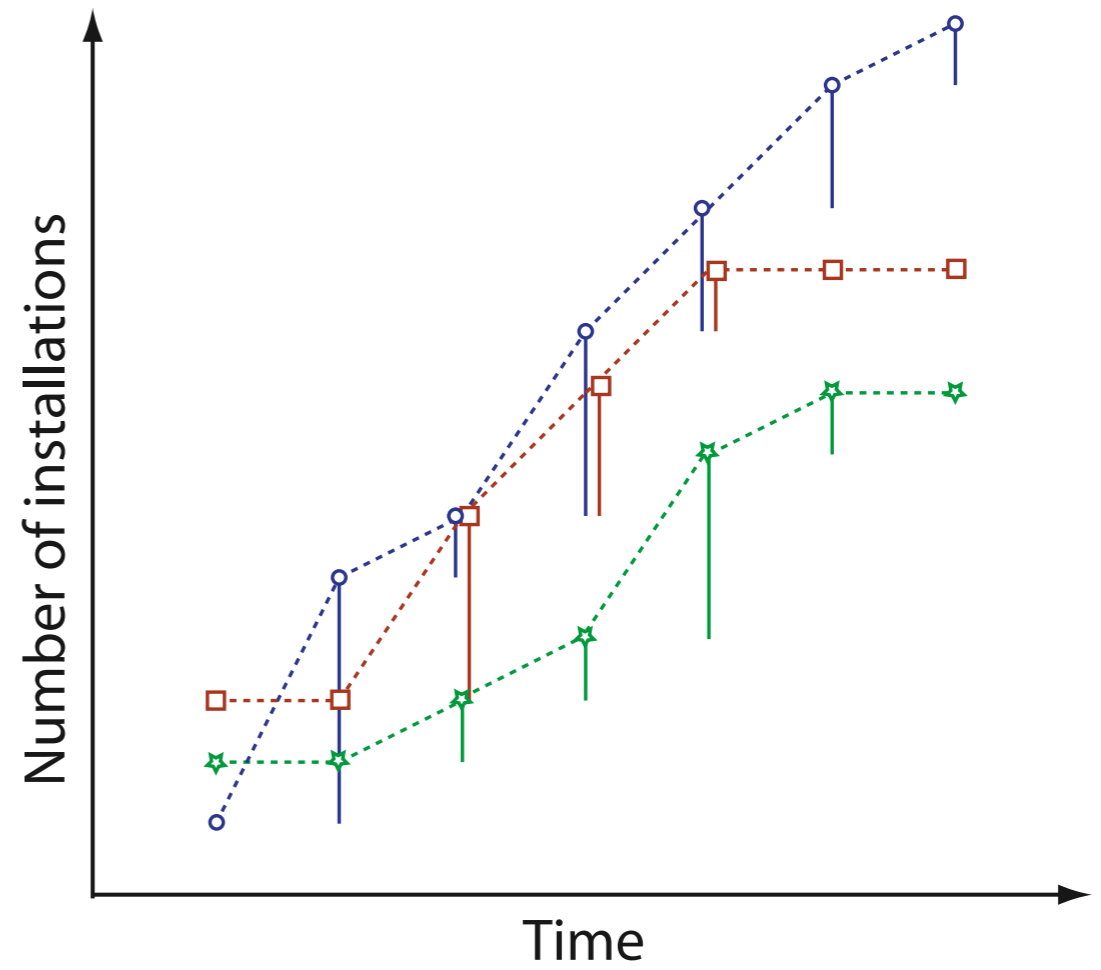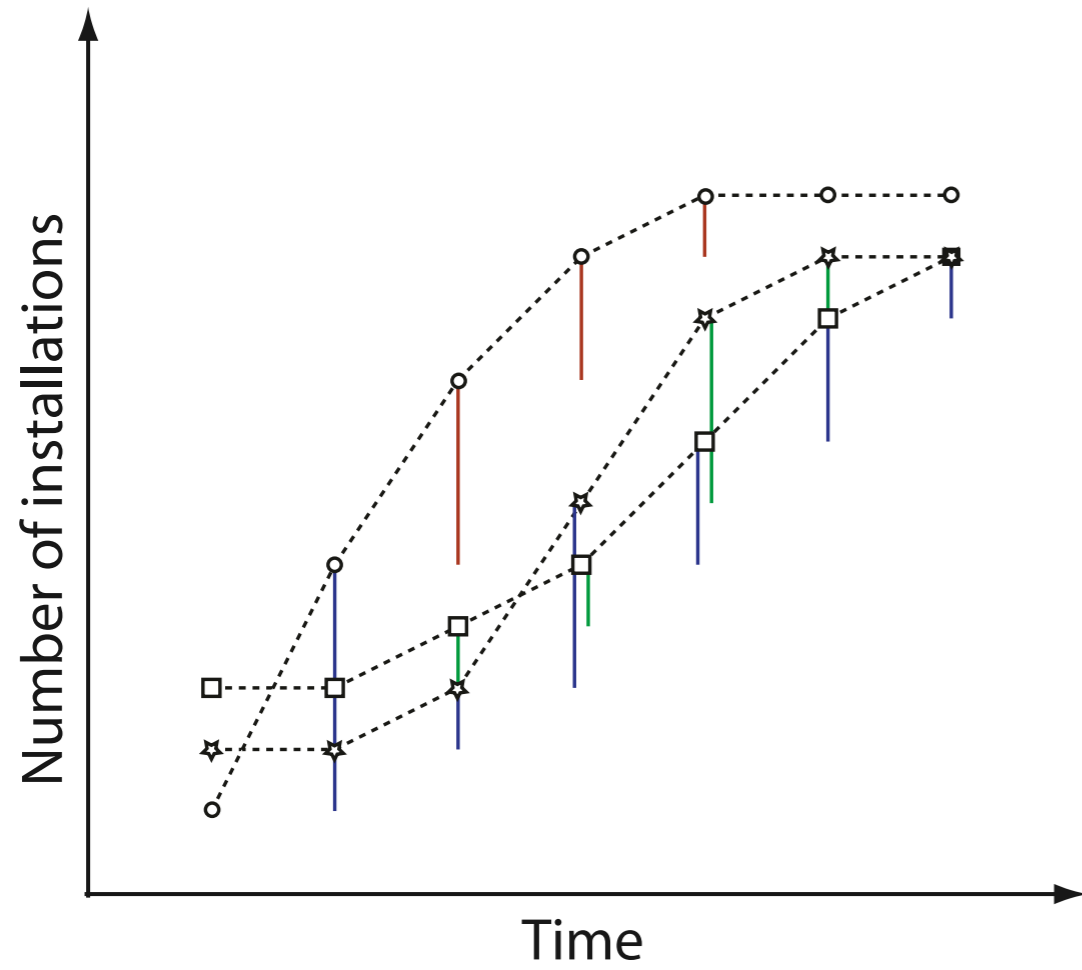is the collective/individual distinction inherent to the system?

