



Bustling Streets and Ghost Towns

CS 278 | Stanford University | Michael Bernstein

Sorry, but I need some space.

We may be moving into a larger room starting with next Tuesday's lecture. Stay tuned.

Discussion section signups

Sign up by Sunday at 11:59 PT via the link at cs278.stanford.edu.

There will be multiple sections during the same time slot

If you miss this deadline, you'll be on the waitlist if the section you want is full.

We'll also have a waitlist for section swaps

Your project will be with folks in your section

Coming up

Assignment 1 (Going Viral) is due Monday 11:59pm

Attendance sheet

It's circulating — grab a TA if it doesn't make its way to you

Extra credit for examples

At my discretion, I'll give out 1% extra credit to students who suggest real-world examples of class concepts

Criterion: I deem it high-enough quality that I want to try and integrate it into a future year's version of the lecture

1% per example; max 5% per student per quarter

To submit, post on the Ed forum under the “Lectures” category

Something From Nothing

Unit I

Last time: going viral

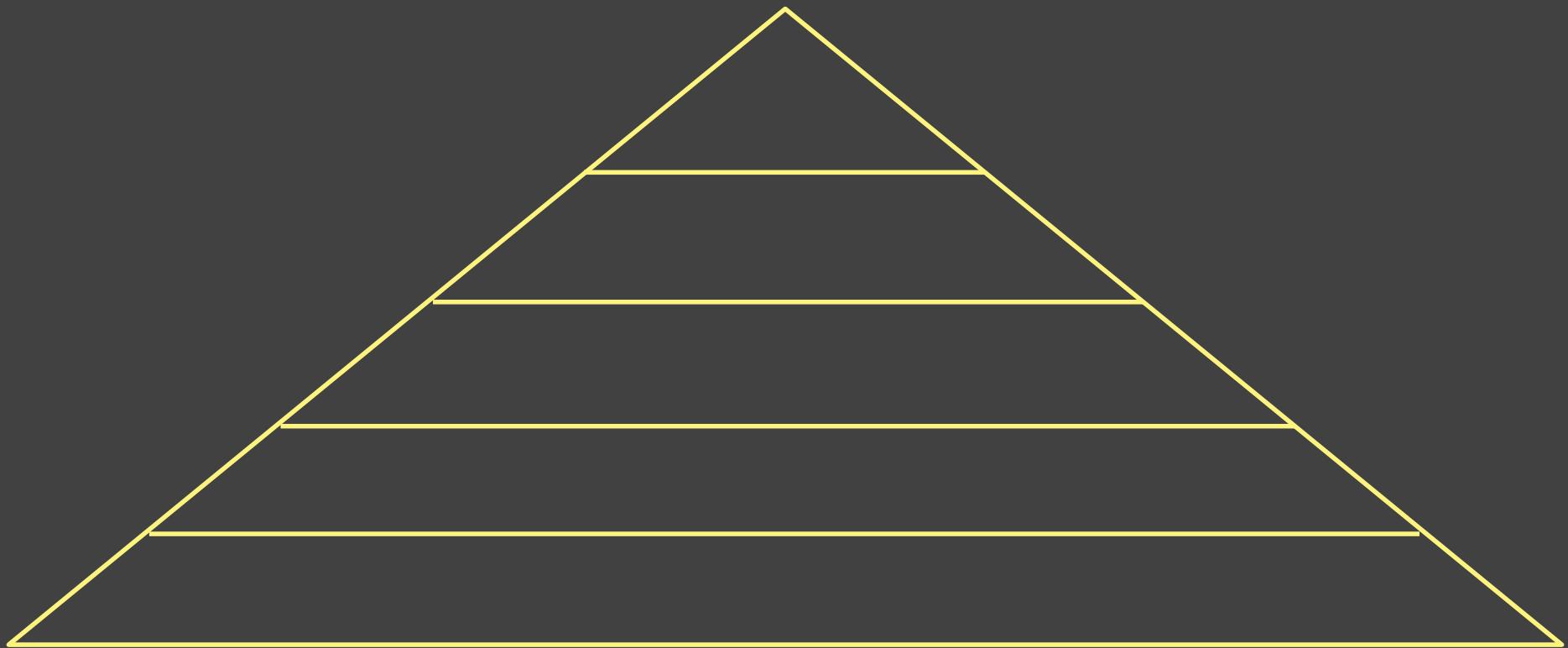
Virality and where cultural innovation comes from

Determinism vs. social influences in viral phenomena

Social proof

Truth spreads more weakly than fiction :(

Today, we will build up to this.



