

USC Viterbi
School of Engineering

The “majority illusion” and other paradoxes in social perception

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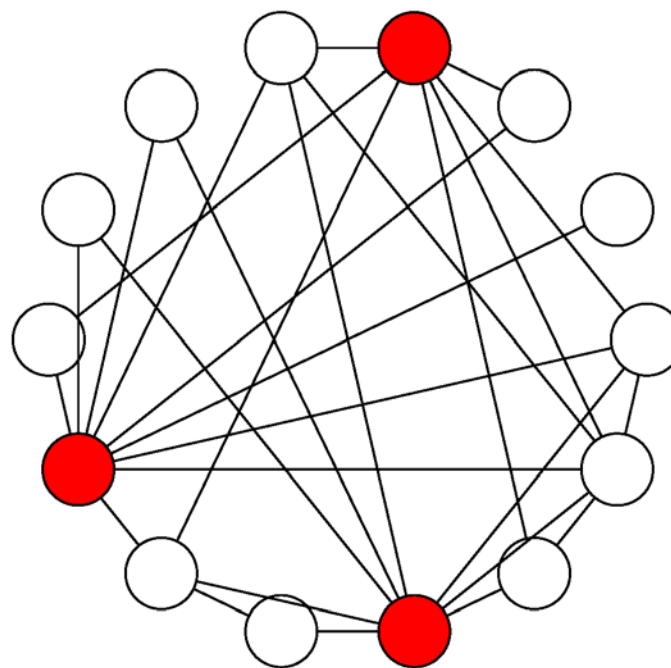
Social perceptions

People's attitudes and behavior are often influenced by their peers

- Adopting an innovation
 - Use of new technology, such as an iPhone

 person who bought an iPhone

 person who does not have an iPhone




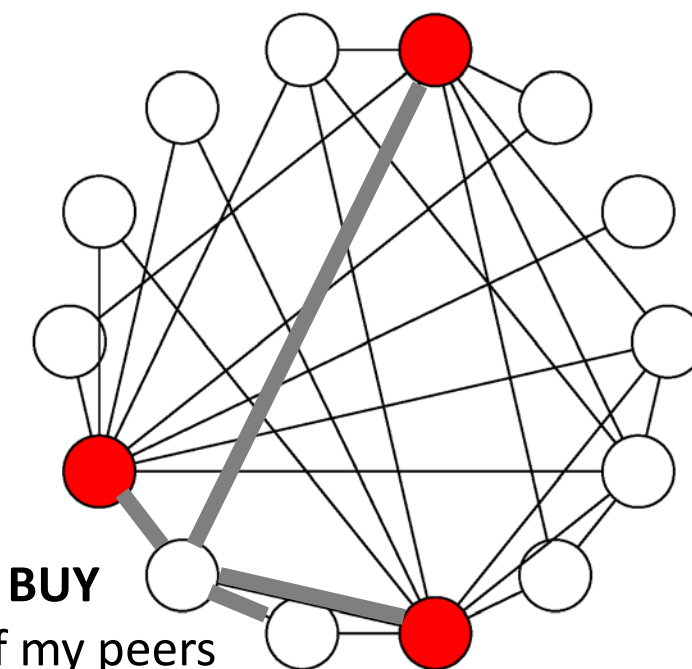
Social perceptions

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BUY

Most of my peers have an iPhone



Social perceptions

People's attitudes and behavior are often influenced by their peers

- Adopting an innovation
 - Use of new technology, such as an iPhone
- Social norms
 - Customs, such as shaking hands
 - Linguistic norms, such as “story” vs “floor”
- Joining a political movement
 - Participation in mass movements, demonstrations

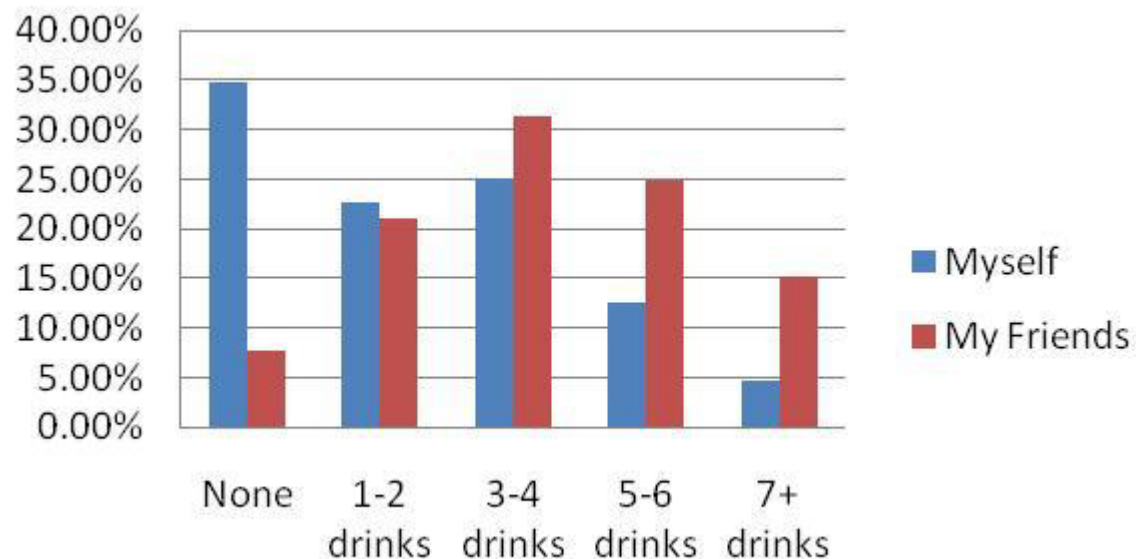
How accurate are social perceptions?

