

Friendship Paradox Redux: Your Friends are More Interesting Than You

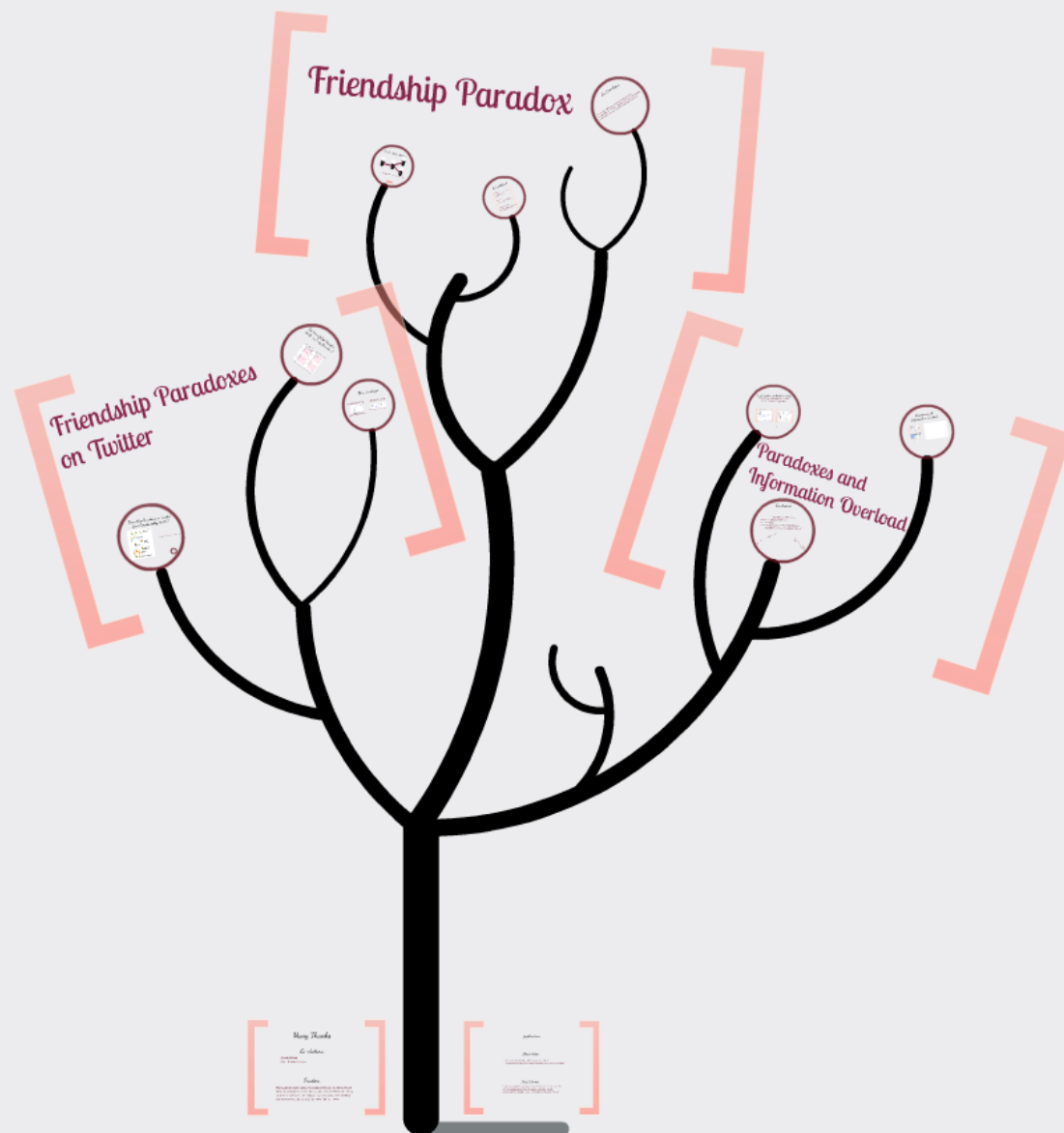
Nathan Hodas

Farshad Kooti

Kristina Lerman

Information Sciences Institute

University of Southern California



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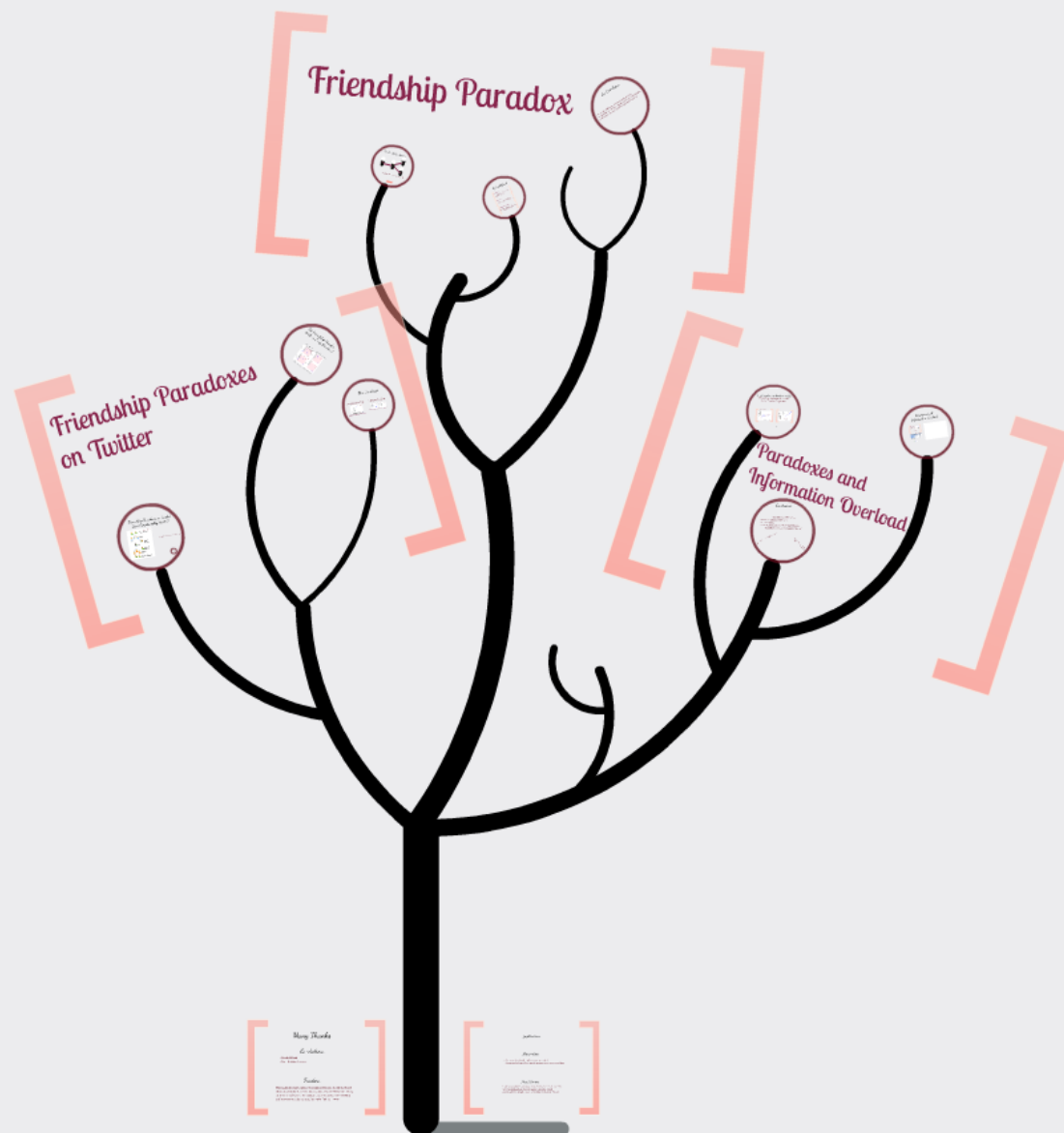
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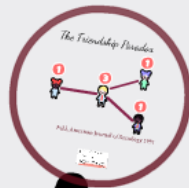
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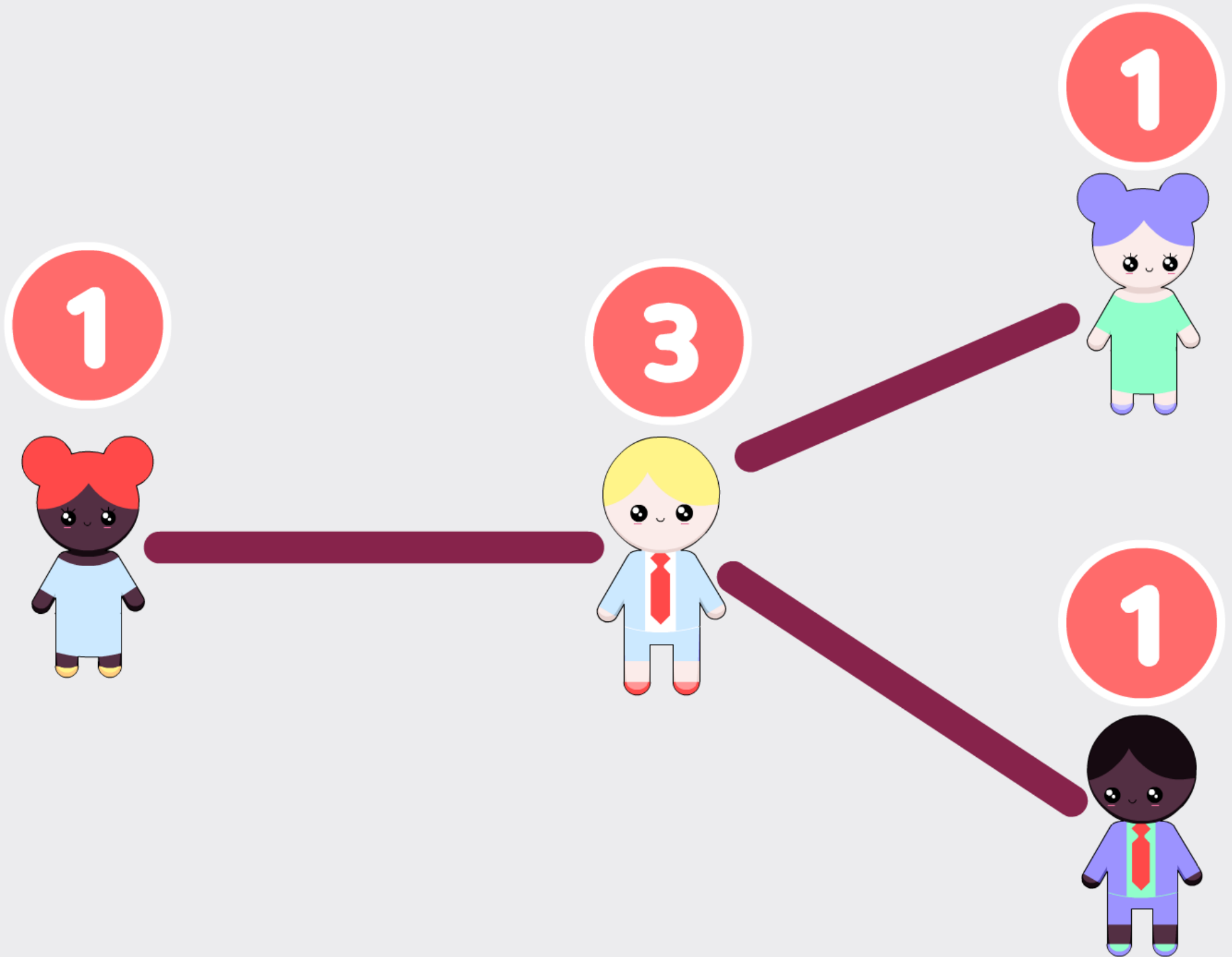
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Friendship Paradox





