Not (P)interested: The problem with the Pinterest echo chamber

Although not as focused on flaunting fame and followers as other social media sites, the homogenous wormhole of Pinterest poses its own obstacles to the innovation of genuine style.

On Pinterest, the most recommended pins for tags like "fashionable" or "aesthetic" often reflect only what is trendy, since that's what the feed algorithm favors. Unique content remains underrepresented, which can harm users' ability to innovate.
Strong and Weak
CS 278 | Stanford University | Michael Bernstein
Announcements

Project proposal + prototype due tonight. Project milestone will be due the Tuesday of Week 7

- Zone 1: either the front-end or the back-end is functional
- Zone 2: no-code components of the project should be complete; code components may still be in progress
- Zone 3: launch! no-code components are complete, so take the system live and start recruiting

Assignment 2—an individual assignment—is launching today
One common strategy for managing growth is to decide on a subset of content to show users, through an algorithmic feed. Global rankings aggregate up/downvotes, then trail off over time. Personalized rankings predict on-platform behaviors, then assign weights to each predicted behavior to determine a score.

Concerns abound about feeds creating filter bubbles and echo chambers. While there are clearly negative outcomes, the science is now catching up to what turns out to be a complicated story.
Surgeon General Warns That Social Media May Harm Children and Adolescents

The report by Dr. Vivek Murthy cited a “profound risk of harm” to adolescent mental health and urged families to set limits and governments to set tougher standards for use.

 Does social media make you lonely?
Do social computing systems make us lonely?

Internet Paradox

A Social Technology That Reduces Social Involvement and Psychological Well-Being?

Robert Kraut, Michael Patterson, Vicki Lundmark, Sara Kiesler, Tridas Mukopadhyay, and William Scherlis

Carnegie Mellon University
Do social computing systems make us lonely?

No.

Well, yes.

Sort of. It depends on how and when you use it.
To answer, we need to dive into: why do these feel different?
Tie Strength

[Granovetter 1973]

Not all of our relationships are the same.
Some are strong ties: trusted friends and family.
Others are weak ties: rough acquaintances.
Today’s claim: social computing systems must design for each of these groups differently.
Today
Strong ties
What are we designing for when we design for strong ties?

Think:

Your BFF
Your roommate
Your mom

Strong ties typically have thick offline context. This means that the social computing system will never see everything about the relationship.
Who are our strong ties?

Strong ties are typically in the social networks that we are already deeply embedded in. [Granovetter 1973]

Strong ties provide social and emotional support that improve mental health. [Thoits 2011]

Strong ties communicate with us through multiple channels, rather than through a single widely-available channel (e.g., email). [Haythornthwaite and Wellman 1998]
Designs for strong ties

Often, the design goal is to maintain or deepen the strong tie relationship.
Designs for strong ties

Friend meetups on Animal Crossing, Nintendo

House Party

Play Chips & Guac, and other games with your friends.

NEW!

Your Parent's Basement

A popular dwelling for many men in their 20s.

Other examples?

Instagram Close Friends (strong tie feature glued onto a weak tie app)
Why does this work?

Why do designs for strong ties succeed at their goal?

Why don’t other social computing systems (e.g., Instagram) seem quite so good at it?

What’s the secret?

[2min]
Honest Signals

[Donath 2007; Pentland 2010; Smith and Harper 2003]

In social situations, it’s easy and quick to throw out perfunctory signals that you care about someone.

“We should grab coffee!” [Your Flaky Friend 2024]

However, other signals are much more costly to produce, and so they are more honest.

In nature: peacocks have amazing plumage because there is no way to fake having the nutritional resources to waste on them.

In social life: spending time on something for someone matters.
Strong tie designs as honest signals

What makes designs effective at maintaining and deepening strong ties is that they operate as honest signals: that I cannot fake the attention and effort I am putting into our interactions.

I respond to the text…or I don’t.

I FaceTime you…or I don’t.