Social perceptions are often wrong

People systematically misperceive their friends' opinions and behavior

- College students overestimate their peers' alcohol use

Perception of how many alcoholic drinks are consumed when at a party (Fall 2009)



Source: Most Students Do PartySafe@Cal

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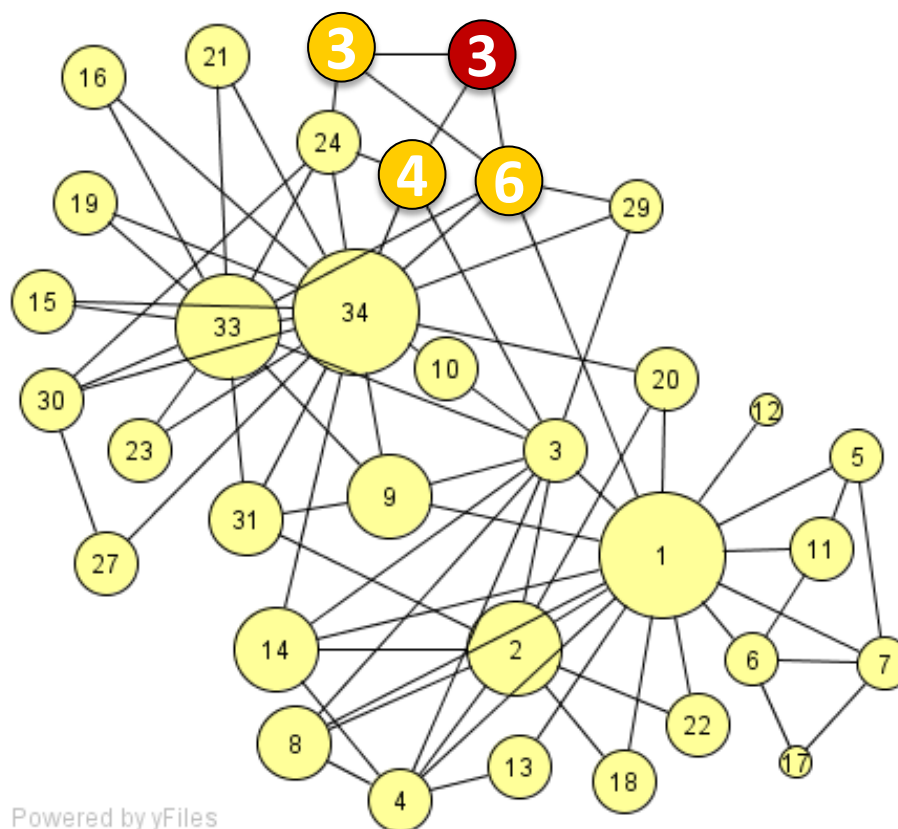
Perception of how many alcoholic drinks are consumed when at a party (Fall 2009)



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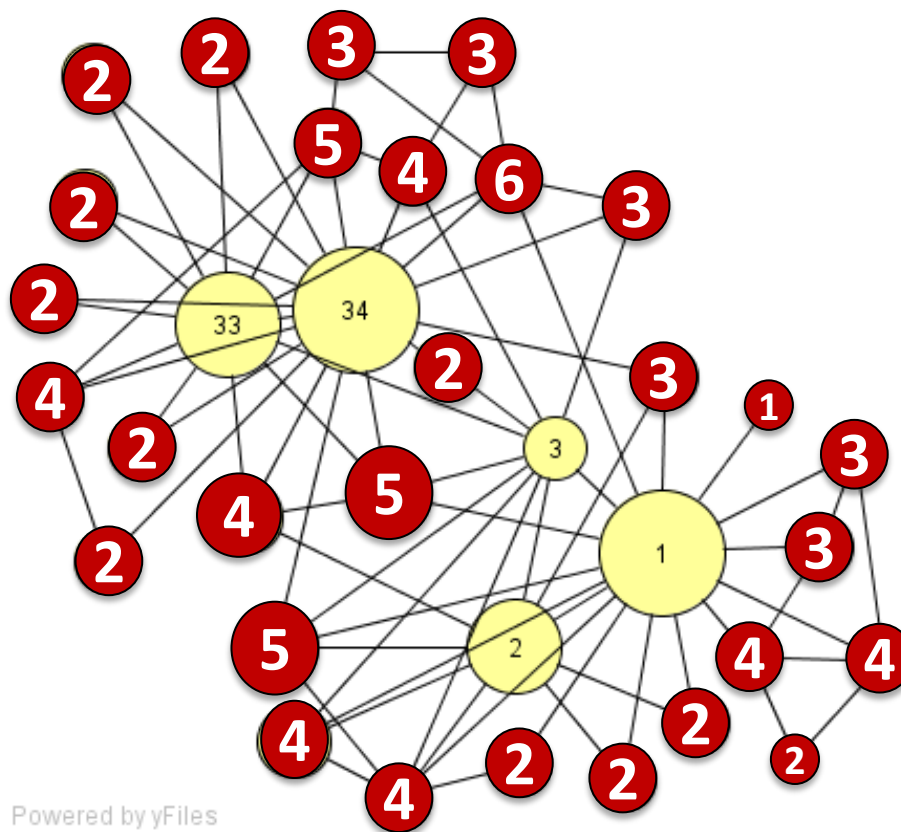
Friendship paradox

