

CS 6474/CS 4803

Social Computing:

Sociological Foundations III

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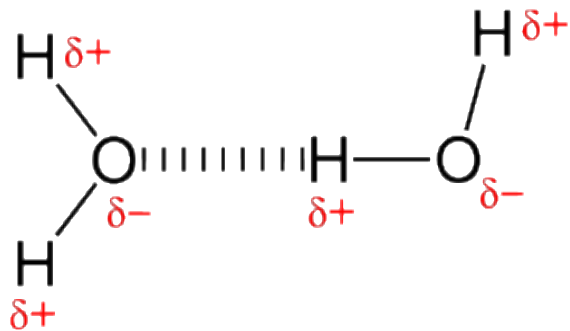
Week 2 | January 15, 2025

The Strength of Weak Ties



Strength of weak ties: Mark Granovetter:

- "It is the distant acquaintances who are actually to thank for crucial information leading to your new job, rather than your close friends!"



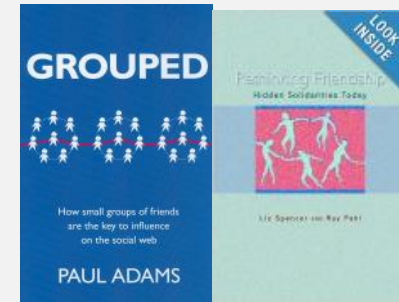
- Mark Granovetter (born October 20, 1943): an American sociologist and professor at Stanford University.
- 1969: submitted his paper to the American Sociological Review—rejected!
- 1972, submitted a shortened version to the American Journal of Sociology—published in 1973 (Granovetter, 1973).
- According to Current Contents, by 1986, the Weak Ties paper had become a citation classic, being one of the most cited papers in sociology.

Summary

- Strong, weak and absent ties
- Triangle closure (theory of structural balance), unless forbidden triad
- Finding: even weak ties can be valuable
- Strong ties are high maintenance; weak ties prevent small highly connected cliques from fragmenting

Are the gradations “strong”, “weak” and “absent” sufficient for characterizing ties?

Tie strength in social network



- According to [Rethinking Friendships: Hidden Solidarities Today (Princeton, 2006) by Liz Spencer and Ray Pahl], there are eight different types of relationships:
 - Associates: don't know each other well, and only share a common activity, such as a hobby or a sport.
 - Useful contacts: share information and advice, typically related to our work or career.
 - Fun friends: socialize together primarily for fun without a deep relationship to provide each other with emotional support.
 - Favor friends: help each other out in a functional manner but not in an emotional manner.
 - Helpmates: display characteristics of both favor friends and fun friends; socialize together for fun and also help each other out in a functional manner.
 - Comforters: similar to helpmates but with a deeper level of emotional support.
 - Confidants: disclose personal information to each other, enjoy each other's company, but aren't always in a position to offer practical help.
 - Soulmates: display all of these elements and are the people we're closest to.
- We have a much smaller number of strong ties than weak ties.

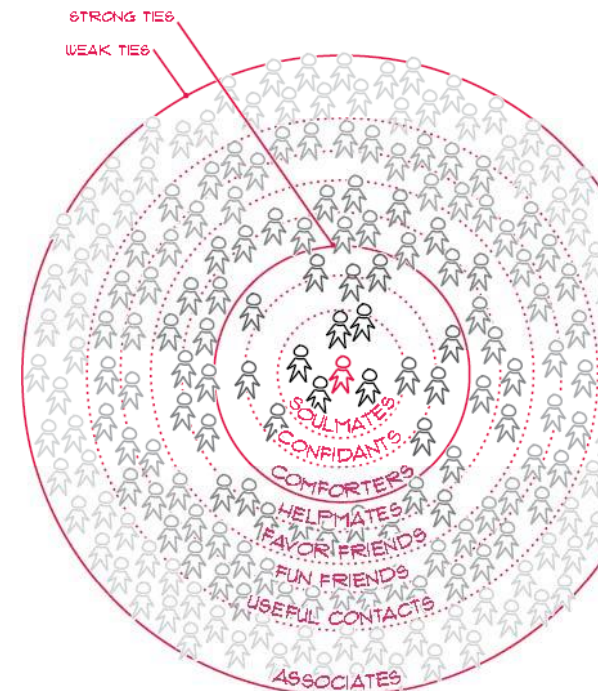
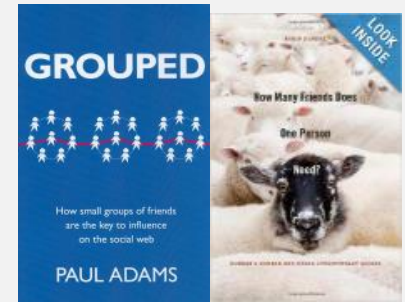