is there an aging related factor ... RGB
externalities? eg playing poker with friends
is it just populatrity passing a threshold?
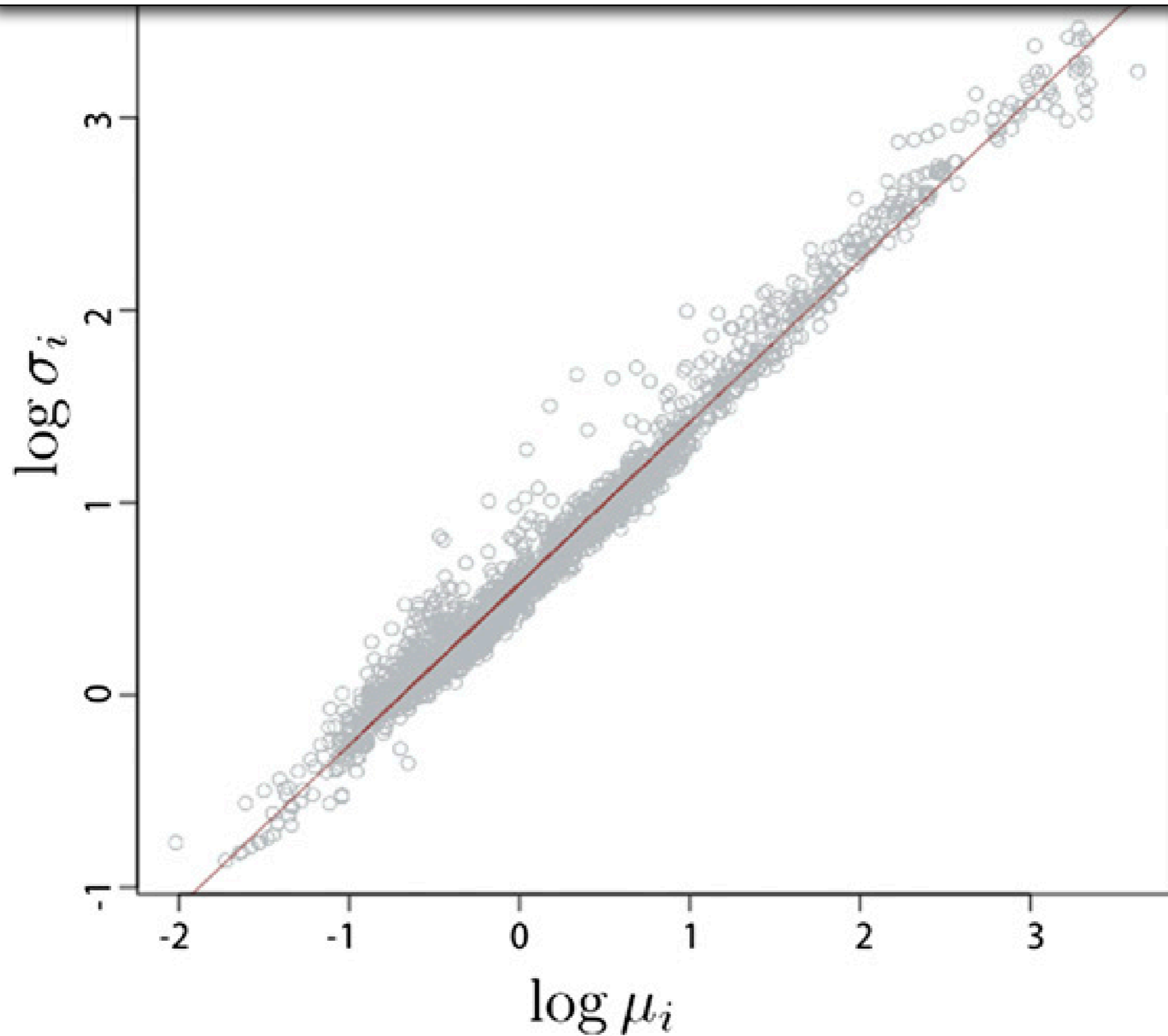
what micromotives are at play here?