Friendship paradox: on average, your friends have more friends than you do [Feld, 1991].



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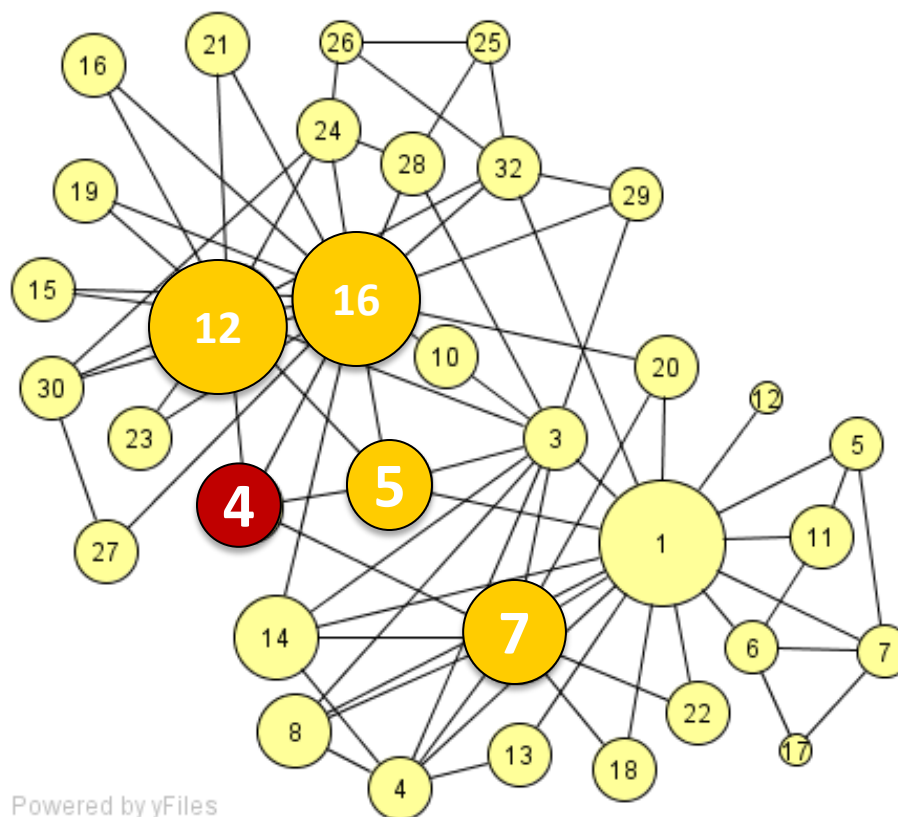


Friendship paradoxes in social networks

- Friendship paradox holds in online social networks
 - On average, your Facebook friends are more popular than you are [Ugander, Backstrom, Marlow 2011]
 - On average, your Twitter followers have more followers than you do [Hodas, Kooti , Lerman 2013]
 - Holds for 98% of Twitter users