Figure: Credit: (Adams, 2011)

Tie strength: the 5-15-50-150-500 rule



- According to [How Many Friends Does One Person Need?: Dunbar's Number and Other Evolutionary Quirks, Robin Dunbar, Harvard University Press (November 1, 2010)]:
 - Most people's social networks have a common pattern, unchanged for thousands of years.
 - There are clear boundaries based on the number of connections we have; it starts at five and goes up by a factor of three.
 - Inner circle: 5
 - sympathy group: 12-15
 - Semi-regular group: 50
 - stable social group: **150** (the Dunbar number)
 - friends of friends group (weak ties): 500
- Robin Ian MacDonald Dunbar (born 28 June 1947): a British anthropologist and evolutionary psychologist and a specialist in primate behavior at University of Oxford.
- Best known for his Dunbar's number: a measurement of the "cognitive limit to the number of individuals with whom any one person can maintain stable relationships".

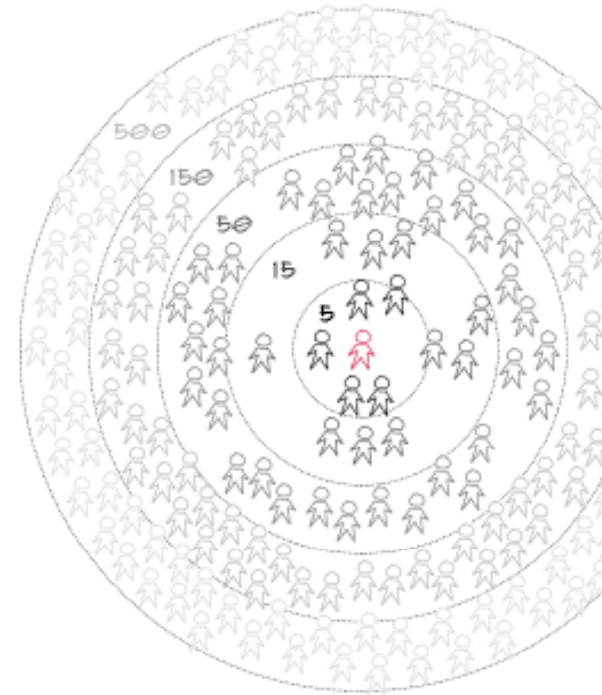


Figure: Credit: (Adams, 2011)


Content or context of ties not considered; theory not validated with diverse data!

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

facebook John Doe Friends Applications Inbox Home Settings



John Doe

Wall

Info

Photos

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!

Write

Post Photo

Record Video

Share Link

Give Gift

View Photos of John (107)

Send John a Message

Poke John

Networks:

CUNY Hunter Grad Student '09

Ullinois Alum

New York, NY

Relationship Status:

Married to Jane Doe

Birthday:

May 19

Current City:

Brooklyn, NY

Mutual Friends

Write something...