Feld. American Journal of Sociology 199

ott L. Feld

ate University of New York at Stony Brook

It is reasonable to suppose that individuals use the number of friends that their friends have as one basis for determining whether they, themselves, have an adequate number of friends. This article shows that, if individuals compare themselves with their friends, it is likely that most of them will feel relatively inadequate. Data on

Related Work

friendship paradox

- In "meatspace" (Feld 1991; Zuckerman and Jost 2001)
- Facebook (Ugander et al. 2011)
- Twitter* (Garcia-Herranz et al. 2012)

*One direction only

friends as detectors

- Virtual Outbreaks (Garcia-Herranz et al. 2012)
- Pathogenic Outbreaks (Christakis and Fowler 2010)

social perception and decision making

- Alcohol and Drug Abuse (Tucker et al. 2011; Wolfson 2000)
- Wealth (Morselli and Tremblay 2004; Amuendo-Dorantes 2007)
- Extraversion (Pollet et al. 2011; Querca et al. 2012)

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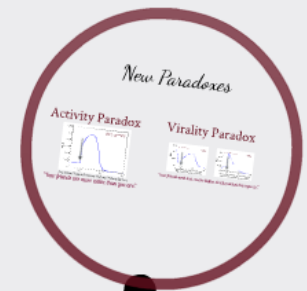
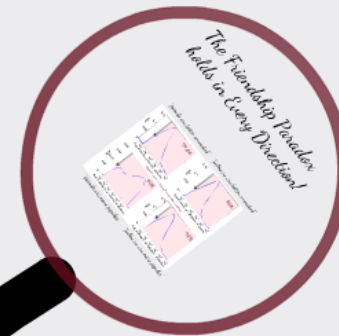
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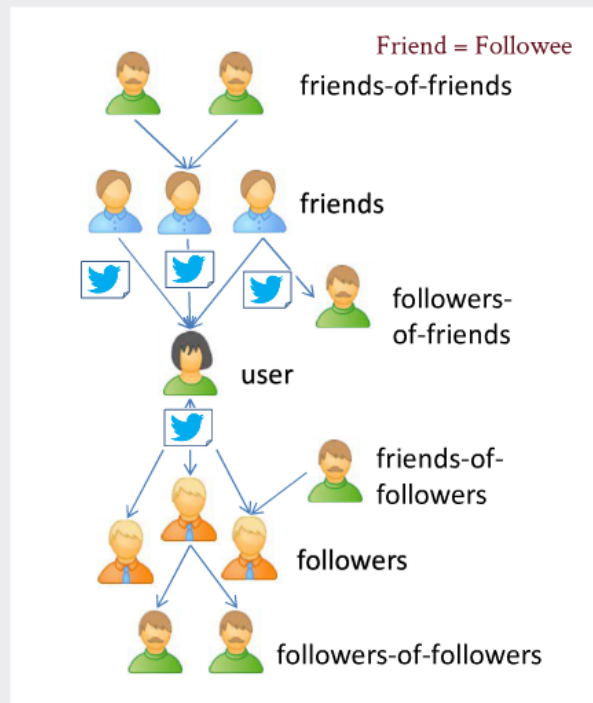
Our Contribution

- Confirm and Explore the Friendship Paradox on Twitter
- Demonstrate New Paradoxes: Activity Paradox and Virality Paradox
- Implications: Information Overload and Altered Propagation

Friendship Paradoxes on Twitter



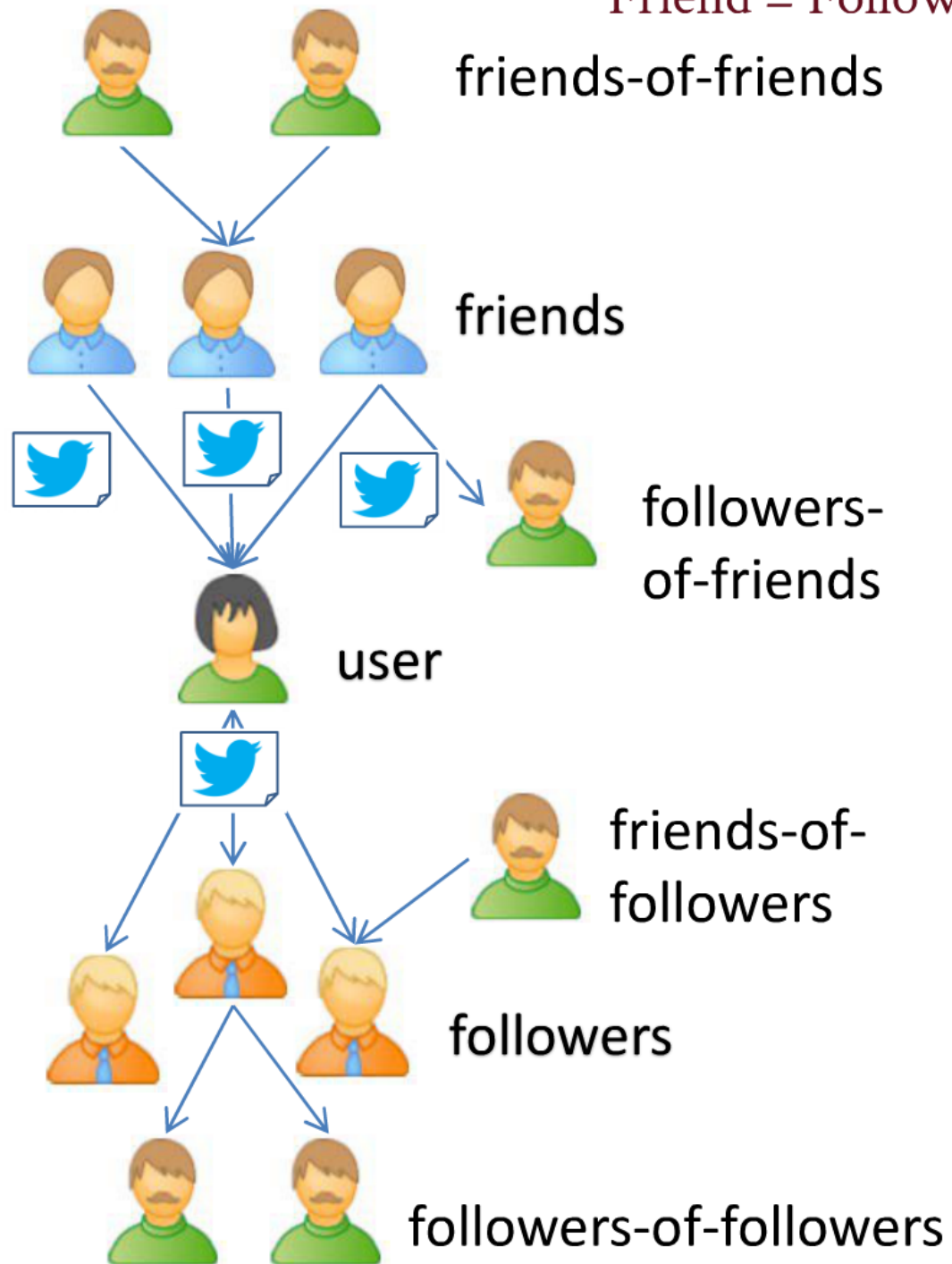
Friendship Paradoxes on Twitter: Does Directionality Matter?