aging

synthetic data

synthetic data 2

next ...
tweets n' trades

engineer your own global signal - either for bet (as in the the tweet filter) or propagate
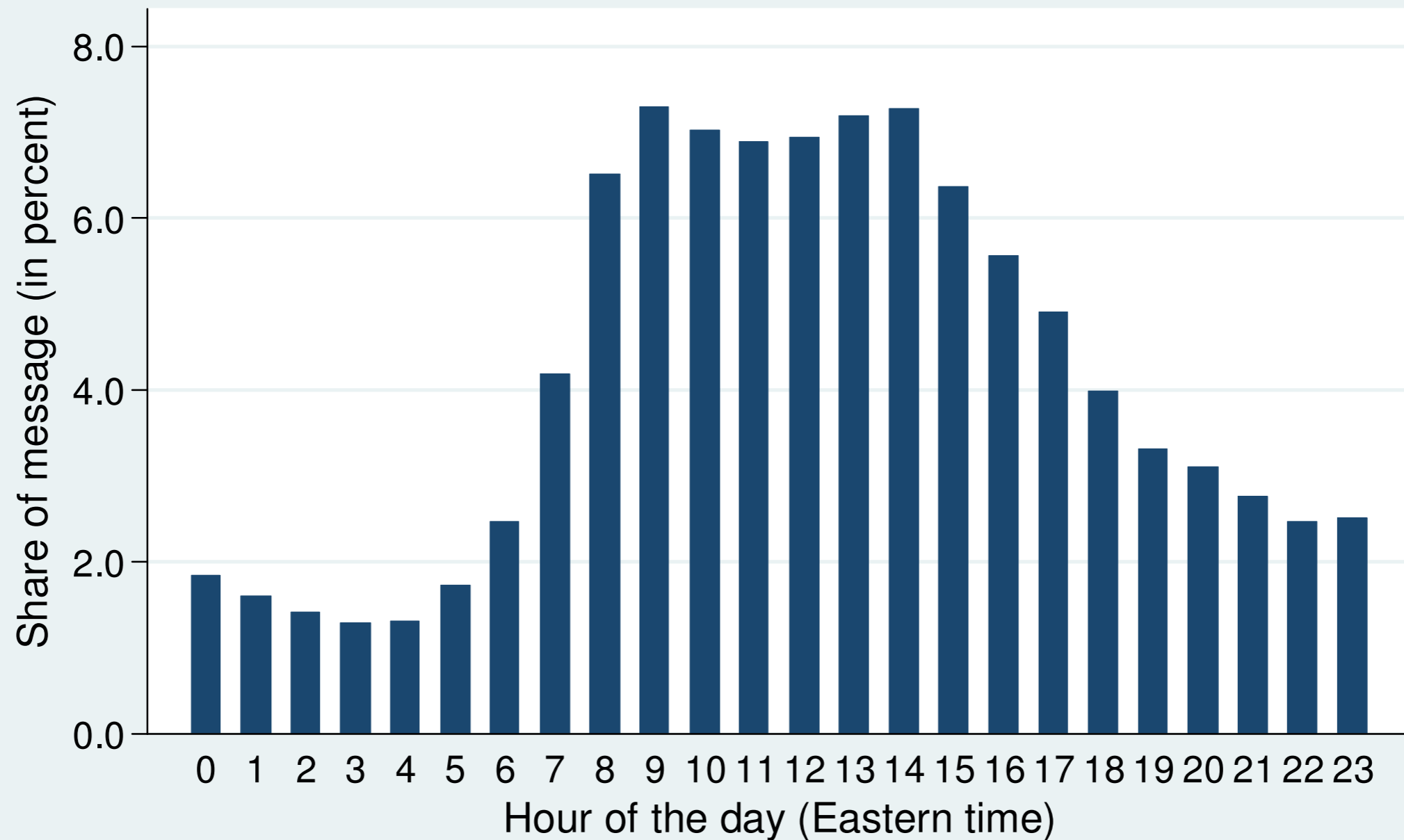
180 M users

