



CS 4803 Social Computing: Social Network Structure II

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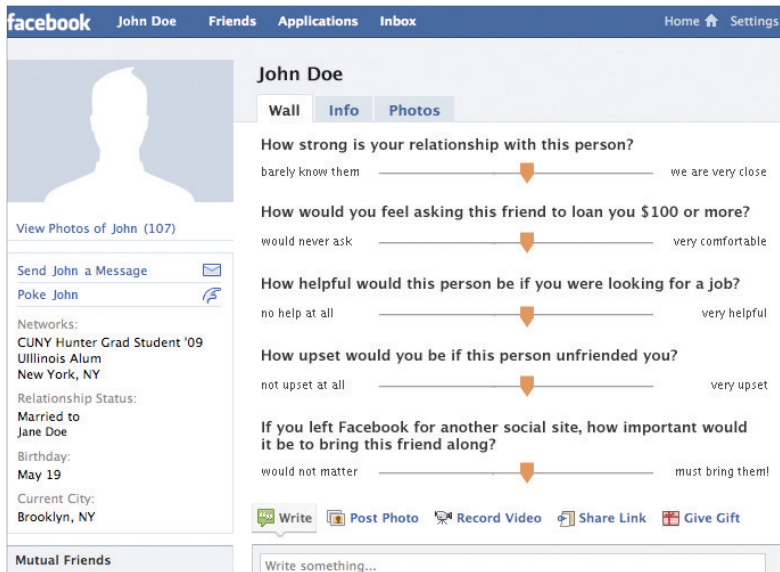
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Predicting Tie Strength With Social Media

Summary

- First study to quantitatively measure social tie strength.
- Based on Facebook data of 35 participants, they define 74 predictor variables of tie strength
- Seven different categories of the predictor variables:
- 85% predictive accuracy based on an OLS regression model; findings supplemented with interviews
- Findings:
 - Intimacy strongest feature; structural balance i.e., number of overlapping networks least
 - Strong ties provide emotional support, weak ties are great for accessing new kinds of information



How strong is your relationship with this person?

barely know them _____ we are very close

How would you feel asking this friend to loan you \$100 or more?

would never ask _____ very comfortable

How helpful would this person be if you were looking for a job?

no help at all _____ very helpful

How upset would you be if this person unfriended you?

not upset at all _____ very upset

If you left Facebook for another social site, how important would it be to bring this friend along?

would not matter _____ must bring them

Predictive Intensity Variables

Variable	Distribution	Max
Wall words exchanged		9549
Participant-initiated wall posts		55
Friend-initiated wall posts		47
Inbox messages exchanged		9
Inbox thread depth		31
Participant's status updates		80
Friend's status updates		200
Friend's photo comments		1352

Intimacy Variables

Participant's number of friends		729
Friend's number of friends		2050
Days since last communication		1115
Wall intimacy words		148
Inbox intimacy words		137
Appearances together in photo		73
Participant's appearances in photo		897
Distance between hometowns (mi)		8182
Friend's relationship status		

6% engaged 32% married
30% single 30% in relationship

Duration Variable

Days since first communication 1328

Reciprocal Services Variables

Links exchanged by wall post 688

Applications in common 18

Structural Variables

Number of mutual friends 206

Groups in common 12

Norm. TF-IDF of *interests* and *about* 73

Emotional Support Variables

Wall & inbox positive emotion words 197

Wall & inbox negative emotion words 51

Social Distance Variables

Age difference (days) 5995

Number of occupations difference 8

Educational difference (degrees) 3

Overlapping words in *religion* 2

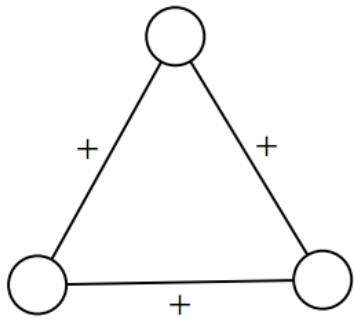
Political difference (scale) 4

Signed Networks in Social Media

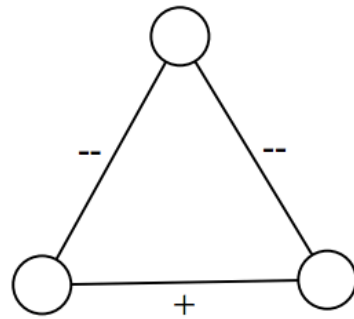
Summary

- In many online and offline contexts, ties can be signed.
- Reasons could span from trust/mistrust to voting and positive/negative perceptions of feedback and interaction
- First large-scale and quantitative validation of theories relating to signed ties
 - Two theories used: theory of status and theory of structural balance
- Focus on Epinions and Slashdot for examining explicitly defined networks, and Wikipedia for implicitly inferred networks
- Findings:
 - Theory of status explains signed tie formation in directed links.
 - Theory of structural balance explains the same in undirected social graphs.