Does the Friendship Paradox hold on Twitter in all directions?



Friend = Followee



Does the Friendship Paradox hold on Twitter in all directions?

476 Million Tweets (Random Sample of Firehose) from June to December 2009
(Yang and Leskovec 2011)

+

Follower Graph of 40 Million Users as of Summer 2009 (Kwak et al. 2010)



5.8 Million Users w/ ~200 Million links



Users active over a two month window

3.4 Million Users sending 37 Million Tweets

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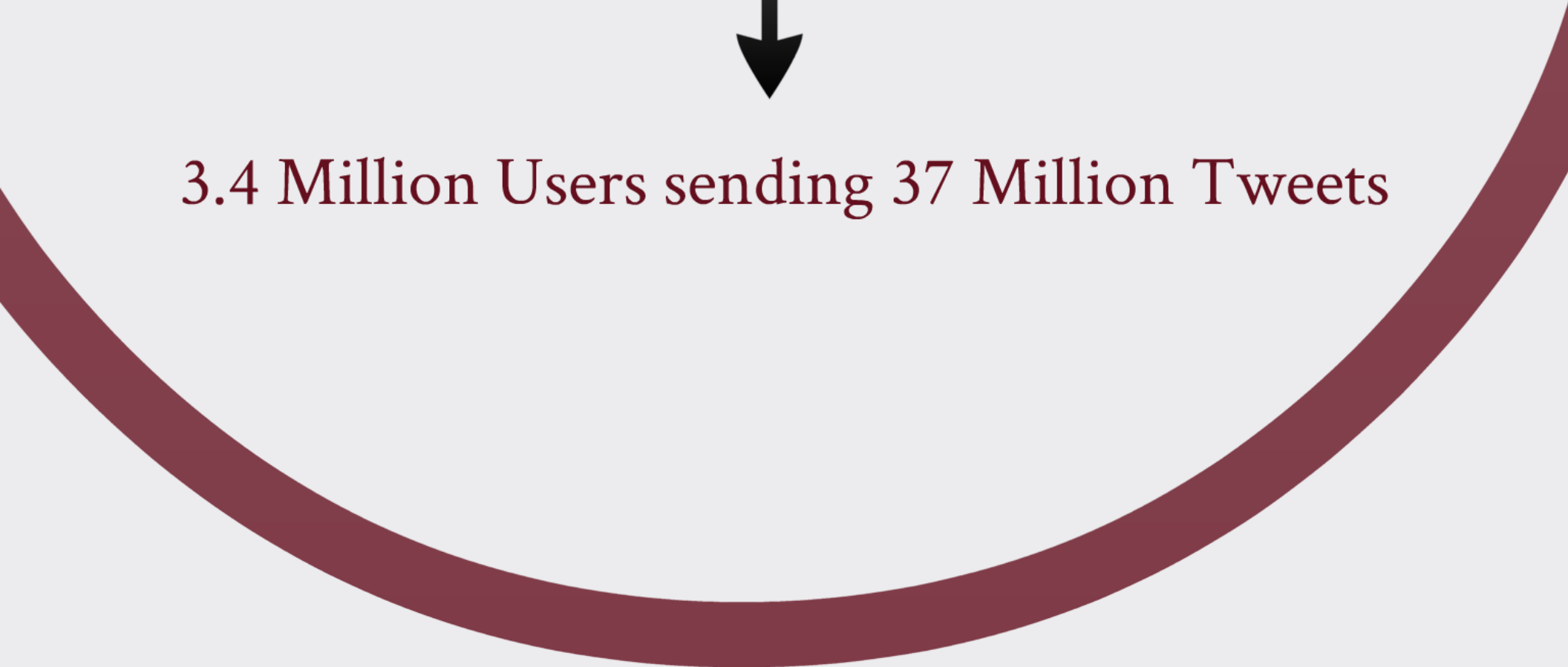


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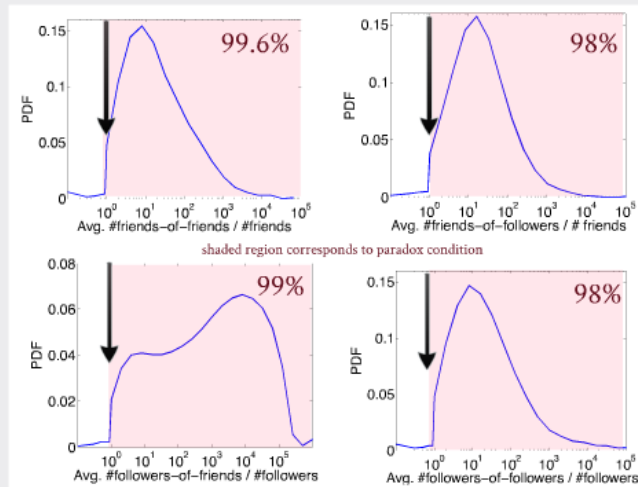
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The Friendship Paradox holds in Every Direction!

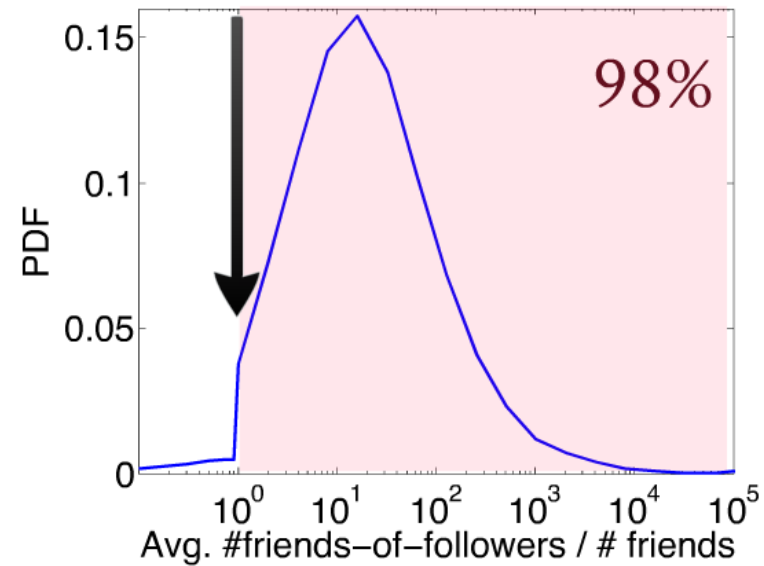
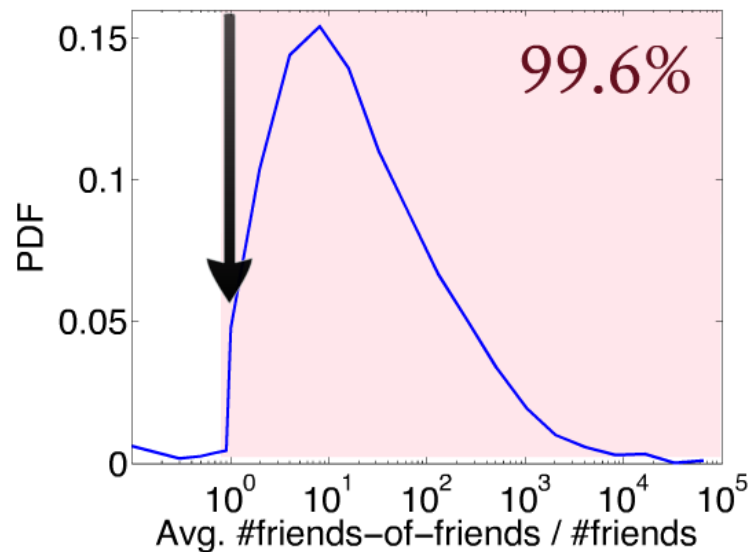
"friends are better connected" *"followers are better connected"*