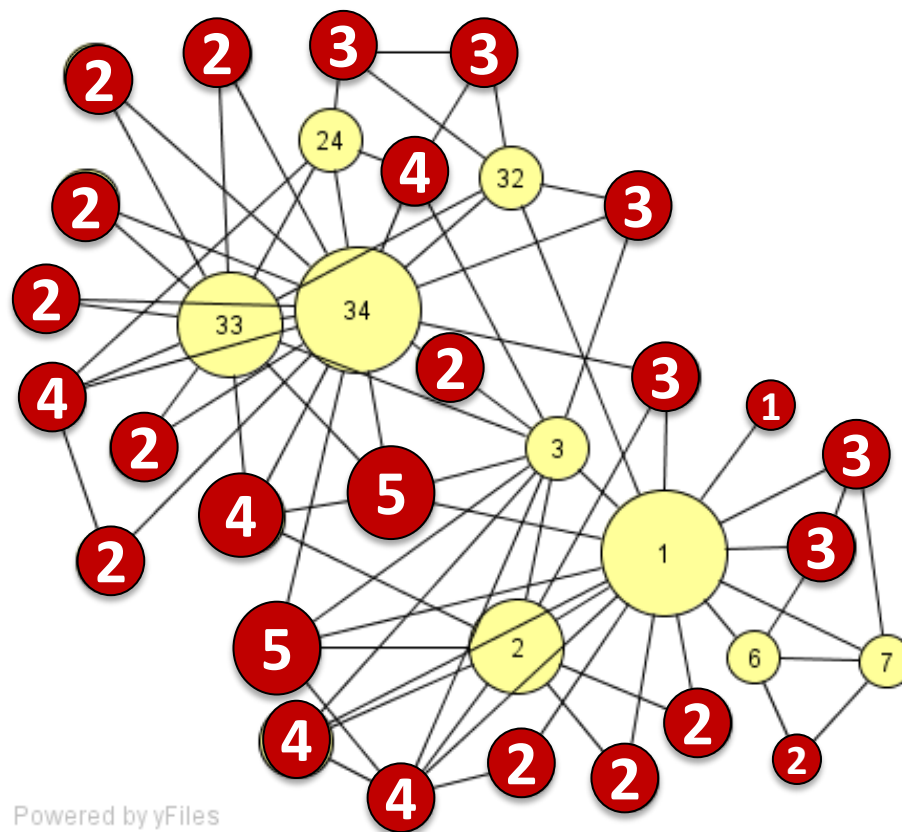
Strong friendship paradox

Most of your friends have more friends than you do
[Kooti, Hodas and Lerman, 2014].



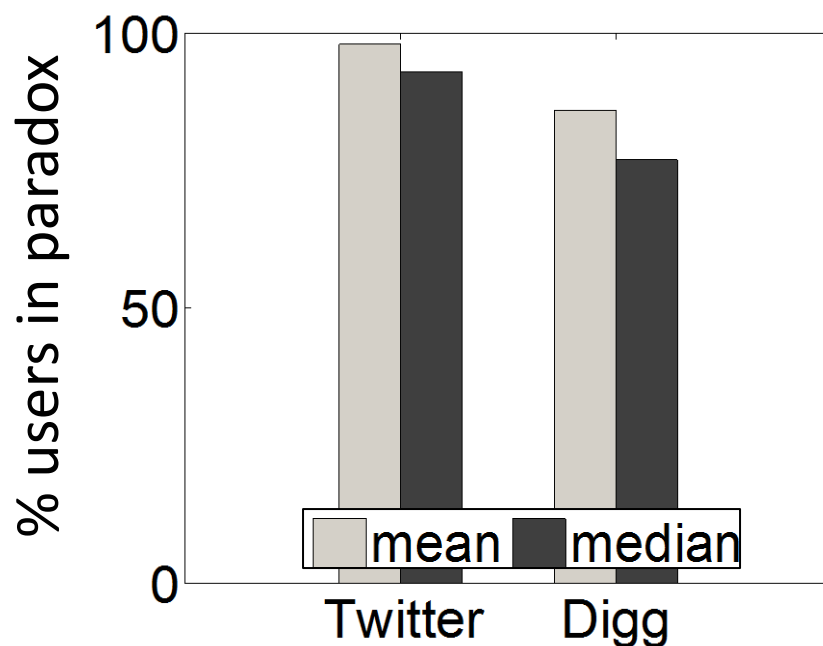
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Strong friendship paradox in online networks

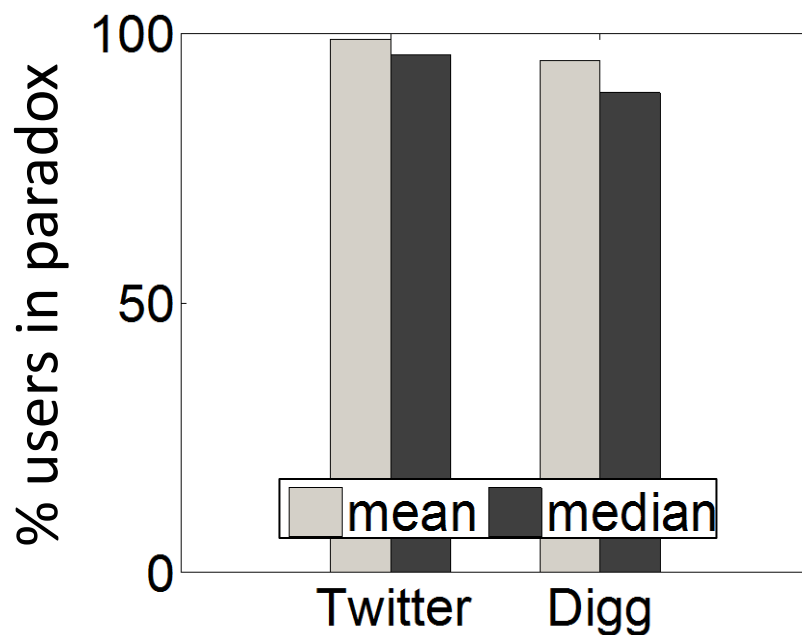
Most of your followers have more followers than you do