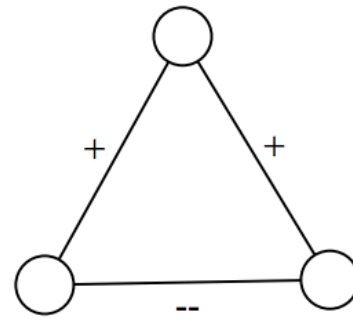
Summary



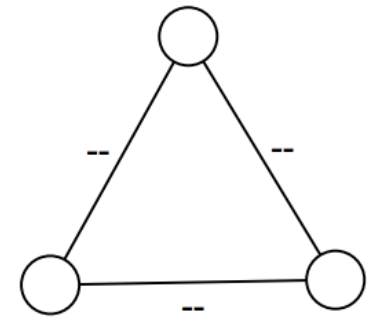
triad T_3



triad T_1



triad T_2



triad T_0

- *Theory of structural balance* – what triads are more plausible in real networks?
- *Theory of status* – a directed positive edge from A to B may mean A finds B as their friend, or because A thinks B has higher status.

Your reflections

Johnnie: Specify tie strength when you add a friend – could this be problematic?

Zach: How the “See Friendship” feature may have affected the tie strength study (Gilbert et al.)

Scenario 1: You want to create an online community in campus for discussing how we can employ technology for social good, for instance, improving lives of people. You want the community to involve various kinds of partners and stakeholders, ranging from undergraduates to graduate students to faculty, and with different kinds of expertise.

Strong ties are important: Yes No

Weak ties are important: Yes No

Both ties are important: Yes No

Because:

Scenario 2: You want to create an in-campus support community online (for instance, a closed/private Facebook group, or a private subreddit) where students can come and self-disclose themselves, discuss about their academic, personal and social challenges, and obtain social and emotional support from others. The community will be a positive behavior reinforcement platform where people can confide in each other, build trust and feel safe.

Strong ties are important: Yes No

Weak ties are important: Yes No

Both ties are important: Yes No

Because:

Scenario 3: You want to create an online community that involves students and others in campus towards a social cause. The community members will come from different backgrounds, having leadership and collegial attributes, and will work with diverse populations across Atlanta to pursue the goals of the social cause. The community will ensure a close-knit environment, built on trust and respect.

Strong ties are important: Yes No

Weak ties are important: Yes No

Both ties are important: Yes No

Because:

The two studies demonstrate whether and how tie strength in social media may be quantified and measured. What studies can it enable, that were not possible otherwise?

In Gilbert et al, structural balance i.e., number of overlapping networks was not found to be a significant predictor (unlike what Granovetter argues). What could be possible reasons behind this?

Except for the signed ties paper, Gilbert et al and Granovetter (last class) do not talk as much about unidirectional ties. How would tie definition and tie strength differ in such contexts e.g., Twitter?

Social networks can be hierarchical, e.g., at an organization. How would definition of social ties and their strength be affected by organizational dynamics? Ref. the papers we read in last week's class.

After all, in online context, interface design/ algorithmic manipulation may hugely impact whether a social tie eventually grows to be a strong or a weak tie. What do you think is the impact?

Are there situations where both strong and weak ties may be useful in an online context?

Burke, M., and Kraut, R. 2014. "Using Facebook after Losing a Job: Differential Benefits of Strong and Weak Ties". CSCW 2013.

- Losing a job is associated with increases in stress, while talking with strong ties is generally associated with improvements in stress and social support.
- Weak ties do not provide these benefits.
- Bridging social capital comes from both strong and weak ties.
- Contrary to the "strength of weak ties" hypothesis, communication with strong ties is more predictive of finding employment within three months

“Felt a little better with supporting comments about losing my job. My friends gave me a better outlook on the situation.”

“Been able to share my worries, get help on Cvs, job hunting and general chit chat about whats happening to others.”

“Much better it is way easier to stay connected when looking for employment t see what others found. If someone finds a lead they cannot use they pass it on in case anyone else can use it. We are finding jobs”

“Yes, [I] am able to commiserate with other colleagues on losing our jobs (due to Bank failure) and getting prospects for new opportunities.”

What does it mean to have “social interaction” in a tie-less system like Yik Yak?