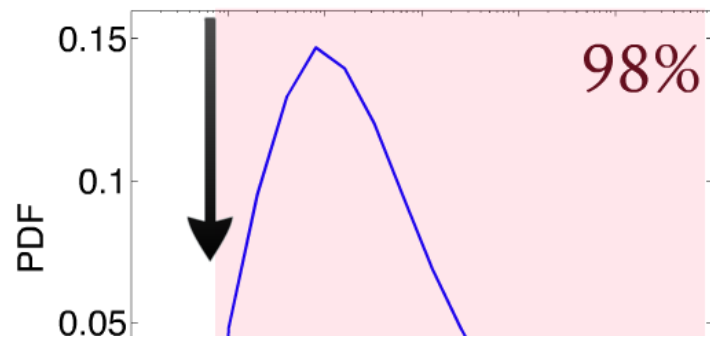
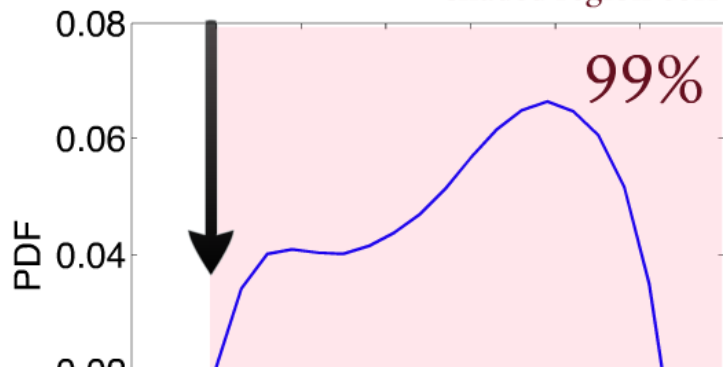
"friends are more popular" *"followers are more popular"*

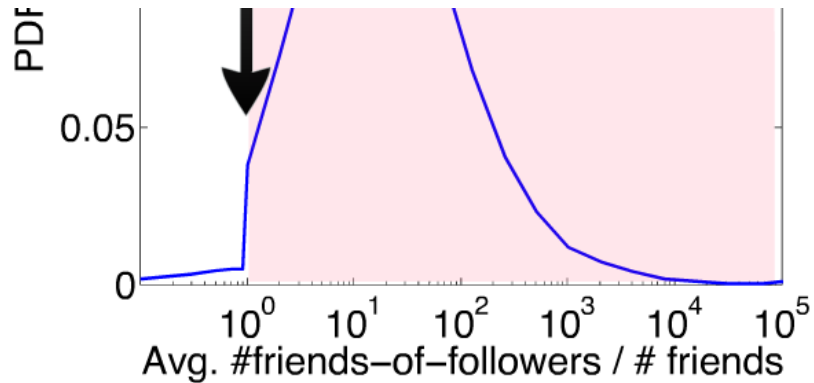
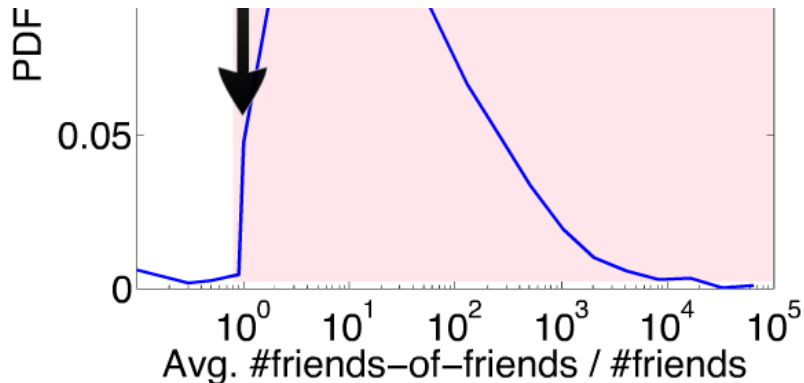
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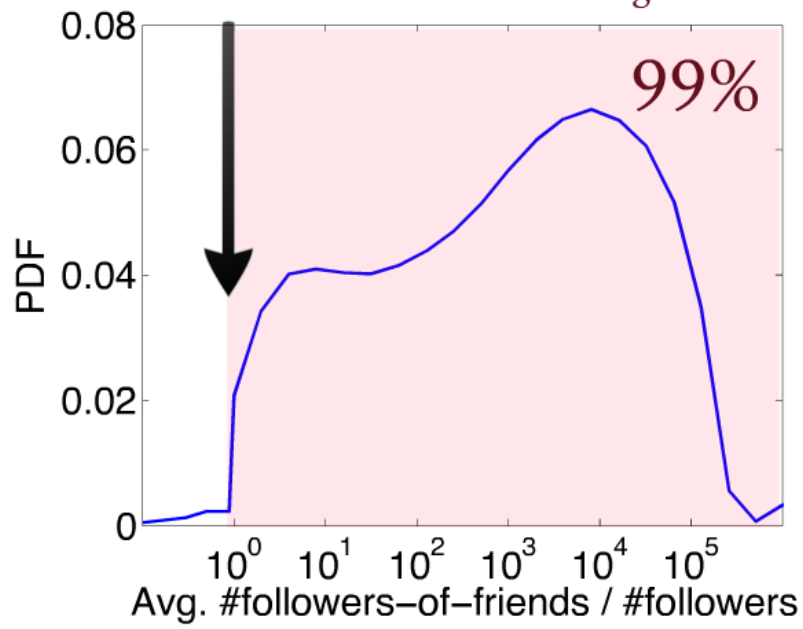


shaded region corresponds to paradox condition

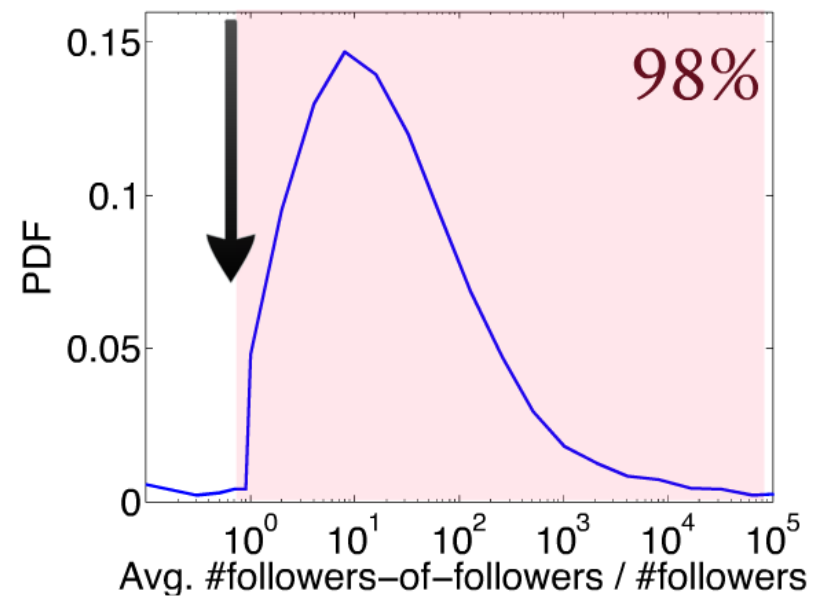




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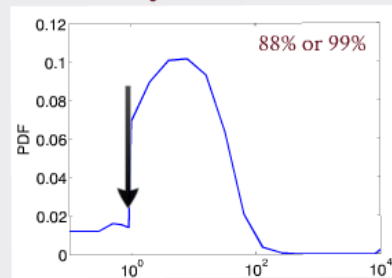
"friends are more popular"



"followers are more popular"

New Paradoxes

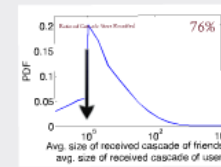
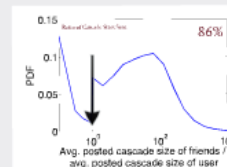
Activity Paradox



