



# Bustling Streets and Ghost Towns

CS 278 | Stanford University | Michael Bernstein



Attendance



# Discussion section signups

Sign up by Tuesday at 11:59 PT via the link at [cs278.stanford.edu](https://cs278.stanford.edu).

Sign up together with a project group if you have one, or solo if you're looking for partners

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 next Tuesday 11:59pm

First reading for section will be due next Wednesday 11:59pm

The file will be posted on Canvas

# Extra credit for examples

At the staff's discretion, we'll give out **0.5% extra credit** to students who suggest **real-world examples** of class concepts

Criterion: The staff deem it high-enough quality that we will try and integrate it into a future year's version of the lecture

Up to 0.5% per example; max 2.5% per student per quarter

To submit, **post on the Ed forum** under the "Lectures" category



# Something From Nothing

Unit I



# Last time: going viral

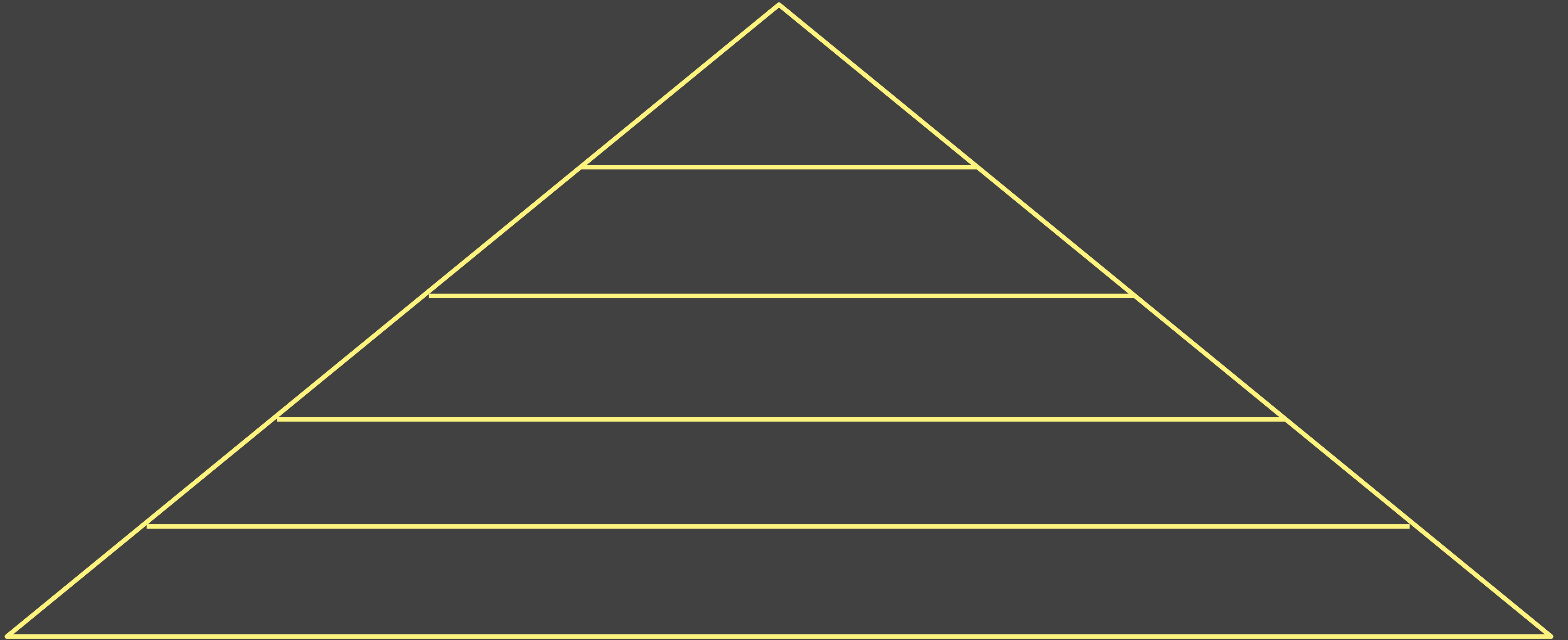
Virality and the sources of cultural innovation

Determinism vs. social influences in viral phenomena

Social proof



**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 urban neighborhoods. She saw incredible value in her home, Greenwich Village in NYC.