93% of Twitter users are less popular than most of their followers

Strong friendship paradox in online networks

Most of the people you follow have more followers than you do

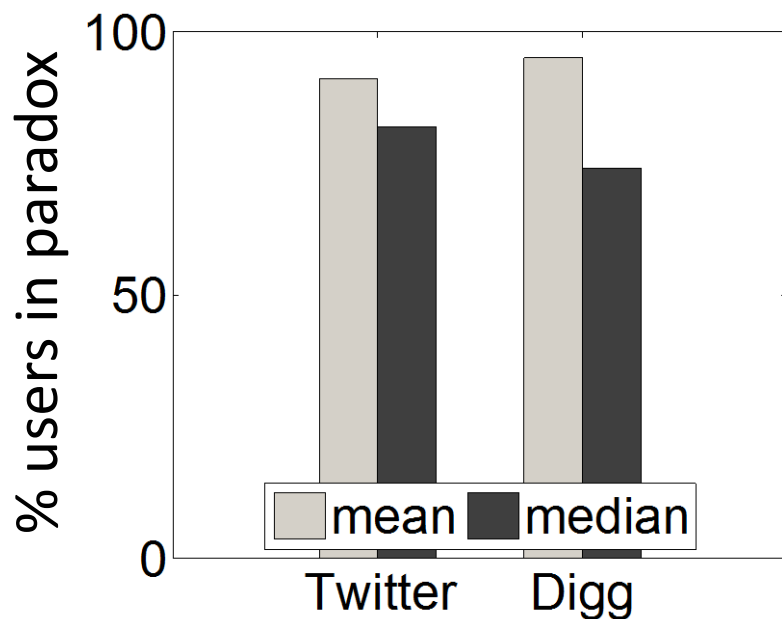


96% of Twitter users follow others (most of whom) are more popular than they are

Strong friendship paradoxes in online network

Paradox holds for attributes other than popularity

- **Activity:** most of your friends post more messages than you do

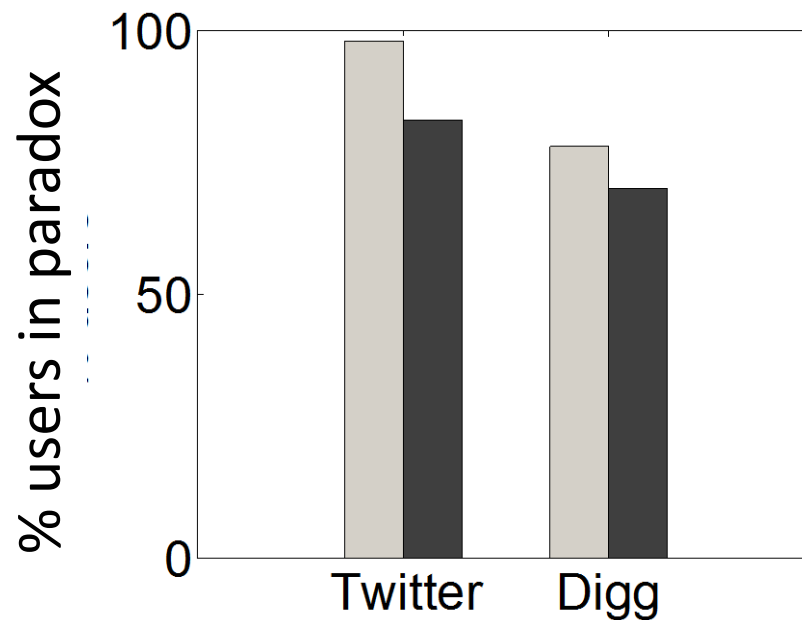


For 82% of Twitter users: Most of the people they follow are more active than they are