Avg. Posted Tweets Per Friend / Posted Tweets by User

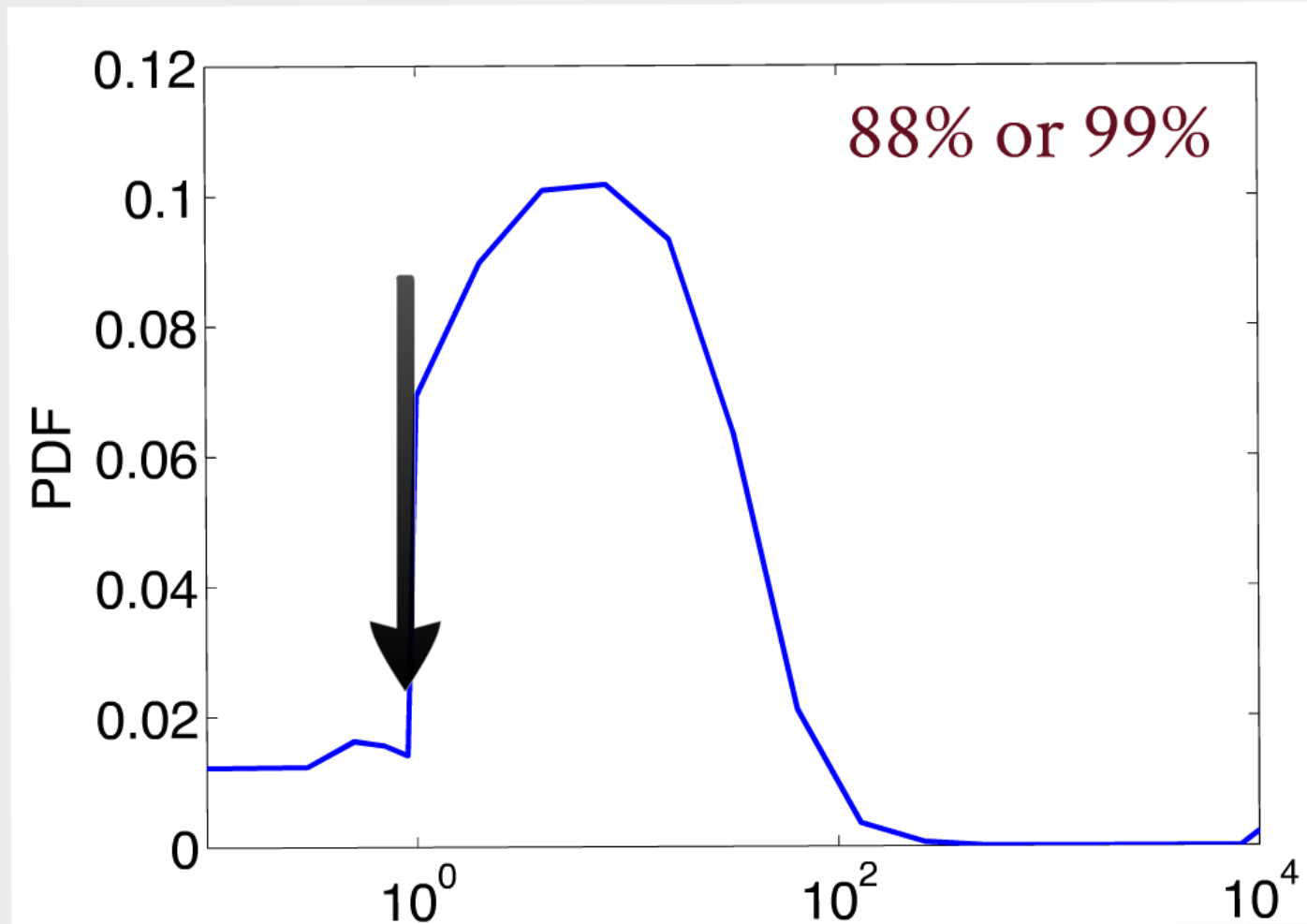
"Your friends are more active than you are."

Virality Paradox



"Your friends send and receive higher virality content than you do."

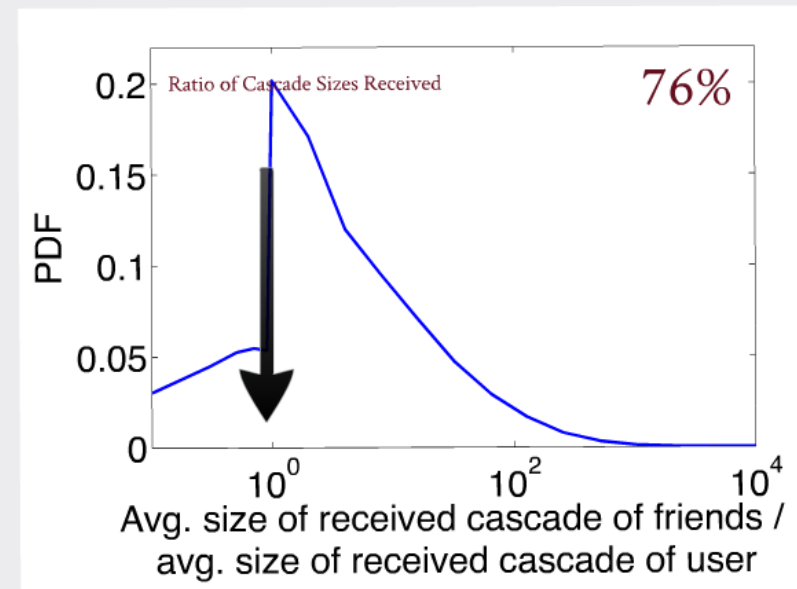
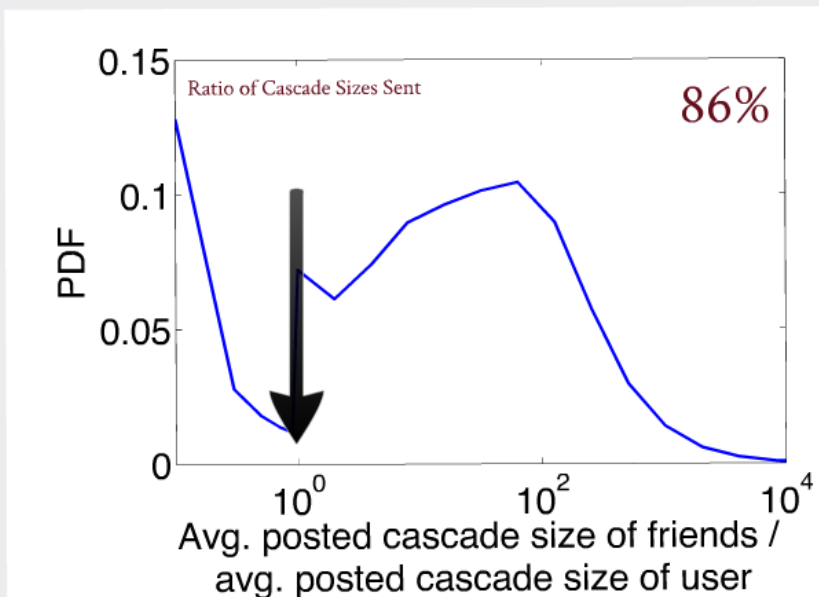
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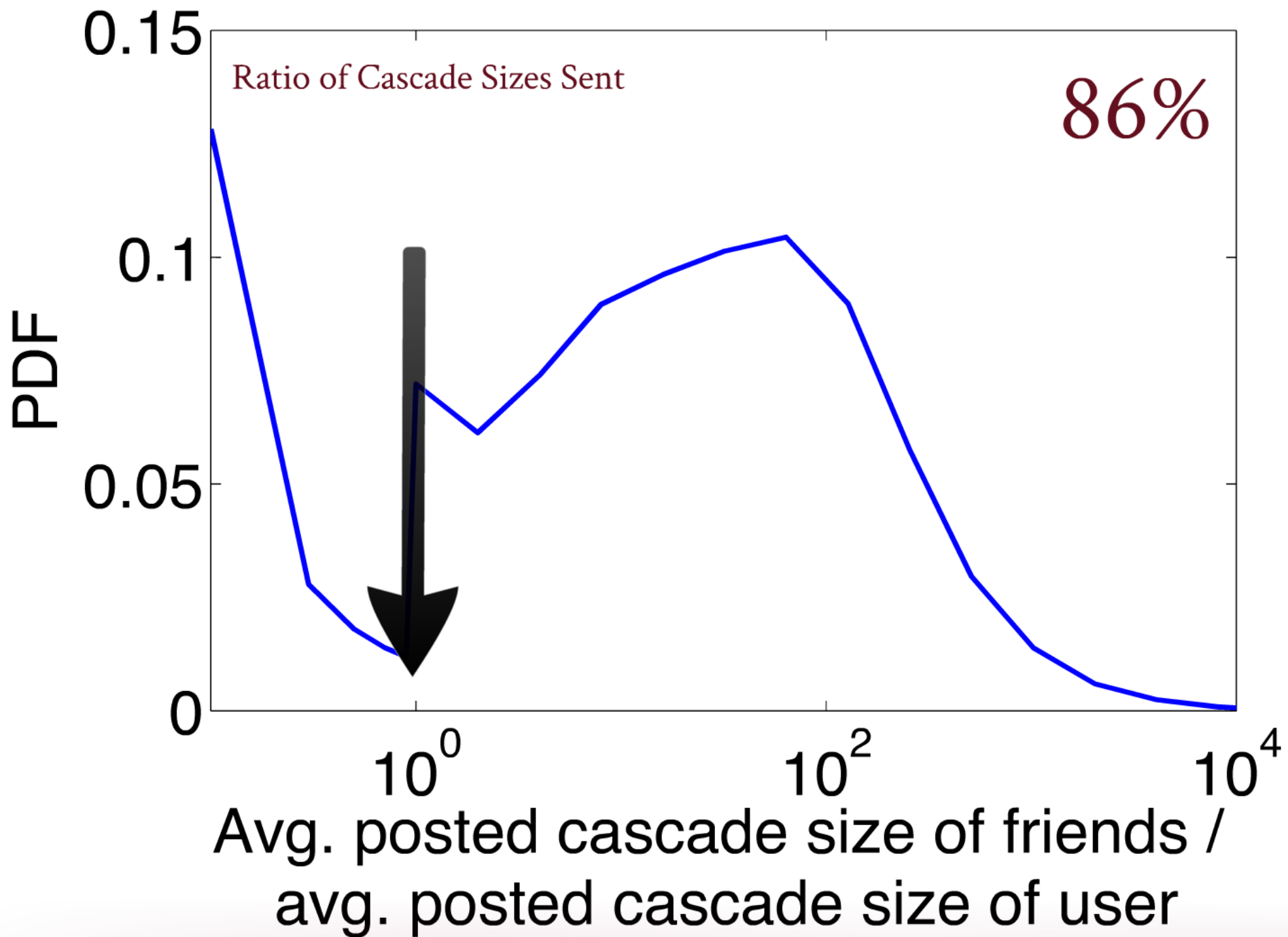
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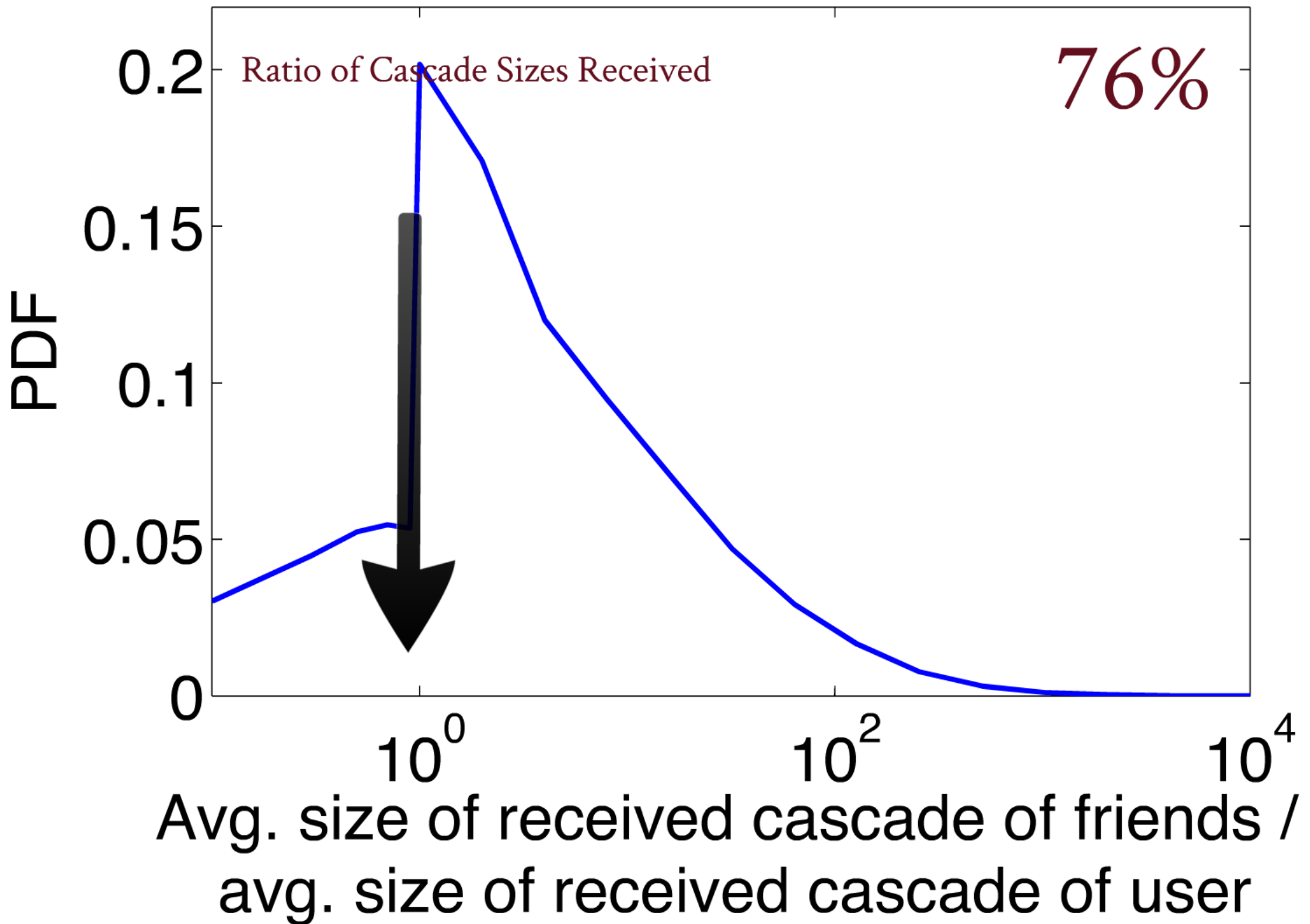
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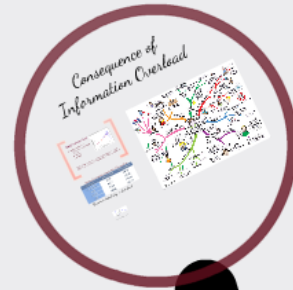
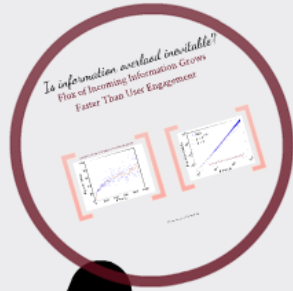
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Paradoxes and Information Overload