I send you silly emails…or I don’t.
Weak ties
What are we designing for when we design for weak ties?

Think:

That person you kind of remember from your freshman dorm

Someone on the team that you interned with last summer but haven’t kept in close touch with

Acquaintances you see occasionally

Weak ties typically have thin context because they interact more sparsely. It’s much more likely that WYSIWYG for the system.
Who are our weak ties?

Weak ties often represent connections to parts of the social network that we do not inhabit. [Granovetter 1973]

People with weak ties to other organizational units in a company tend to have higher performance reviews and generate more creative ideas. [Burt 2004]

Weak ties often communicate through a single commonly-available channel (e.g., email, Facebook), rather than a multiplicity of channels. [Haythornthwaite and Wellman 1998]
Designs for weak ties

Design goals with weak ties are often: Keeping tabs. Celebration. Social movements. Broadcast.
Designs for weak ties

Other examples?

(Email is trying to do both strong and weak tie communication. It’s one reason why email can stink.)
The strength of weak ties

[Granovetter 1973]

Because they are connected to parts of the network that we cannot access, weak ties are valuable sources of new perspectives and professional opportunities: people find jobs through weak ties.

Investigating Facebook log data: while most people are helped through one of numerous weak ties, a single strong tie is still much more valuable at the margin [Gee et al. 2017]

Investigating LinkedIn’s “People You May Know” algorithm: the relationship is an inverted U: medium tie strength is “best” [Rajkumar et al. 2022]
Weak tie designs as bustling spaces

Yes, we all leverage weak ties occasionally for favors. But FOMO is not enough of a design lever for most systems to stay active.

So, many weak tie designs instead lean on creating bustling spaces

Facebook, Instagram, Twitter, Mastodon: newsfeed

…and weak tie systems die if they’re perceived to be ghost towns
The Weak Shall Inherit

In nearly every social system, there will be extreme inequality (\approx \text{power law distribution}) in contribution volume.

This means that most of the content you see on Facebook/Twitter/dorm lists is from a small proportion of the people who are on it.
The Weak Shall Inherit

So, chances are, most of the content you see on social computing platforms is from your weak ties.

Design challenge: how do you make content from people you barely know worthwhile?

If you are an RA, how do you make the dorm community feel connected even if only a small percentage are actively contributing?
Tie strength in action

How tie strength plays out dynamically in social computing systems
Tie strength changes

[Burke and Kraut 2014]

Tie strength isn’t static over time, and social media use changes it. Tie strength does go up on Facebook by reading and reacting to broadcast content:

- Looking at photos
- Reading status updates
- Performing one-click actions
- Washing machine bounced its way halfway across the room and then broke its own door :(

[Image of a Facebook post showing sunlight streaming through trees with a comment that a washing machine broke its own door]
Tie strength changes

[Burke and Kraut 2014]

Tie strength isn’t static over time, and social media use changes it. However, tie strength goes up much more with one-to-one communication:

Authoring posts to them

Messaging them one-on-one

Commenting on their posts
Tie strength can be predicted

[Gilbert and Karahalios 2009]

It is feasible to use observable behaviors in social networks to classify the tie strength between two people in the network.

Highly predictive features:

- How recently have you messaged?
- How long ago did you first message?
- Do you talk a lot to each other?

![Graph showing highly predictive features](image)
Resulting designs

News feed ranking: not just a feature of the content, but also of your predicted tie strength with the other person

People you may know: friend suggestions

Dynamically choosing whether to show comment boxes or quick feedback buttons based on the content and your tie strength with the person

Like vs. Write a comment...
A note of caution
[boyd 2004; boyd 2023]

On Friendster, the system would look for people who share a number of strong ties, but are not connected to each other:

Friendster:  and  should totally date!
Let’s recommend that they connect!

Reality:  and  are actually exes.
What about no ties?