Strong network paradoxes in online networks

Paradox holds for attributes other than popularity

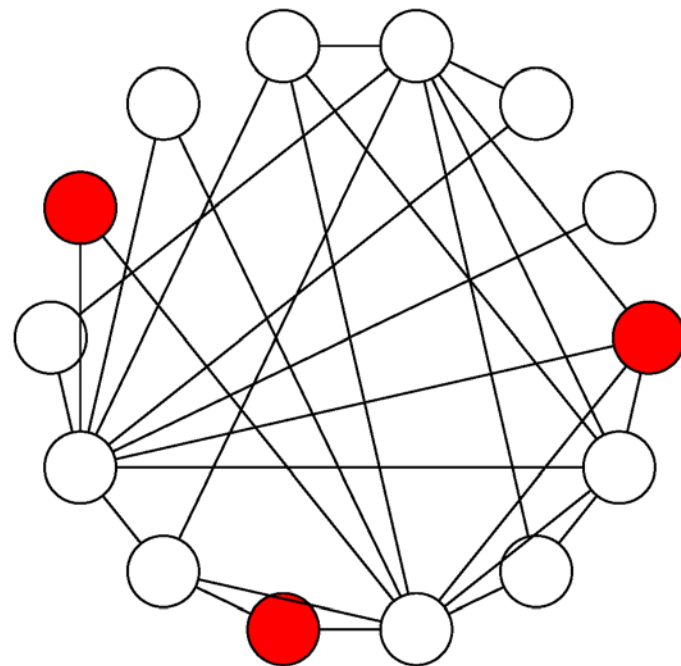
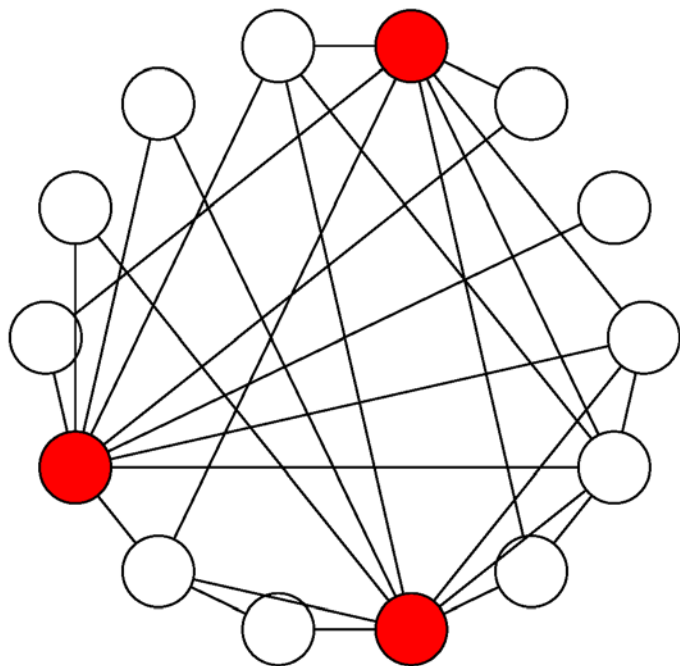
- **Diversity:** most of your friends receive more diverse information than you do



For 83% of Twitter users: Most of the people they follow see more diverse content than they do

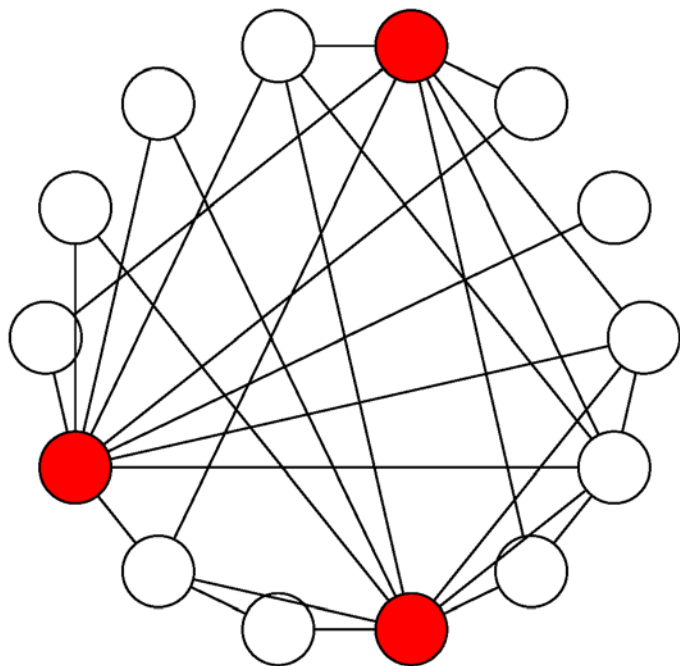
The “majority” illusion

Due to paradoxes, a small number of highly-connected people can skew the perceptions of many.

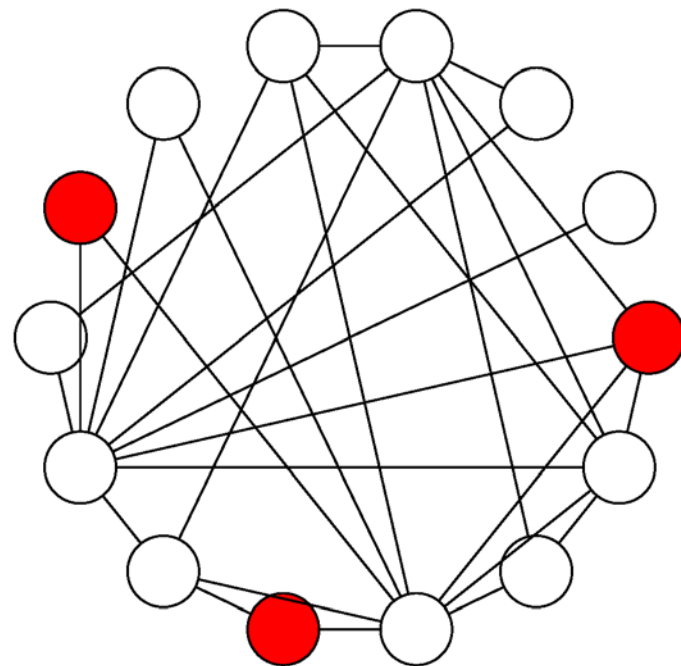


The “majority” illusion

Due to paradoxes, a small number of highly-connected people can skew the perceptions of many.