Conclusions

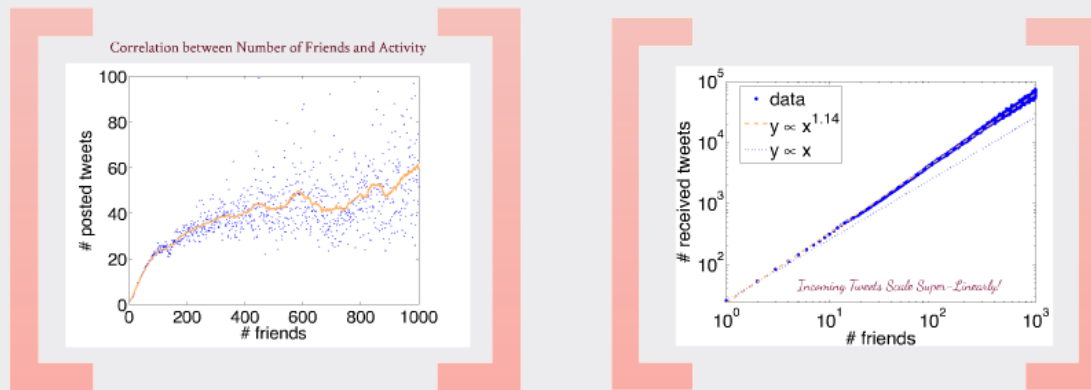
Your Friends and Followers...

- have more Friends and Followers...
- are more Active,
- and send and create more Viral content than you.

"Your friends are more interesting than you are!"

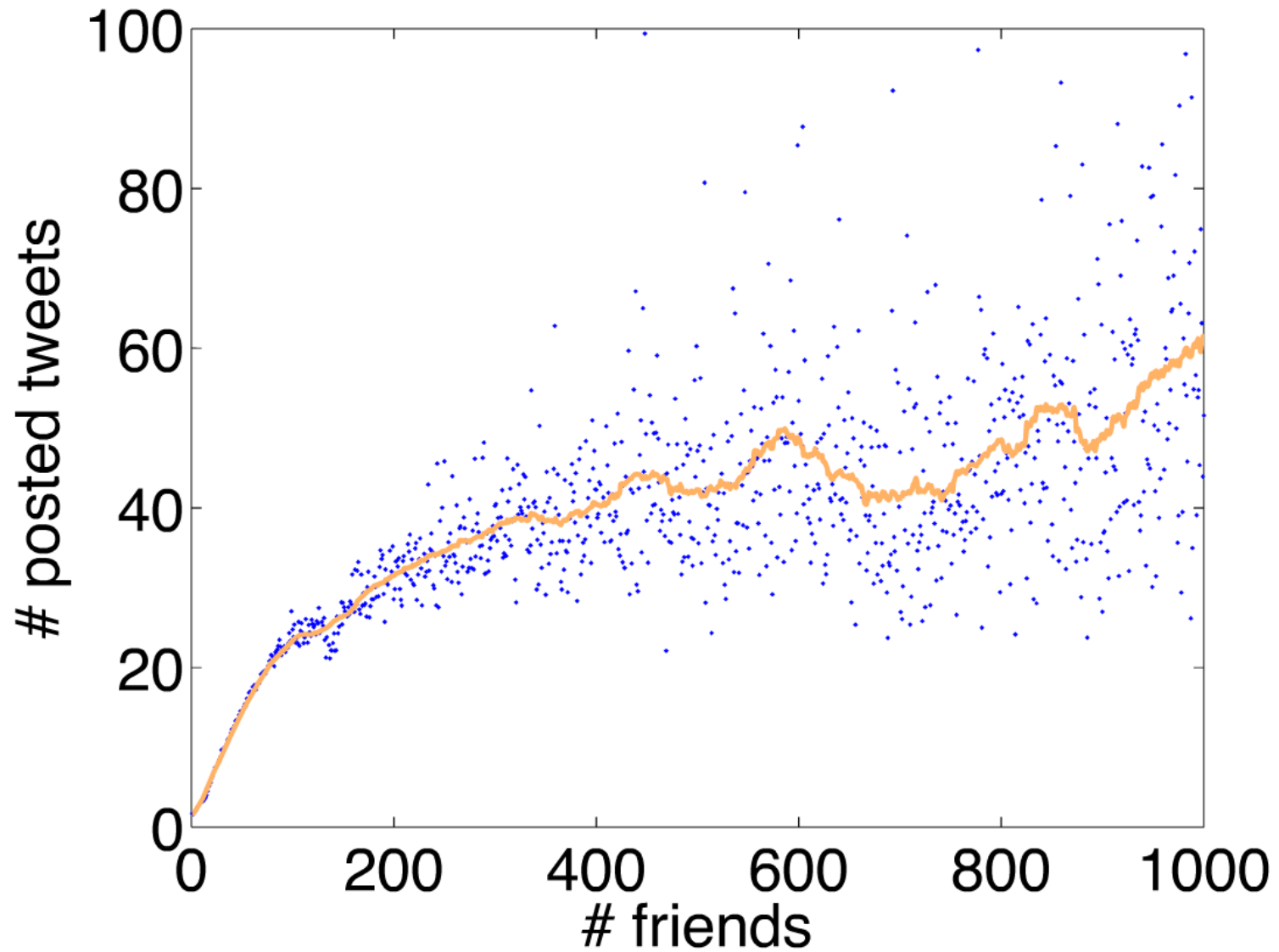
Is information overload inevitable?