Jacobs's argument: bustling urban 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

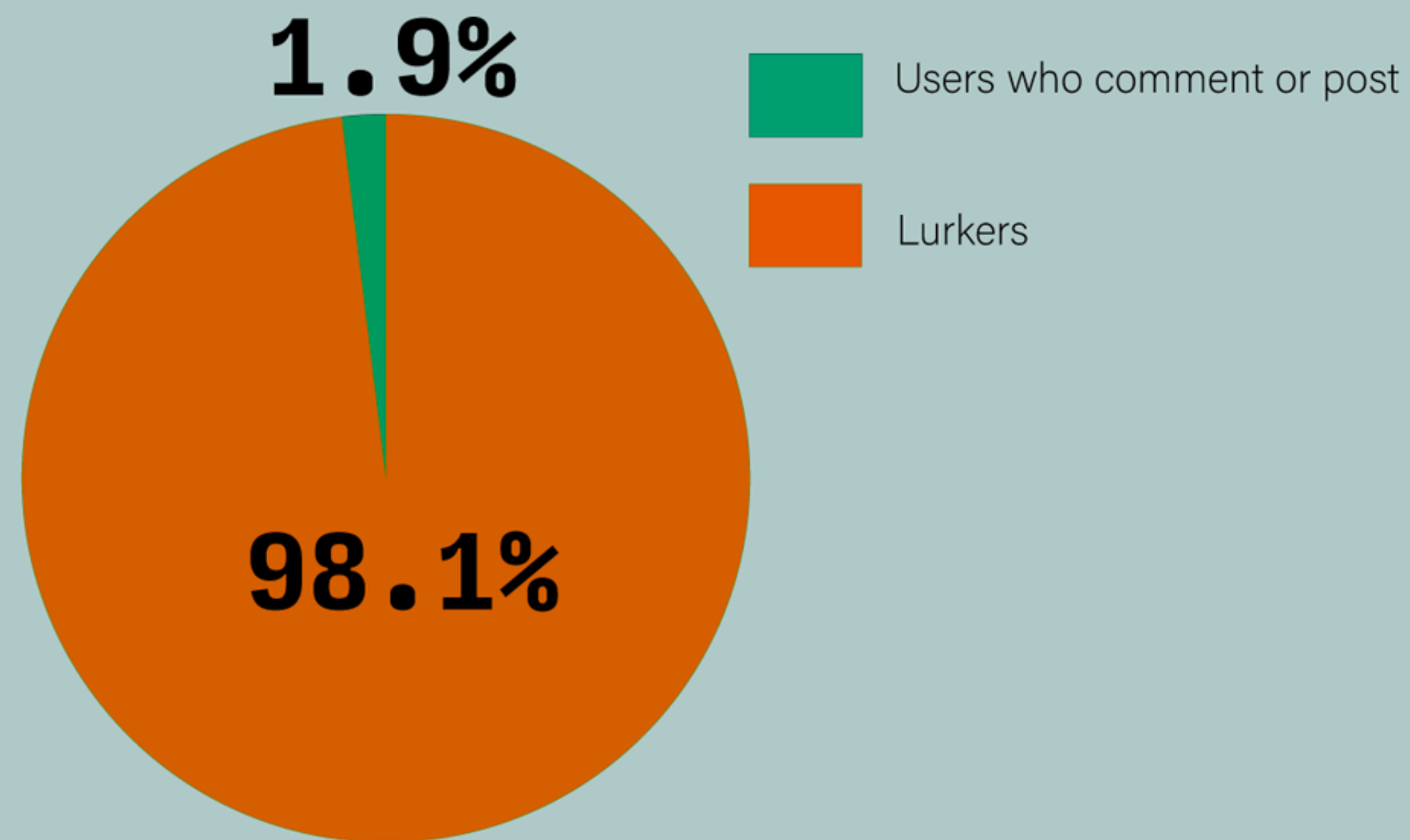
[[https://strategy.wikimedia.org/wiki/Wikimedia\\_users](https://strategy.wikimedia.org/wiki/Wikimedia_users)]





# But even amongst success...

More than 98% of Reddit users are lurkers who don't post or comment



Created by TrueBirch. Reddit claims it has 330 million active monthly users. Monthly datasets from pushshift.io contain posts and comments from 6.4 million different users, suggesting that 98.1% of Reddit users are lurkers.



Twitter is rolling out View Count, so you can see how many times a tweet has been seen! This is normal for video.

Shows how much more alive Twitter is than it may seem, as over 90% of Twitter users read, but don't tweet, reply or like, as those are public actions.