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

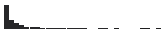
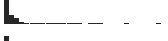
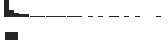
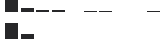




How upset would you be if this person unfriended you?

not upset at all ————— very upset


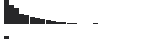
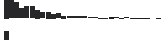

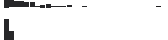

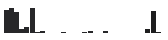

If you left Facebook for another social site, how important would it be to bring this friend along?

would not matter ————— must bring them


Predictive Intensity Variables

Predictive Intensity Variables	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


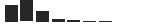
Intimacy Variables

Intimacy Variables	Distribution	Max
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	<div>6% engaged</div> <div>30% single</div> <div>32% married</div> <div>30% in relationship</div>	


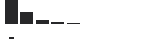

Duration Variable

Days since first communication		1328
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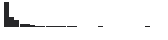
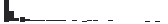
Reciprocal Services Variables

Links exchanged by wall post		688
Applications in common		18

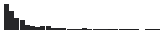
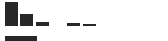



Structural Variables

Number of mutual friends		206
Groups in common		12
Norm. TF-IDF of <i>interests</i> and <i>about</i>		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 <i>religion</i>		2
Political difference (scale)		4

Class Discussion

Why should we care about measuring tie strength on social media? How does it impact our studies of social computing systems? How does it impact design?

Implications of strong ties online –
should we always prefer weaker ties?

Using Facebook after Losing a Job: Differential Benefits of Strong and Weak Ties

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ABSTRACT

Among those who have recently lost a job, social networks in general and online ones in particular may be useful to cope with stress and find new employment. This study focuses on the psychological and practical consequences of Facebook use following job loss. By pairing longitudinal surveys of Facebook users with logs of their online behavior, we examine how communication with different kinds of ties predicts improvements in stress, social support, bridging social capital, and whether they find new jobs. Losing a job is associated with increases in stress,

benefits they would not otherwise have, a phenomenon known as social capital [6,16,36,44]. Social capital derives from one's position in a social network and the number and character of the ties one maintains [12,48]. One's connections differ in tie strength or closeness, from lovers to near-strangers. Granovetter defined tie strength as a "combination of the amount of time, the emotional intensity, the intimacy (mutual confiding), and the reciprocal services which characterize the tie" [23].

There is strong theoretical rationale and empirical evidence

“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.”

Article



The Strength of Weak Ties Revisited: Further Evidence of the Role of Strong Ties in the Provision of Online Social Support

Nicole C. Krämer ¹, **Vera Sauer**¹, and **Nicole Ellison**²

Abstract

In this work, we challenge the assumption that weak ties play uniquely important social support roles on social network sites, particularly regarding informational support. To overcome methodological limitations of earlier research, we present a mixed-methods study. Forty-one participants were interviewed and asked to identify five weak, medium, and strong ties each and to report on perceived and actually received social support (emotional, informational, instrumental, and appraisal) associated with each. Complicating traditional understandings of “the strength of weak ties,” the qualitative analyses of actual support events show that both emotional and informational support is provided by strong ties. In an additional quantitative between-subjects study design, 352 participants were asked about various aspects of a weak, medium, or strong tie. These results indicate that participants valued their strong ties more regarding every form of support. Although there were only weak correlations between perceived and recalled actually received support, people also report actual support events with strong ties to be more helpful—overall suggesting the strength of strong ties.

Implications of strong ties online –
can strong ties be damaging?

The Social Structure of Political Echo Chambers: Variation in Ideological Homophily in Online Networks

Andrei Boutyline

University of California, Berkeley

Robb Willer

Stanford University

We predict that people with different political orientations will exhibit systematically different levels of political homophily, the tendency to associate with others similar to oneself in political ideology. Research on personality differences across the political spectrum finds that both more conservative and more politically extreme individuals tend to exhibit greater orientations towards cognitive stability, clarity, and familiarity. We reason that such a “preference for certainty” may make these individuals more inclined to seek out the company of those who reaffirm, rather than challenge, their views. Since survey studies of political homophily

Implications of strong ties online –
beyond strong and weak ties

Signed Networks in Social Media

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ABSTRACT

Relations between users on social media sites often reflect a mixture of positive (friendly) and negative (antagonistic) interactions. In contrast to the bulk of research on social networks that has focused almost exclusively on positive interpretations of links between people, we study how the interplay between positive and negative relationships affects the structure of on-line social networks. We connect our analyses to theories of signed networks from social psychology. We find that the classical theory of structural balance tends to capture certain common patterns of interaction, but that it is also at odds with some of the fundamental phenomena we

duce these complex relationship to the existence of simple pairwise links. It is a fundamental research problem to bridge the gap between the richness of the existing relationships and the stylized nature of network representations of these relationships.