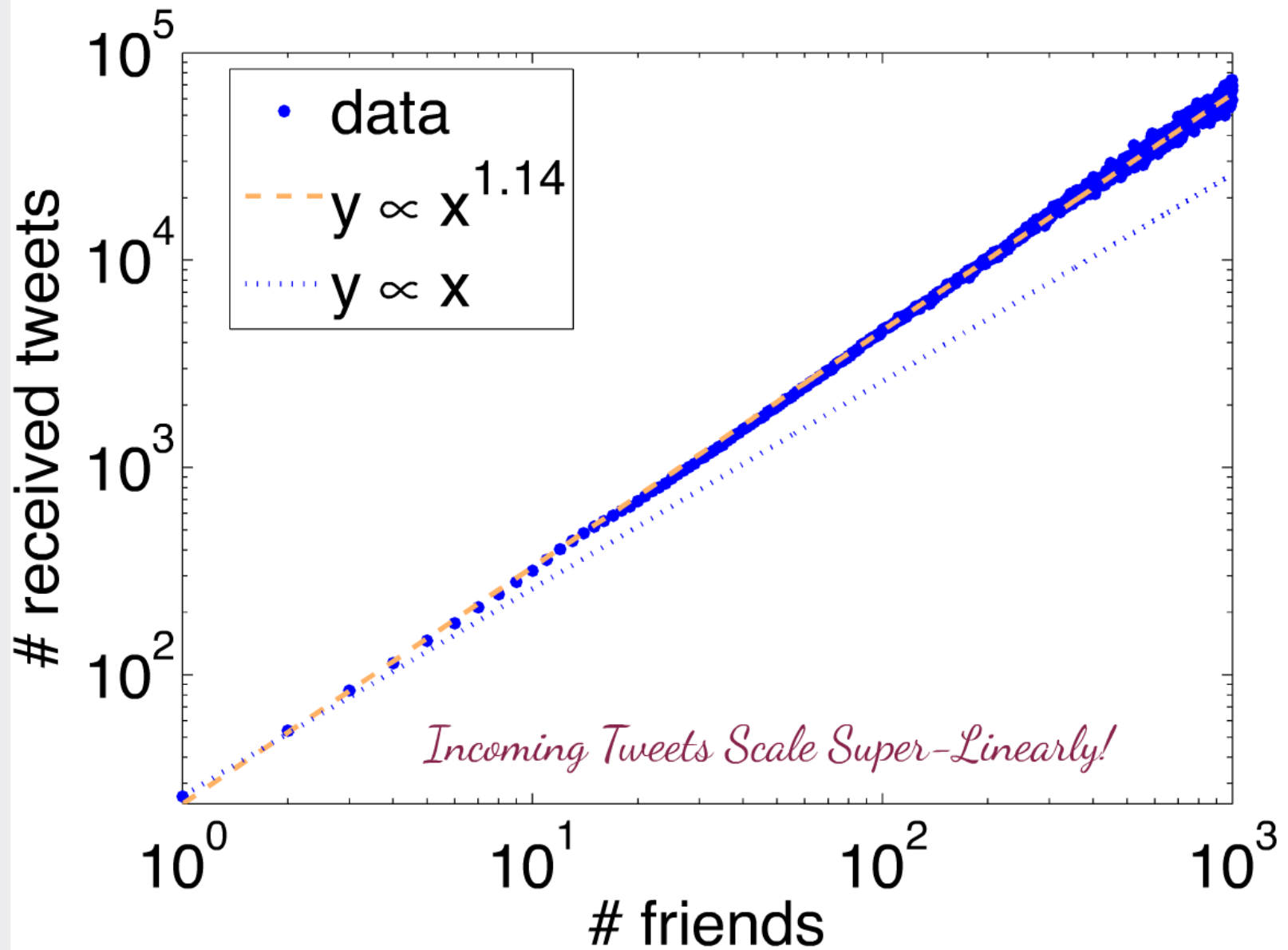
Flux of Incoming Information Grows Faster Than User Engagement



Paradox worsens with connectivity

Correlation between Number of Friends and Activity





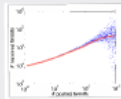
Paradox worsens with connectivity

Consequence of Information Overload

Finding "Overloaded Users"

Run users into activity levels:

- < 5 Tweets over 2-month window
- 5-19 Tweets
- 20-59 Tweets
- > 60 Tweets

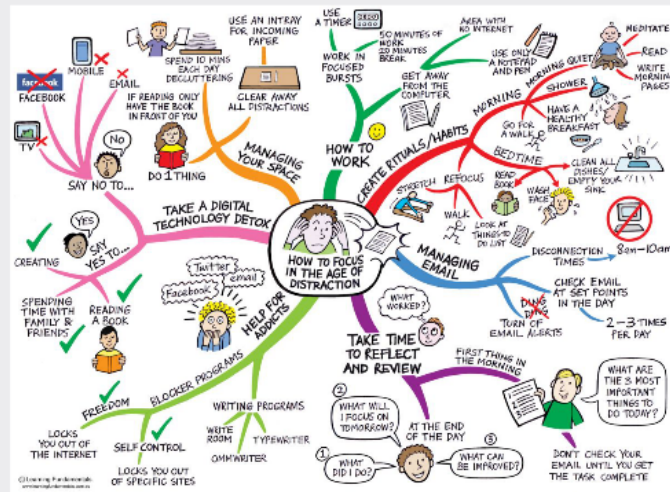


- Top 33% of users in each category, based on received tweets, we call "Overloaded"
- Bottom 33% of users in each category, based on received tweets, we call "Underloaded"

Mean of average size of received URL cascades

Category	Underloaded	Overloaded
< 5 Tweets	12.56	104.96
5-19	40.78	132.94
20-59	119.75	160.99
> 60	145.44	202.86

Dilemma: Popularity vs. Overload





HOW TO FOCUS IN THE AGE OF DISTRACTION

HOW TO WORK

- USE A TIMER
- 50 MINUTES OF WORK 20 MINUTES BREAK
- WORK IN FOCUSED BURSTS
- GET AWAY FROM THE COMPUTER
- AREA WITH NO INTERNET

CREATE RITUALS/HABITS

MORNING

- USE ONLY A NOTEPAD AND PEN
- MEDITATE
- READ
- WRITE MORNING PAGES
- SHOWER
- HAVE A HEALTHY BREAKFAST
- GO FOR A WALK

BEDTIME

- STRETCH
- REFOCUS
- WALK
- LOOK AT THINGS TO DO LIST
- READ BOOK
- WASH FACE
- CLEAN ALL DISHES/EMPTY YOUR SINK

MANAGING EMAIL

- DISCONNECTION TIMES 8am-10am
- CHECK EMAIL AT SET POINTS IN THE DAY
- 2-3 TIMES PER DAY
- TURN OFF EMAIL ALERTS
- WHAT WORKED?

TAKE TIME TO REFLECT AND REVIEW

FIRST THING IN THE MORNING

WHAT ARE THE 3 MOST IMPORTANT THINGS TO DO TODAY?

AT THE END OF THE DAY

- WHAT DID I DO?
- WHAT WILL I FOCUS ON TOMORROW?
- WHAT CAN BE IMPROVED?