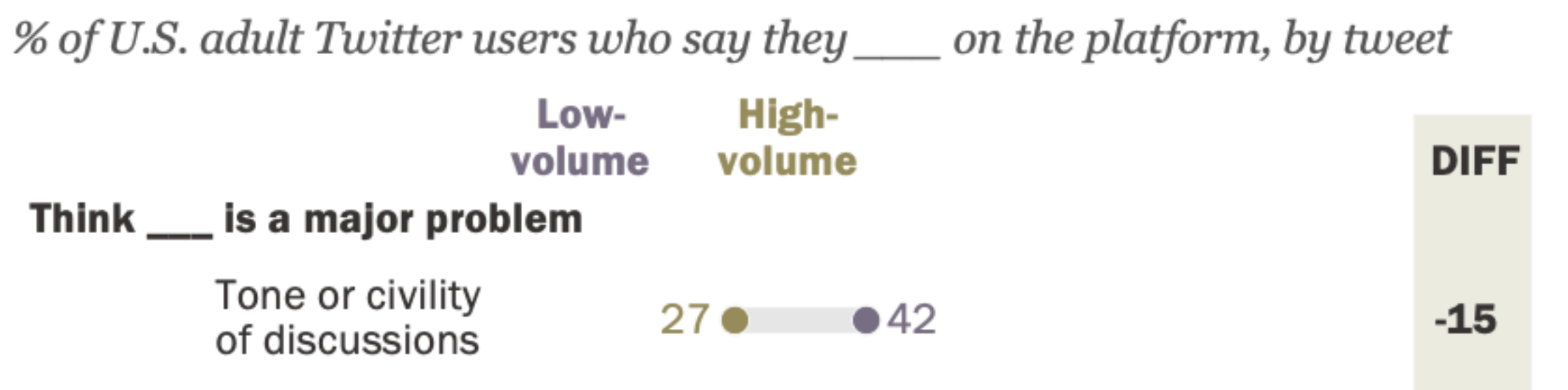
Rank	SubReddit	Moderator
4	<a href="#">/r/gaming</a>	Cyxie
5	<a href="#">/r/pics</a>	Cyxie
10	<a href="#">/r/movies</a>	Cyxie
14	<a href="#">/r/IAmA</a>	Cyxie
17	<a href="#">/r/EarthPorn</a>	Cyxie
24	<a href="#">/r/LifeProTips</a>	Merari01, Awkwardtheturtle, Cyxie
25	<a href="#">/r/Art</a>	Awkwardtheturtle
38	<a href="#">/r/tifu</a>	Gallowboob, Merari01
49	<a href="#">/r/TwoXChromosomes</a>	Awkwardtheturtle
50	<a href="#">/r/memes</a>	Awkwardtheturtle
54	<a href="#">/r/wholesomememes</a>	Awkwardtheturtle, Cyxie
60	<a href="#">/r/oddlysatisfying</a>	Gallowboob, Cyxie
64	<a href="#">/r/facepalm</a>	Gallowboob, Merari01, Cyxie

Four people moderate 25% of the most popular subreddits on Reddit

[@emollock]

# Active users are not typical

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.**



Home > Research Topics > Internet & Technology > ...

PEW RESEARCH CENTER | NOVEMBER 15, 2021



## The Behaviors and Attitudes of U.S. Adults on Twitter

*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*

BY COLLEEN MCCLAIN, REGINA WIDJAYA, GONZALO RIVERO AND AARON SMITH

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# Active users skew AI



The screenshot shows the top of a web page from The Atlantic. On the left is a hamburger menu icon. In the center is the Atlantic logo, a red letter 'A' above the text 'The Atlantic'. On the right is a red 'Subscribe' button. Below the logo is the sub-header 'THE FACEBOOK PAPERS' in red. The main title is 'Facebook Has a Superuser-Supremacy Problem' in a large black serif font. Below the title is a paragraph: 'Most public activity on the platform comes from a tiny, hyperactive group of abusive users. Facebook relies on them to decide what everyone sees.' An arrow points from this paragraph to the text on the right. Below the paragraph is the byline: 'By Matthew Hindman, Nathaniel Lubin, and Trevor Davis'. At the bottom is a red banner with a yellow and blue illustration of a person's head with tangled blue lines representing data or activity, and a smartphone in the bottom left corner.

Subscribe

A

*The Atlantic*

THE FACEBOOK PAPERS

## Facebook Has a Superuser-Supremacy Problem

Most public activity on the platform comes from a tiny, hyperactive group of abusive users. Facebook relies on them to decide what everyone sees.