tweeter = 90 million messages per day

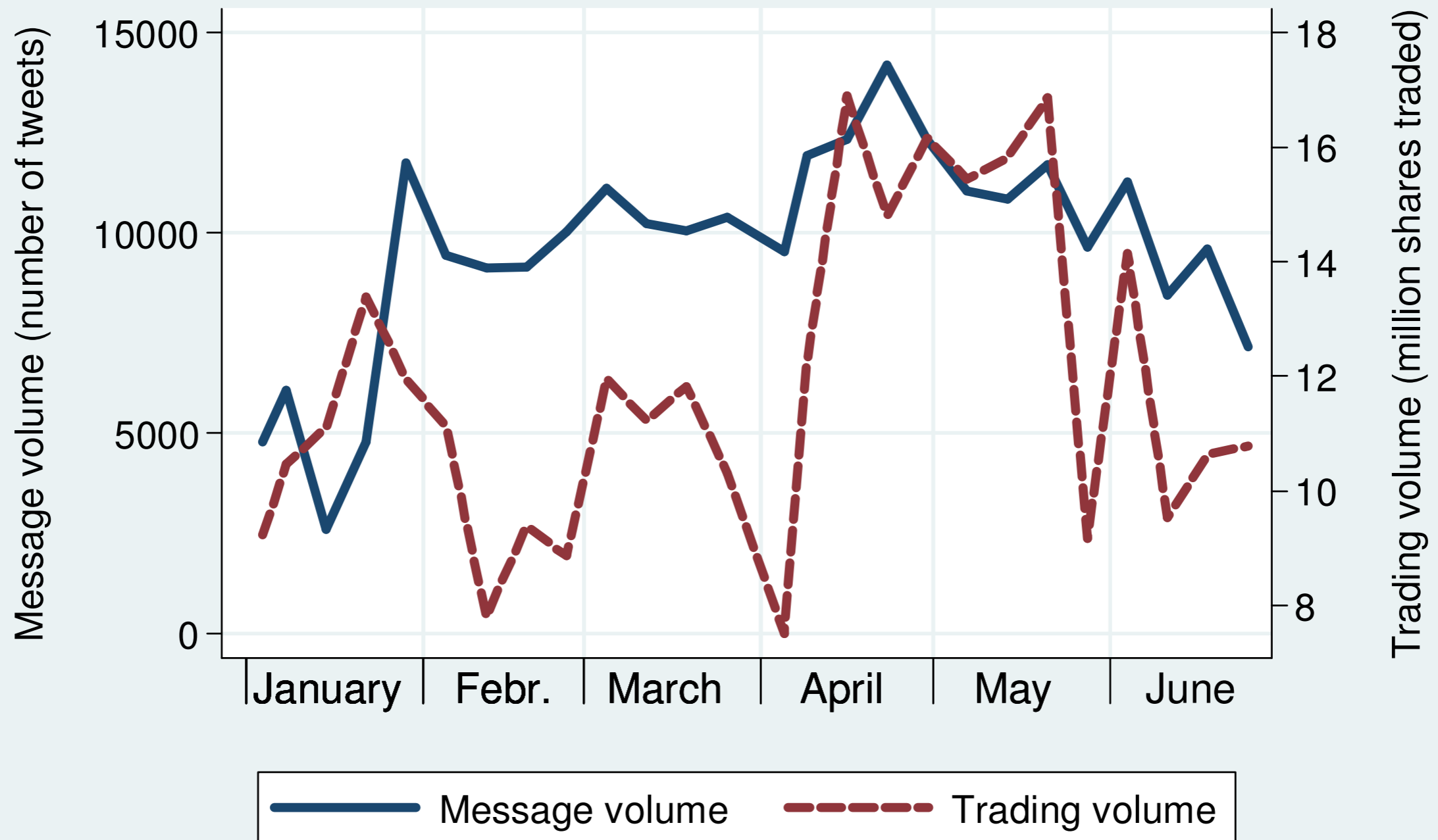follow and search

Stock microblogging

information in stock micro-blogging

Hourly distribution of message volume

Notes: The figure presents the distribution of stock microblogs throughout the day. The graph shows the message volume in the 60 minutes following the indicated hours. We notice a substantial spike in message volume during trading hours indicating that investment professionals are using stock microblogs to exchange trading ideas in real-time. Results are based on our sample of 249,533 stock-related microblogging messages containing the dollar-tagged ticker symbol of an S&P 100 company.

Development of message and trading volume

Message volume (number of tweets): 0, 5000, 10000, 15000

Trading volume (million shares traded): 8, 10, 12, 14, 16, 18

January | Febr. | March | April | May | June

Legend: Message volume — Trading volume

Notes: The figure presents the development of total message volume and trading volume on a weekly basis and shows some notable correlations such as the spike in both measures in the months of April and May.