DON'T CHECK YOUR EMAIL UNTIL YOU GET THE TASK COMPLETE

MANAGING YOUR SPACE

- USE AN INTRAY FOR INCOMING PAPER
- CLEAR AWAY ALL DISTRACTIONS
- SPEND 10 MINS EACH DAY DECLUTTERING
- IF READING ONLY HAVE THE BOOK IN FRONT OF YOU
- DO 1 THING

TAKE A DIGITAL TECHNOLOGY DETOX

- SAY NO TO... MOBILE, EMAIL, FACEBOOK, TV
- SAY YES TO... CREATING, SPENDING TIME WITH FAMILY & FRIENDS, READING A BOOK

HELP FOR ADDICTS

- BLOCKER PROGRAMS
- WRITE ROOM
- OMMWRITER
- TPEWRITER
- LOCKS YOU OUT OF THE INTERNET
- SELF CONTROL
- LOCKS YOU OUT OF SPECIFIC SITES

Finding "Overloaded Users"

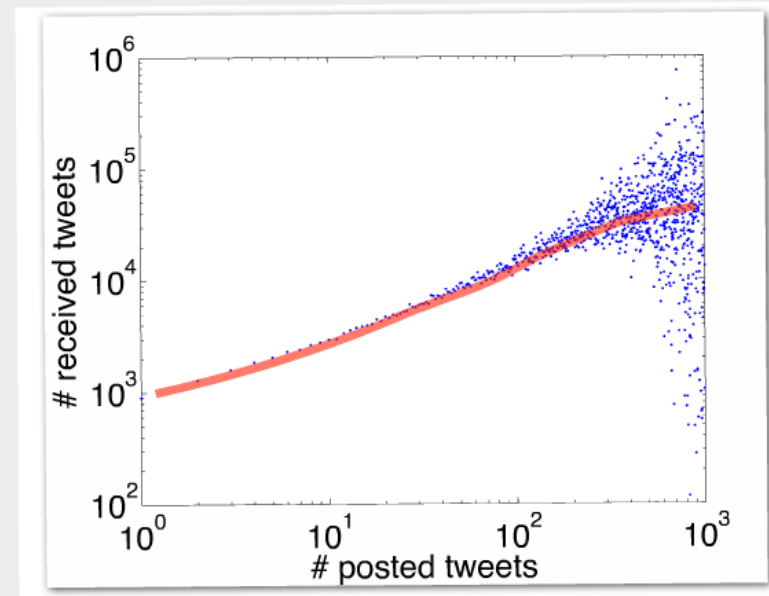
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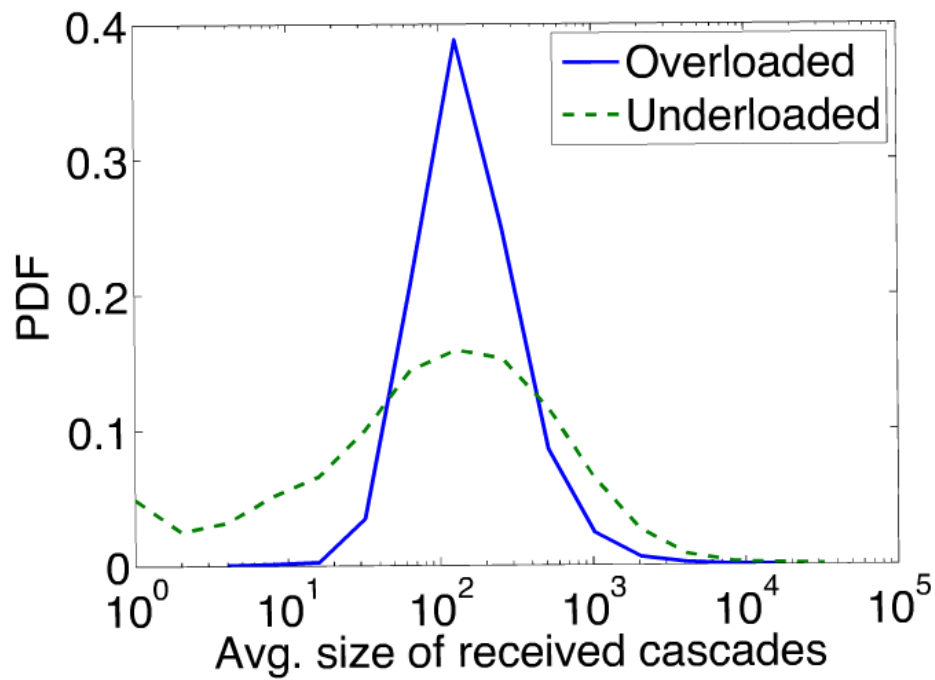


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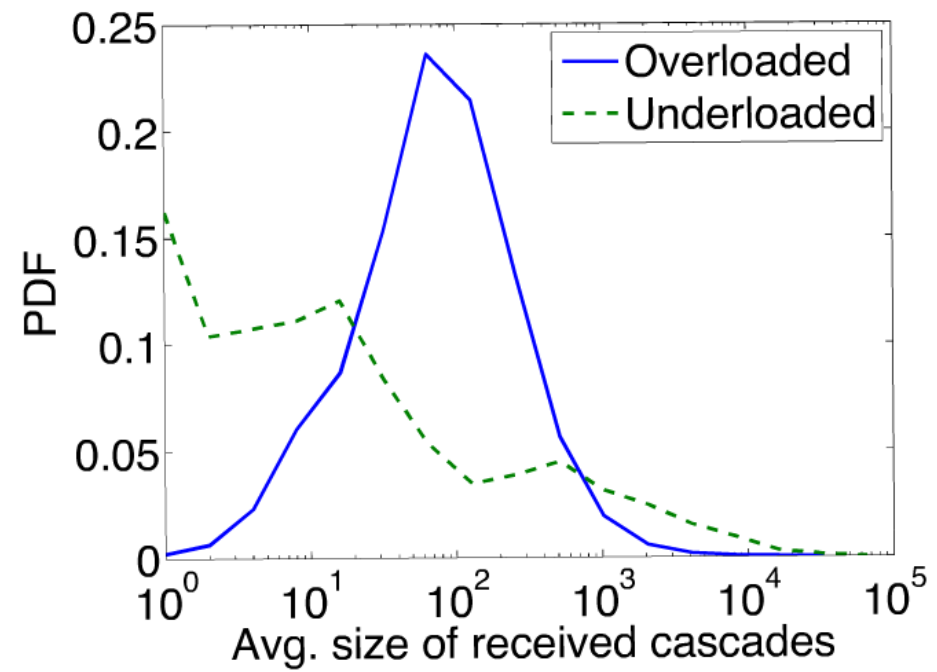
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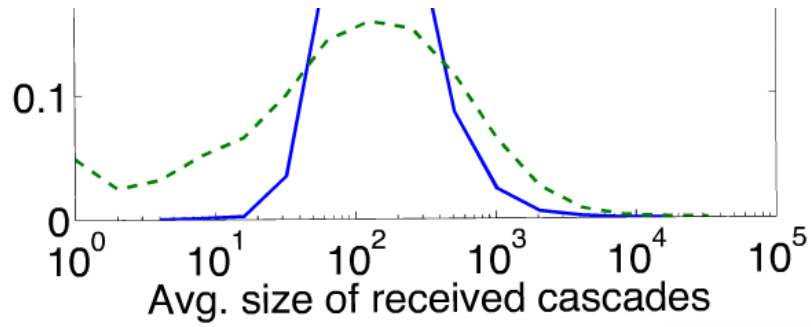
Dilemma: Popularity vs. Overload



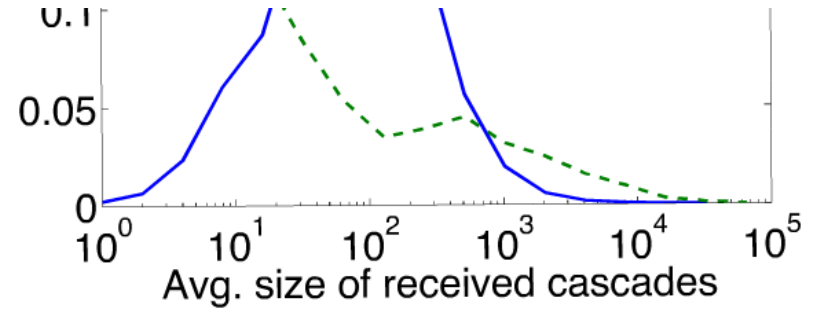
Most Active Users



Least Active Users



Most Active Users



Least Active Users

Overloaded users SEND and RECEIVE more popular content

Conclusions

Your Friends and Followers...

- have more Friends and Followers,
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- and send and receive more Viral content than you.

"Your friends are more interesting than you are!"

Incoming information scales super-linearly with the number of friends

Underloaded Users, on average receive a more popular

and receive
Your friends are

Incoming information scales super-linearly with the number of friends

Overloaded Users receive a more popular content than Underloaded Users, on average

Implications

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Researchers

- Users are not uniformly sampling interesting content
- Unexplained systematic biases stem from connectivity-activity correlations

Practitioners

- Increasing engagement with social media exacerbates observed paradoxes.
- Decreasing engagement decreases exposure to popular content

- Unexplained systematic biases stem from connectivity-activity correlations

Practitioners

- Increasing engagement with social media exacerbates observed paradoxes.
- Decreasing engagement decreases exposure to popular content
- Challenge: build compelling social network w/o information overload

Many Thanks

Co-Authors

- Farshad Kooti
- Prof. Kristina Lerman

Funders

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