white nodes: “most of my friends are **red**”

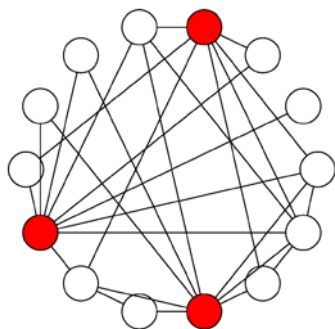


white nodes: “most of my friends are **white**”

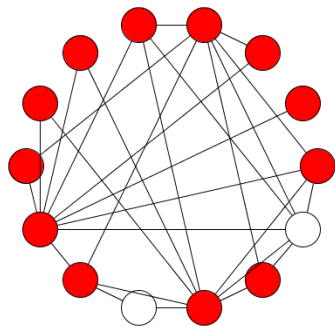
Dynamics of social contagion

Dynamics: person becomes active if most friends are active

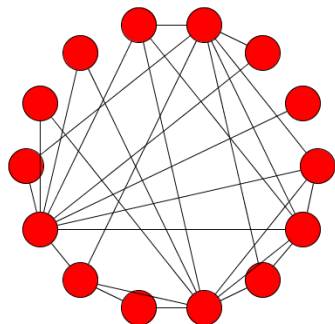
Biased perceptions



time = 0

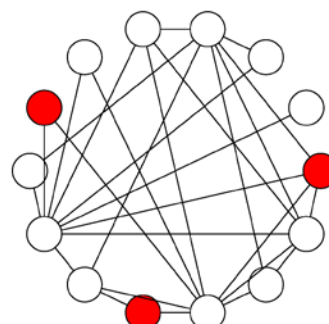
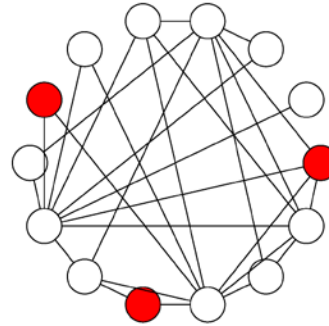
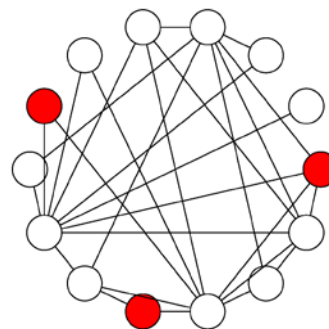


time = 1



time = 2

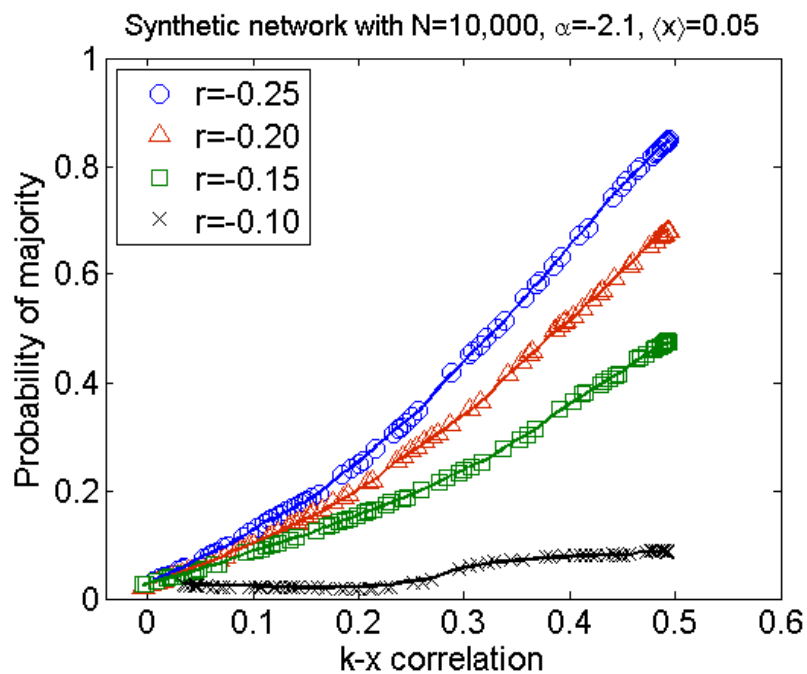
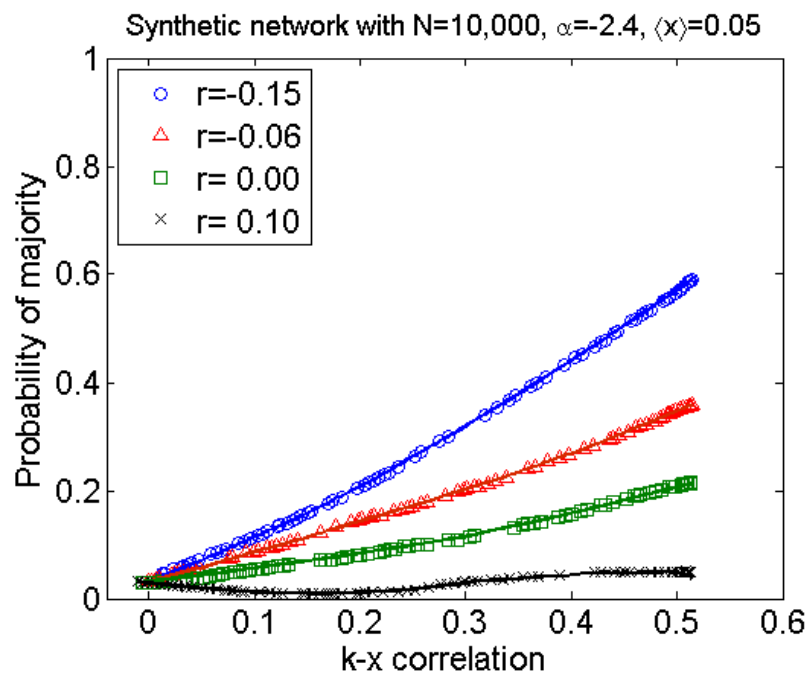
Unbiased perceptions