Eyes on the Street

[Jane Jacobs | 1961]

At a time when cities were considered nests of filth and trouble, Jane Jacobs unleashed a fierce defense of neighborhoods. She saw incredible value in her home, Greenwich Village in NYC.

Jacobs's argument: bustling city neighborhoods keep themselves interesting and safe

THE DEATH AND LIFE OF GREAT AMERICAN CITIES

JANE JACOBS

"Perhaps the most influential single work in the history of town planning...a work of literature."
—*The New York Times Book Review*

Eyes on the Street

[Jane Jacobs | 1961]

“There must be eyes upon the street, eyes belonging to those we might call the natural proprietors of the street.”

“Nobody enjoys sitting on a stoop or looking out a window at an empty street. Almost nobody does such a thing. Large numbers of people entertain themselves, off and on, by watching street activity.”

THE DEATH AND LIFE OF GREAT AMERICAN CITIES JANE JACOBS

“Perhaps the most influential single work in the history of town planning...a work of literature.”
—*The New York Times Book Review*

It can look different online.

Among open source projects that have produced successful and sustainable software, the median number of code contributors is

1

[Schweik and English 2012]



the loneliest number



the loneliest number =

1

Ghost towns

The New York Times

PLAY THE CROSSWORD

The Rise and Fall of Yik Yak, the Anonymous Messaging App

David Plunkert

engadget

— George R.R. Martin, the last great LiveJournal user, leaves the platform

Don't worry, he migrated his blog to his own site.

BBC Home News Sport Weather Shop More NEWS Technology Google shuts failed social network Google+ By Chris Fox Technology reporter

Almost Wikipedia

[Hill 2013]

At the time that Wikipedia was launched, there were seven other collaboratively edited online encyclopedias:

Interpedia

dead

Distributed Encyclopedia Project

gone

h2g2

quiet

The Info Network (TheInfo)

bye (but hi reddit)

Nupedia

pre-kipedia

Everything2

slow times

GNE

shut down

Why did these become ghost towns, and Wikipedia grew immense?

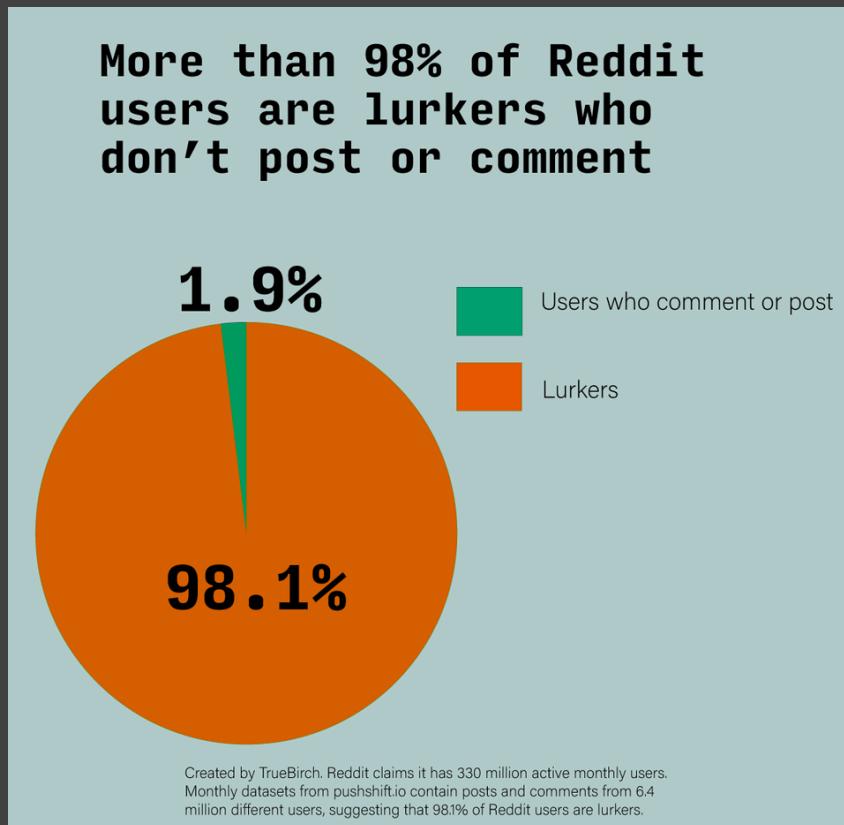
But even amongst success...