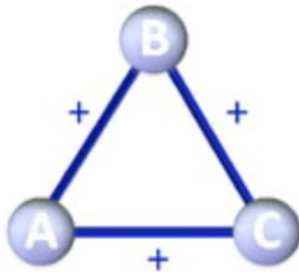
The main focus of our work here is to examine the interplay between positive and negative links in social media — a dimension of on-line social network analysis that has been largely unexplored. With relatively few exceptions (e.g., [1, 15, 16]), research in on-line social networks has focused on contexts in which the interactions have largely only positive

Signed Ties and Structural Balance

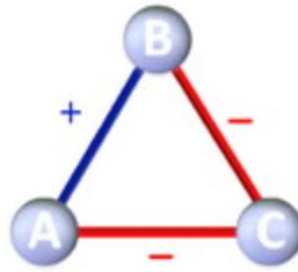
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BALANCED

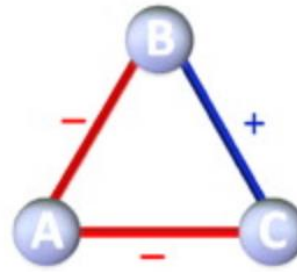
The friend
of my friend
is my friend



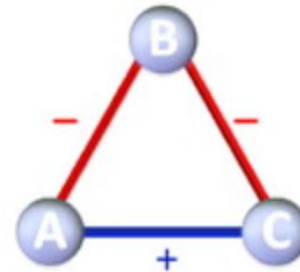
The enemy
of my friend
is my enemy



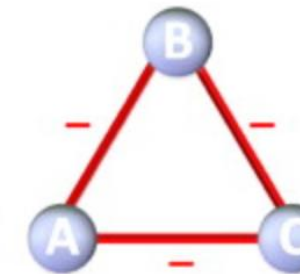
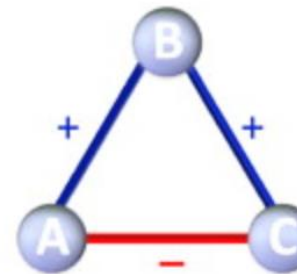
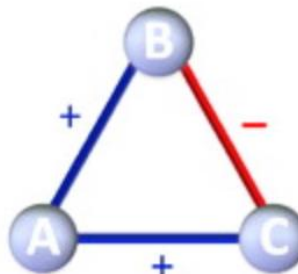
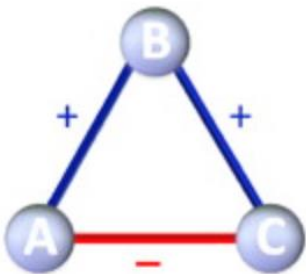
The friend
of my enemy
is my enemy



The enemy
of my enemy
is my friend



UNBALANCED



New types of “tie”-less systems

What does it mean to have “social interaction” in a tie-less system like Reddit/YouTube?

Multiple platform use

Today we use more and more types of networks, and our contacts are spread across them. Social ties depend on the content of our interactions on these platforms. What does therefore a strong (or weak) tie on one platform mean for the other?

Algorithmic Influence

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?

Class Exercise

Scenario 1: You want to create an online community in campus for discussing how we can employ technology for social good, for instance, improving the experiences of individuals on campus. 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
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Weak ties are important:	Yes	No
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Both ties are important:	Yes	No
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Because...

Class Exercise

Scenario 2: 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 engage in a variety of outreach work.

Strong ties are important:	Yes	No
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Weak ties are important:	Yes	No
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Both ties are important:	Yes	No
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Because...

Class Exercise

Scenario 3: 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...

The case of social mobility, weak ties, and social media

- *"Wilson's (1978, 1987) theory of the underclass suggests that as poor African Americans have come increasingly to live in high-poverty neighborhoods, they have lost connections to people who provide ties to the labor market. Their social isolation contributes to difficulties in finding work, and it hinders social mobility"*
- Internet and social media should have made it better?