Majority illusion

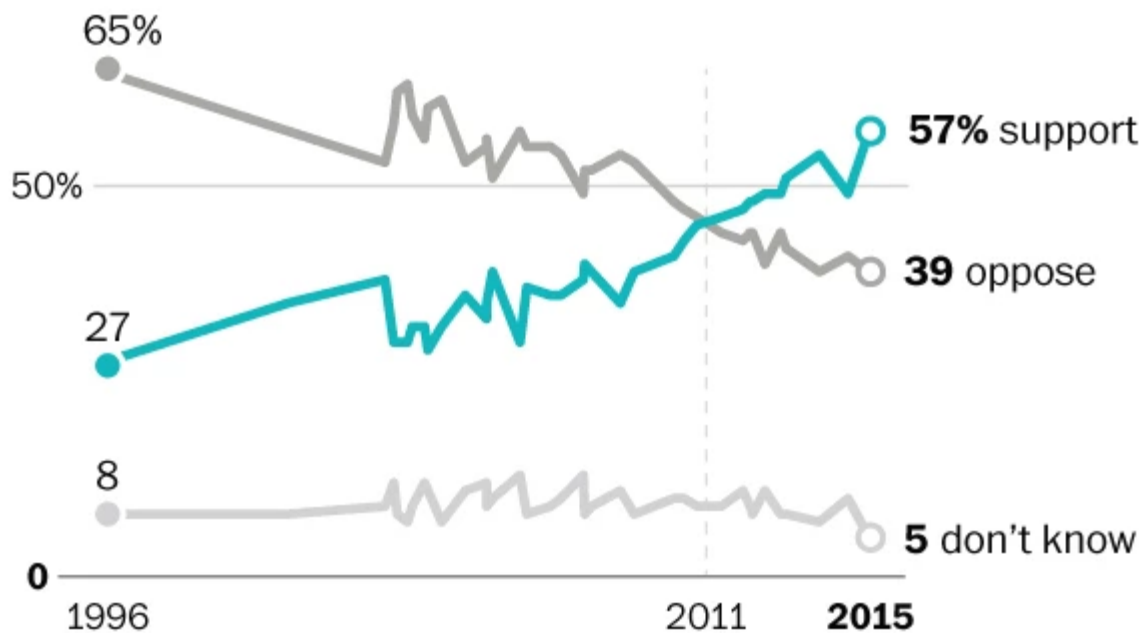
Large fraction of people will see majority active friends even when few people are active overall (e.g., 5%)

- Larger effect for heavy-tailed degree distribution (more hubs)
- Larger effect for stronger correlation (hubs more likely to be active)
- Larger effect in disassortative networks (hubs link to unpopular people)



Support for same-sex marriage in the US

Q: Do you strongly favor, favor, oppose, or strongly oppose allowing gays and lesbians to marry legally?



Source: Pew Research Center

THE WASHINGTON POST



Summary

- Friendship paradoxes can systematically skew social perceptions
 - i.e., perceptions based on local observations of peers
- Structural properties of networks give rise to the paradoxes
 - Heavy-tailed degree distribution
 - Large inequality of popularity
 - Degree disassortativity
 - Popular people linking to unpopular people
 - Degree-activity correlation
 - Popular people more likely to be active



THANK YOU!

Questions?

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