Active contributors make up only 0.02%–0.03% of all Wikipedia users

[https://strategy.wikimedia.org/wiki/Wikimedia_users]



But even amongst success...



Rank	SubReddit	Moderator
4	/r/gaming	Cyxie
5	/r/pics	Cyxie
10	/r/movies	Cyxie
14	/r/IAmA	Cyxie
17	/r/EarthPorn	Cyxie
24	/r/LifeProTips	Merari01, Awkwardtheturtle, Cyxie
25	/r/Art	Awkwardtheturtle
38	/r/tifu	Gallowboob, Merari01
49	/r/TwoXChromosomes	Awkwardtheturtle
50	/r/memes	Awkwardtheturtle
54	/r/wholesomememes	Awkwardtheturtle, Cyxie
60	/r/oddlysatisfying	Gallowboob, Cyxie
64	/r/facepalm	Gallowboob, Merari01, Cyxie
66	/r/dankmemes	Siouxsie_siousv2, Cyxie
71	/r/Whatcouldgowrong	Gallowboob, Cyxie

Four users moderate 25% of the most popular subreddits on Reddit
[@emollock]

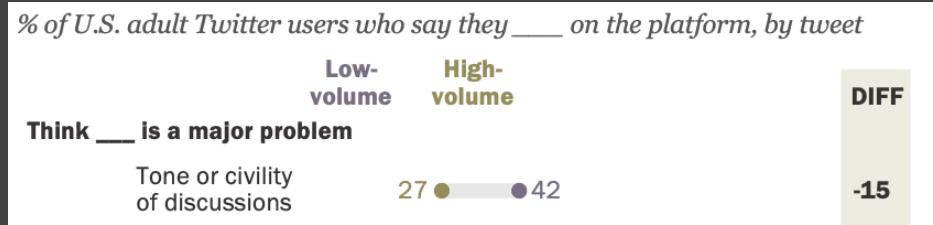
In the early years of Reddit, 91% of subreddits never reached 25 active users [Jordan Troutman]

[<http://redd.it/b5f9wi>; Nonnecke and Preece 2000]

But even amongst success...

The screenshot shows a dark-themed webpage from the Pew Research Center. At the top, there's a navigation bar with a menu icon, the text "Pew Research Center", and a search icon. Below the header, a breadcrumb trail reads "Home > Research Topics > Internet & Technology > ...". A timestamp "PEW RESEARCH CENTER | NOVEMBER 15, 2021" is visible. Social media sharing icons for Facebook, Twitter, LinkedIn, and Print are present. The main title "The Behaviors and Attitudes of U.S. Adults on Twitter" is displayed in large, bold, black font. A quote in italics follows: "A minority of Twitter users produce a majority of tweets from U.S. adults, and the most active tweeters are less likely to view the tone or civility of discussions as a major problem on the site". Below the quote, author information "BY COLLEEN MCCLAIN, REGINA WIDJAYA, GONZALO RIVERO AND AARON SMITH" is listed. A "TABLE OF CONTENTS" section is at the bottom.

produce the vast majority of content. An analysis of tweets by this representative sample of U.S. adult Twitter users from June 12 to Sept. 12, 2021, finds that the most active 25% of U.S. adults on Twitter by tweet volume produced 97% of all tweets from these users.



But even amongst success...



The screenshot shows a mobile version of The Atlantic's website. At the top, there is a navigation menu icon (three horizontal lines) and a large red letter 'A' logo with the word 'The Atlantic' underneath it. To the right of the logo is a 'Subscribe' button. Below the header, the text 'THE FACEBOOK PAPERS' appears in small red capital letters. The main title of the article is 'Facebook Has a Superuser-Supremacy Problem', displayed in a large, bold, black serif font. Underneath the title is a brief summary: 'Most public activity on the platform comes from a tiny hyperactive group of abusive users. Facebook relies on them to decide what everyone sees.' Below the summary is the author's name: 'By Matthew Hindman, Nathaniel Lubin, and Trevor Davis'. At the bottom of the screenshot is a colorful illustration of a yellow sun-like object with blue, tangled lines extending from its surface, set against a red background.

Feed algorithms often rely on observable behavioral signals. So who is providing those signals?