At least initially, the members of these systems may not know each other at all. Is the goal of the system to build tie strength? Or something else? [1 min]
Form-From

[Zhang et al. 2024]

To handle cases like these, we need a more robust design space
How is content delivered?

**Spaces**

Joinable locations

**Network**

Friend or follow relationships

**Commons**

Drawn from entire platform
Form  How content is organized

Flat
Posts are not explicitly linked, e.g., streams

Threaded
Posts are explicitly linked to each other, e.g., replies
Flat
Posts are not explicitly linked, e.g., streams

Slack
Discord
Clubhouse
IRC

Threaded
Posts are explicitly linked to each other, e.g., replies

Reddit
Email
Quora
4chan

Spaces
Joinable locations

Instagram
Twitter
Tumblr
Flickr

Network
Friend or follow relationships

TikTok
Instagram Reels
Threads
YouTube Shorts

Commons
Drawn from entire platform
Flat
Posts are not explicitly linked, e.g., streams

Threads
Posts are explicitly linked to each other, e.g., replies

Spaces
Joinable locations

Network
Friend or follow relationships

Commons
Drawn from entire platform

- Slack
- Discord
- Clubhouse
- IRC
- Reddit
- Email
- Quora
- 4chan
- Early Facebook
- Early LinkedIn
- MySpace
- Friendster
- Pinterest
- Snapchat Discover
- Tinder
- ChatRoulette
- Instagram
- Twitter
- Tumblr
- Flickr
- TikTok
- Instagram Reels
- Threads
- YouTube Shorts

1970–1984
1985–1994
1995–2004
2005–2014
2015–present
Using Form-From

Claim: design patterns are similar within cells of the Form-From design space, and different across cells.

In other words, locate your design in Form-From, then look to other examples in that cell to find common designs you ought to consider.

- Threaded Spaces: upvote/downvote ranking feedback (e.g., Reddit)
- Threaded Network: common social network design patterns such as likes/favorites, shares, comments
- Threaded Commons: content from the entire platform is algorithmically recommended based on user feedback
Example design patterns

Flat
(a) Visual IRC  (b) Slack  (c) Clubhouse

Threaded
(d) Eudora email  (e) phpBB  (f) Reddit

Spaces

Network
(g) Friendster  (h) MySpace  (i) early Facebook
(j) LiveJournal  (k) early Twitter  (l) Instagram

Commons
(m) Snapchat Discover  (n) Pinterest  (o) Tinder
(p) TikTok  (q) Instagram Reels  (r) Threads
Back to the original question:

Do social computing systems make us lonely?
It depends on how you use it.

[Burke and Kraut 2016]

An opt-in study of ~2000 Facebook users, connected to their internal log data, revealed:

- Viewing strong or weak ties’ status broadcasts, receiving 1-on-1 messages from weak ties, or receiving one-click feedback from strong or weak ties…
- Receiving one-on-one communications from strong ties…

No improvements in psychological well-being.

Improvements in psychological well-being.
It depends on when you use it.

[Orben et al. 2022]

Data source: longitudinal surveys of UK citizens comparing life satisfaction to social media use

The graph that I will show compares satisfaction across age groups, split by level of self-reported social media usage:
It depends on when you use it.

[Orben et al. 2022]

“Window of sensitivity”: early adolescence is the time when heavier usage is most associated with negative outcomes—most pronounced in girls.
Summary

We should not design social computing systems to treat our relationships as all the same.

Strong ties: a small number of people we know well — design for honest signals, and don’t assume all communication happens through the system.

Weak ties: a large number of acquaintances — design to support feelings of connectedness, but remember that many social systems will be dominated in volume by weak ties.

The impacts of social media use on our wellbeing are most negative for those passively consuming content (esp. from weak ties), and for heavy usage among early adolescent girls.
References


Friend, Your Flaky. Personal Communication.


References


Thoits, Peggy A. "Mechanisms linking social ties and support to physical and mental health." Journal of health and social behavior 52.2 (2011): 145-161.

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