So it's not surprising when:



From: thatonefriend@stanford.edu

To: dormlist@lists.stanford.edu

Hey everyone,

Check out this site I made called Ways of WAYSing! It's for reviewing and recommendingWAYS-fulfilling courses on campus.
- A person you know

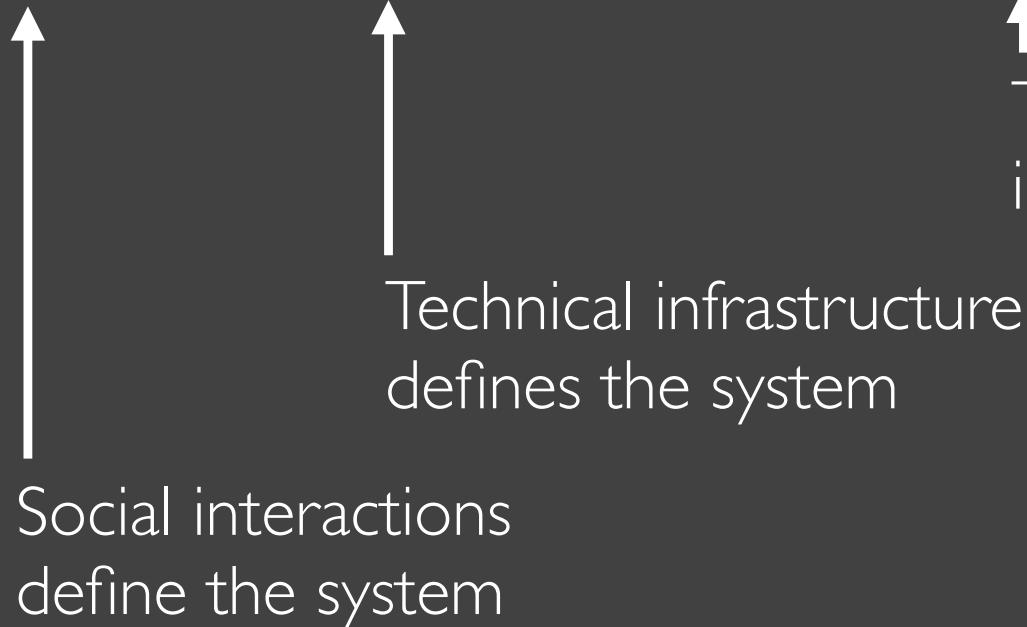
[deafening silence and no activity]

Today's question

How do I design environments that are bustling — promoting eyes on the street — and not ghost towns? And do so in a responsible way?

To answer this, let's get concrete with a definition.

Sociotechnical system



The two components are
interrelated and both responsible

Sociotechnical system

Why we use this term: it captures that the technical elements of the system are not enough to determine its behavior or outcomes.

Wikis don't imply Wikipedia as the outcome

Short text messages don't imply Twitter as the outcome

“Sociotechnical systems” emphasizes that it's the interplay of the tech and the people in the system that make it tick.

That said, now an outline of an answer to the question

individual factors

intrinsic and extrinsic motivation

channel factors

social factors

social loafing

reciprocity

contribution pyramid

(For more,
take social
psych)

Individual factors

Motivation: why are you here?

Why do people contribute to...

Ed forums?

Instagram?

Dorm email lists?

Fizz?

People have lots of pressing things to do with their time. So we need to ask critically: why are they spending time in this socio-technical system?

Intrinsic and extrinsic motivation

The distinction between intrinsic and extrinsic motivators helps clarify who is here, why, and what it implies for design.

Intrinsic motivation: derive from my own desires to complete a goal

Examples: pleasure, hobby, developing a skill, demonstrating a skill

Extrinsic motivation: don't derive from my relationship with the goal

Examples: money, graduation, points, badges

Intrinsic / Extrinsic

Which motivation is each of these most likely to tap into? [2min]

Posting your music to Soundcloud as a new artist

Answering someone's question on Stack Overflow

Creating memes for the Stanford memes Facebook group

Streaming a session for a successful Twitch streamer

Motivation crowding

Mixing motivators is dangerous: taking an intrinsically motivated goal and adding extrinsic motivators to it may actually **reduce** the overall motivation level.



1. Late parents are shamed
2. A fine is instituted.
Lateness increases!
3. The fine is removed.
Lateness remains!

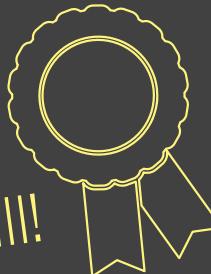
[Gneezy and Rustichini 2000]

This is the (a?) problem with gamification.

937 more to become Pro!

Help this person solve their problem!

You've unlocked a new Solve skill!

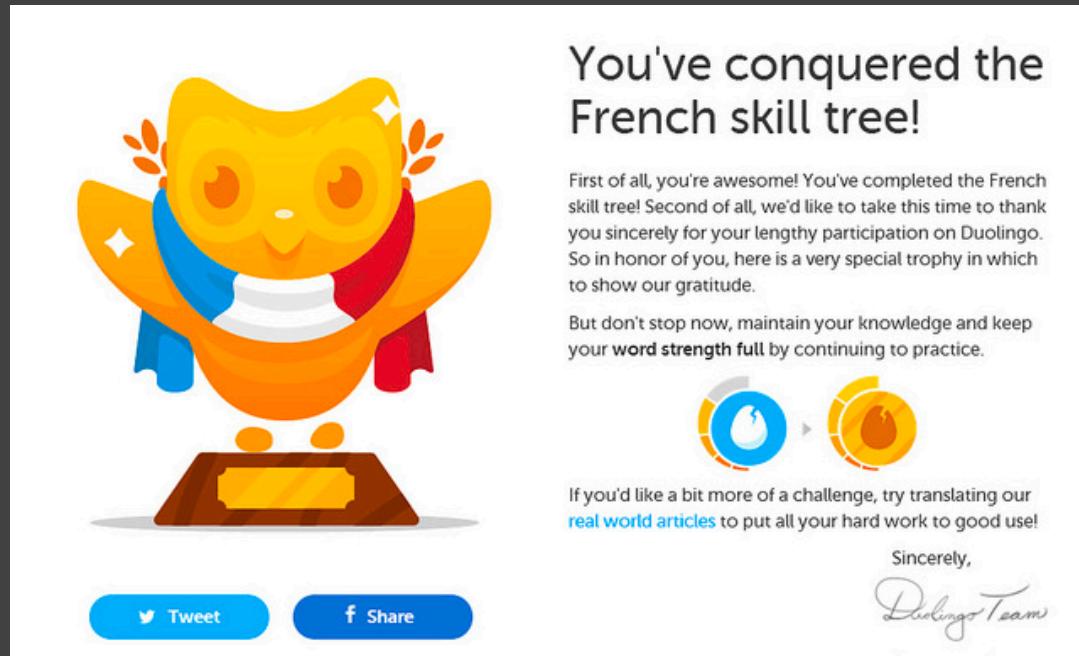


HIT A STREAK OF 4
ANSWERS TO
UNLOCK WHAT THEY
REALLY THINK OF YOU

+10 Helper Points

Unwise application of extrinsic motivators.

Some do this better



A screenshot of a Duolingo achievement notification. On the left is a yellow owl-like character wearing a blue and red sash, standing on a wooden plaque. The text on the right reads: "You've conquered the French skill tree! First of all, you're awesome! You've completed the French skill tree! Second of all, we'd like to take this time to thank you sincerely for your lengthy participation on Duolingo. So in honor of you, here is a very special trophy in which to show our gratitude. But don't stop now, maintain your knowledge and keep your word strength full by continuing to practice." Below this are two circular icons, one blue with a water droplet and one orange with a flame. The text continues: "If you'd like a bit more of a challenge, try translating our [real world articles](#) to put all your hard work to good use!" A signature at the bottom right reads "Sincerely, Duolingo Team". At the bottom are "Tweet" and "Share" buttons.

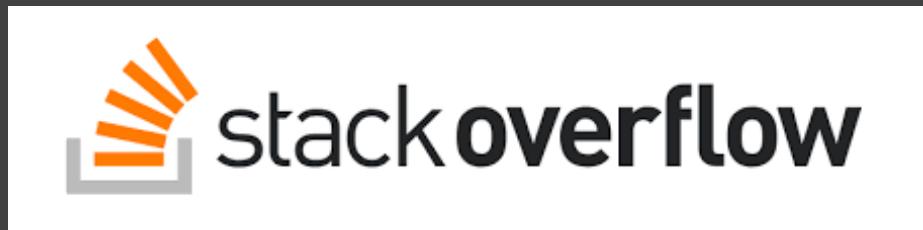
Why does Duolingo's use of gamification, badges, streaks, etc., not feel like it's crowding out the intrinsic learning motivation?

Michael's opinion:

1. Language learning is, for most, a weak intrinsic motivation
2. Autonomy: I signed up for this

Transition points

Michael's recommendation: start by letting people exercise intrinsic motivation. As they become invested, allow them to go after extrinsic motivators.



Step 1: Ask, answer, and edit! Go help people!

Step 2: Get badges to hit milestones; measure and grow your impact

Commitment Loops

Adapted from Will Wright, creator of The Sims [Wright 2003]



Don't design around an assumption
that new users will come and put
significant time into creating
content

Commitment Loops

Adapted from Will Wright, creator of The Sims [Wright 2003]



First loop: 60 seconds to communicate what this is, what they should do, and make them feel like they achieved something or benefited

Commitment Loops

Adapted from Will Wright, creator of The Sims [Wright 2003]



First loop: 60 seconds

Second loop: 5 minutes to achieve something more compelling

Third loop: 30 minutes

Fourth loop: 60 minutes
&etc.

Effort: channel factors

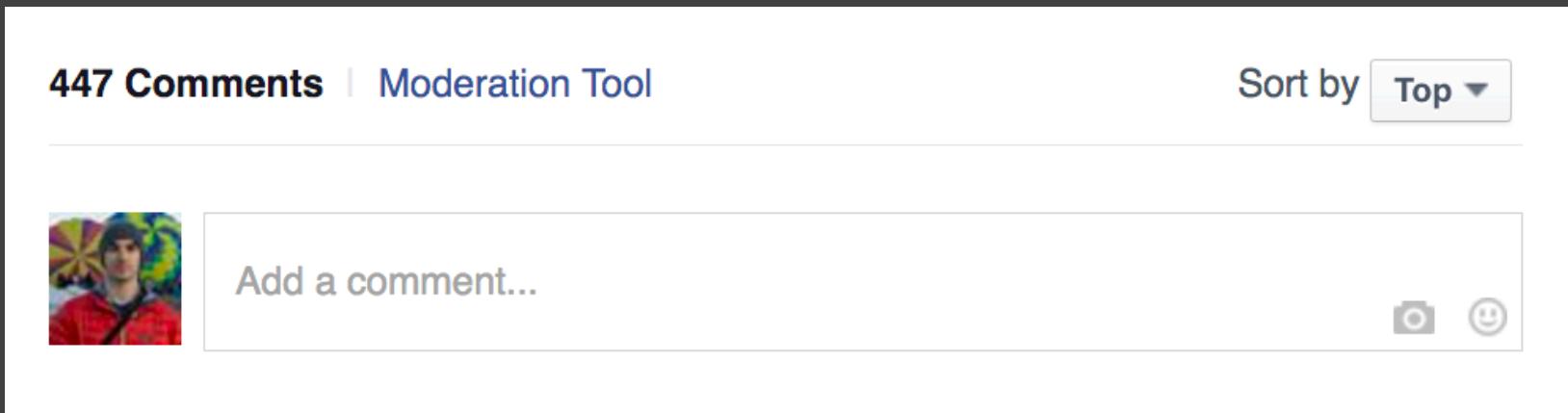
We are, in general, extremely reactive to small changes in the amount of effort required to contribute.

Channel factors: minor features upstream in a decision process that can produce large changes in behavior downstream [Ross and Nisbett 1991]. They are behavioral catalysts.

Students asked to get a tetanus shot were more likely to do it if they got a map to point out where the health center was, and a written list of its hours of operation. They already knew both of these facts. [Leventhal et al. 1965]

Effort: channel factors

Massive impact on the social web of changing this:



A screenshot of a social media moderation interface. At the top left, it says "447 Comments" and "Moderation Tool". At the top right, there is a "Sort by" dropdown set to "Top". Below this, there is a list of comments. The first comment is partially visible, showing a profile picture of a person with dark hair and a red patterned shirt, followed by the text "Add a comment...". To the right of the input field are two small icons: a camera and a smiley face.

Into this:

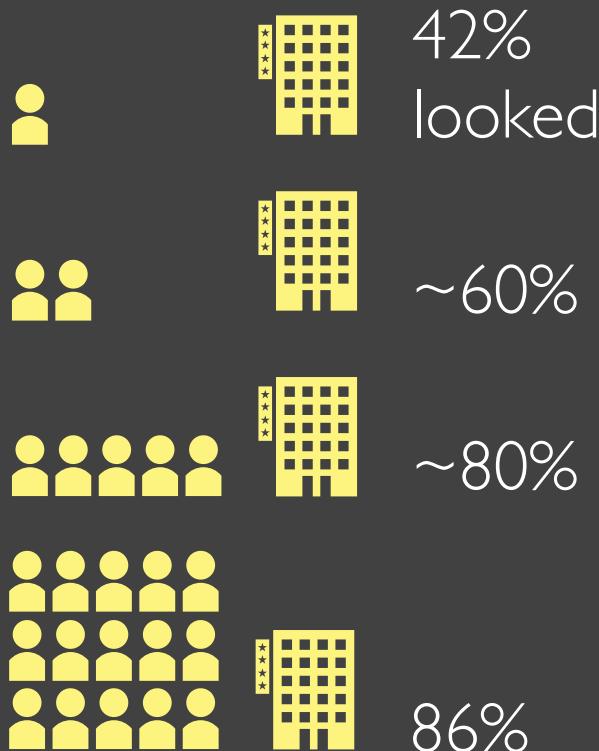


(But also important costs! Let's talk about honest signals later.)

Social factors

Social proof

Remember this?



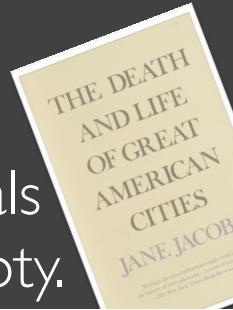
Using log data from 140k Facebook newcomers who lurk, what best predicts long-term sharing?

Seeing friends actively contribute.
[Burke, Marlow, and Lento 2009]

Survey: what percent of your Facebook friends do you think actively check Facebook?

2 Among U.S. adults who use Facebook, seven-in-ten say they visit the site daily, including around half (49%) who do so several times a day. By comparison, 59% of both Snapchat and Instagram users say they visit these platforms at least daily, as do 54% of YouTube users and 46% of Twitter users.

Why do we underestimate?
The design signals make it feel empty.



Social Loafing

Many hands make...work...light?

When there are others contributing, we contribute less.

Experiment: blindfold a participant and get them to play team tug-of-war. [Ingham 1974]

Except...there is actually nobody else on their team, they just think so.
(Remember, they're blindfolded.)

People pulled 18% harder when they thought they were the only one on their team than when they thought there were 2–5 others.

When was the last time you edited Wikipedia?

As a social computing system shows more activity, do we paradoxically get fewer eyes on the street?

Don't shame or nudge people as your solution to social loafing :(

Instead, call out the person's uniqueness, and help them set goals. [Kraut and Resnick 2012]



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Social computing

From Wikipedia, the free encyclopedia

Social computing is an area of [computer science](#) that is concerned with computational systems. It is based on creating or recreating social convergence of software and technology. Thus, [blogs](#), [email](#), [instant messaging](#), [social bookmarking](#) and other instances of what is often called social software are examples of social computing.

- 1 [History](#)
- 2 [Background](#)
 - 2.1 [Technology](#)
- 3 [Theoretical Foundations](#)
- 4 [Social Software](#)
 - 4.1 [Social media](#)
 - 4.2 [Social networks](#)
 - 4.3 [Wiki page](#)
 - 4.4 [Blogs](#)
 - 4.5 [Online gaming](#)
 - 4.6 [Online dating](#)
- 5 [Socially Intelligent Computing](#)
 - 5.1 [Crowdsourcing](#)
 - 5.2 [Dark social media](#)
- 6 [Social Science Theories](#)
 - 6.1 [Collective intelligence](#)

We need people who took a social computing class to fill in this section on motivation!

Reciprocity

You are more willing to give back when someone does a favor for you. Even if you didn't ask for the favor!

Experiment [Regan 1971]: in the context of another task, your partner goes out for a bathroom break. They either come back as normal, or bring a soda back for you.

Participants in the unasked-for soda condition later bought more raffle tickets for their partners.

Notifications



Paul W. Swansen commented on your status.

10 minutes ago



Paul W. Swansen tagged a photo of you.

11 minutes ago



Marty Kind commented on his link.

16 hours ago

62 friends posted on Brian's timeline for his birthday.



Brian

Birthday: Yesterday

You wrote on Brian's timeline.

When done well, positive social reciprocity loops can be natural and unforced.



Sanjay ► Brian

9 hrs ·

Happy bday Brian!!

[Like](#) · [Comment](#)



Brian

likes this.



Write a comment...



Contribution pyramid

A common mistake



From: thatonefriend@stanford.edu

To: dormlist@lists.stanford.edu

Hey everyone,

Check out this site I made called Ways of WAYSing! It's for reviewing and recommendingWAYS-fulfilling courses on campus.

- A person you know

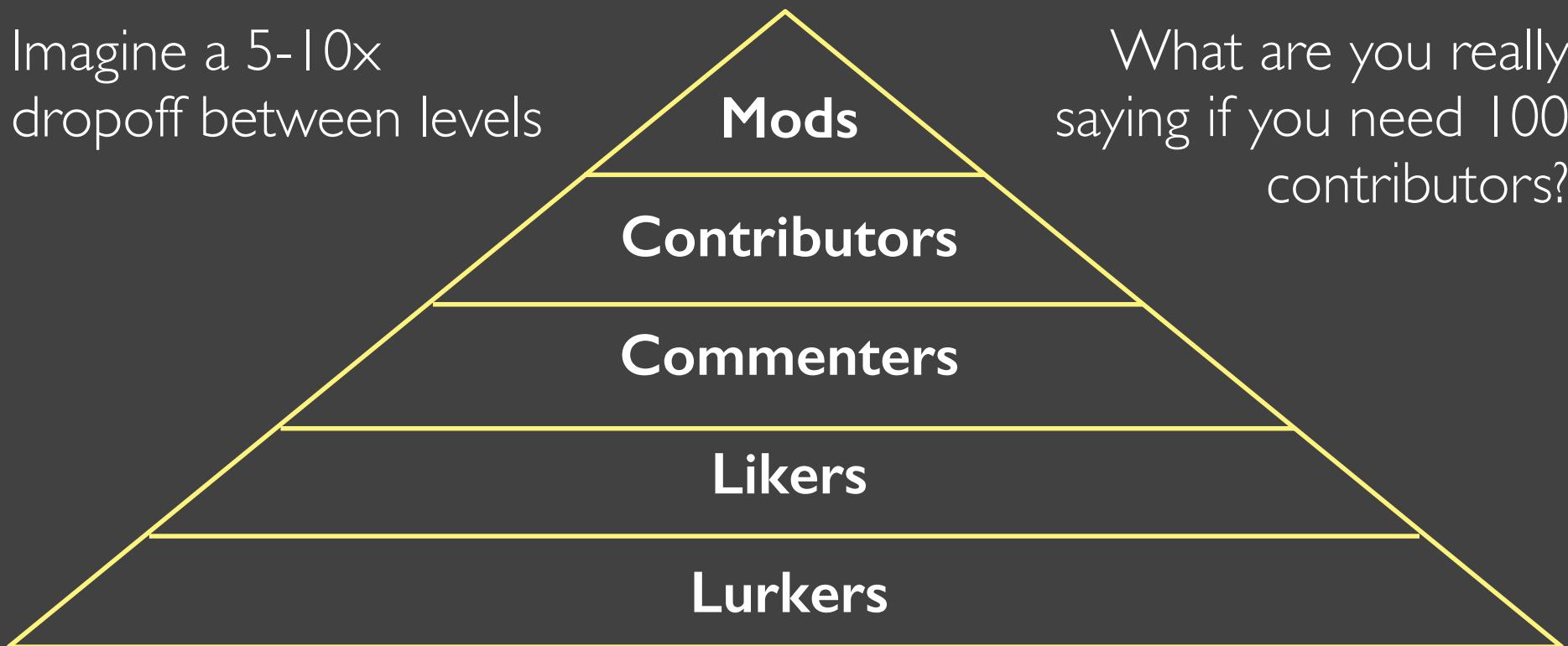
= “We’re going to have 100 people contributing reviews of offices!”

= “We need 100 users!”

MSB's hierarchy of contributions

Imagine a 5-10x
dropoff between levels

What are you really
saying if you need 100
contributors?



Motivation vs. Manipulation

How do we do this responsibly? We don't want to be just engagement hacking. [2min]

Michael's answer: autonomy

Ask yourself: do they have autonomy in this design? Do they know what's happening, and have the ability to control it?

Think about the difference between agreeing to enroll in a tough self-improvement regimen, vs. being nudged and manipulated to do so without your awareness or consent

Summary



How do I design environments that are bustling, not ghost towns?

Support the intrinsic or extrinsic motivations we bring to the system

Identify channel factors that impact behavior and manage them carefully

Combat social loafing and encourage positive reciprocal relationships

Support autonomy and user/community control in whatever you design

OK but seriously Michael, why is my system full of lurkers?

Actually, that's natural. Contributions are generally unequal. Recognize it and design around that assumption.

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