By Matthew Hindman, Nathaniel Lubin, and Trevor Davis

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



# Need I go on?

62% of members of an online health support forum never log in again after their first day or participation [Yao et al. 2021]

19% of online groups have no activity after the day of their creation [Kraut and Fiore 2014]


40% of WeChat groups cease interaction within a week [Qui et al. 2016]

Two thirds of new Facebook members never post in their first two weeks on the platform [Burke, Marlow, and Lento 2009]



68% of newcomers to Usenet are never seen again after their first post [Kraut, Burke, and Riedl 2012]



46% of MMORPG guild members leave within a month [Kraut, Burke, and Riedl 2012]

40% of posts on 4chan get no replies [Bernstein et al. 2010]

Menu **NN/g** Nielsen Norman Group 

## The 90-9-1 Rule for Participation Inequality in Social Media and Online Communities

 **WIKIPEDIA**  
The Free Encyclopedia  

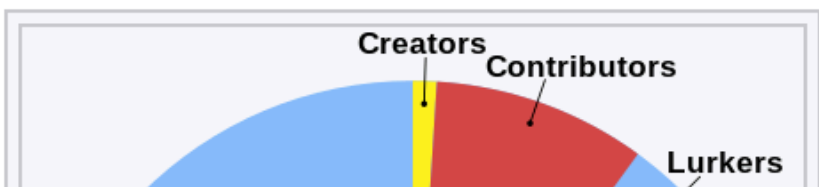
 **1% rule**  26 languages 

Article [Talk](#)  Tools 

From Wikipedia, the free encyclopedia

*For the aviation medicine rule, see [1% rule \(aviation medicine\)](#).*

In [Internet culture](#), the **1% rule** is a general [rule of thumb](#) pertaining to participation in an



Category	Percentage
Creators	1%
Contributors	9%
Lurkers	90%



# So it's not surprising when:



**Michael Mernstein** 5:29pm

**@channel** Check out this site I made called LetsHang! It's a site where you post interest in going out and doing something, and people can sign up. <http://lets-hang.ai>



[deafening silence and no activity]



# Today's question

How do we 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



Social interactions  
define the system



Technical infrastructure  
defines the 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

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 Slacks?

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

Sharing memes with your friends

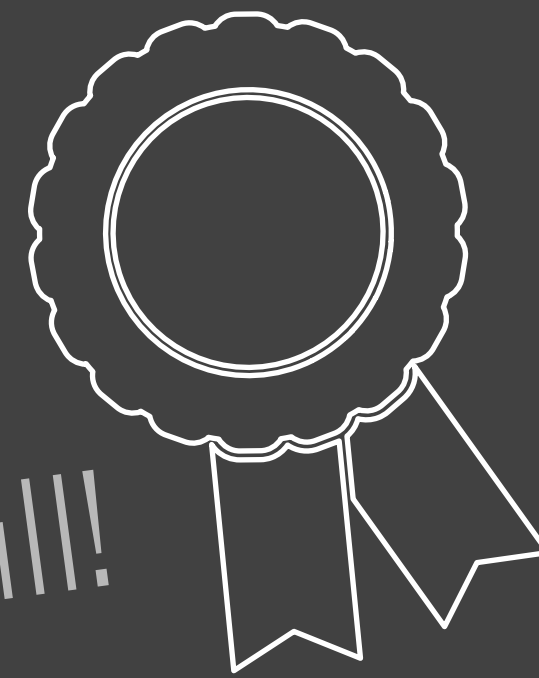
Streaming a session for a successful Twitch streamer

# This is why gamification can feel fake.

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  
REVEAL WHAT  
BERNSTEIN  
REALLY THINKS OF  
YOU

+10 Helper Points

Application of weak extrinsic motivators while you have no intrinsic motivation




# Some do this better



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.



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!

Sincerely,  
*Duolingo Team*

[Tweet](#) [Share](#)

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

Michael's opinion: the extrinsic motivators aren't actually the active ingredient; it's the bite-sized lessons feeding an intrinsic motivation of mastery

# 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 from the start

# Commitment Loops

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



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



# Commitment Loops

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



First loop: you have 60 seconds

Second loop: you have 5 minutes  
to experience or achieve  
something even more compelling  
—again intrinsic motivation

# Commitment Loops

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



First loop: you have 60 seconds

Second loop: you have 5 minutes

Third loop: you have 20 minutes

Fourth loop: you have one hour

&etc.

Only after people are committed  
should extrinsic motivator loops kick in. <sup>33</sup>



# But: motivation crowding

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



1. Late parents are shamed

2. A fine is instituted.  
Lateness increases!

3. The fine is removed.  
Lateness remains!

# Risks of motivation crowding

Begin with intrinsic motivation:  
Love of the game



Gain extrinsic motivation:  
Followers or subscribers



Motivation crowding: —————>  
Lessen intrinsic motivation







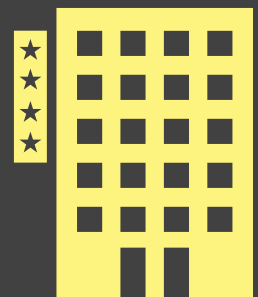
**Social factors**

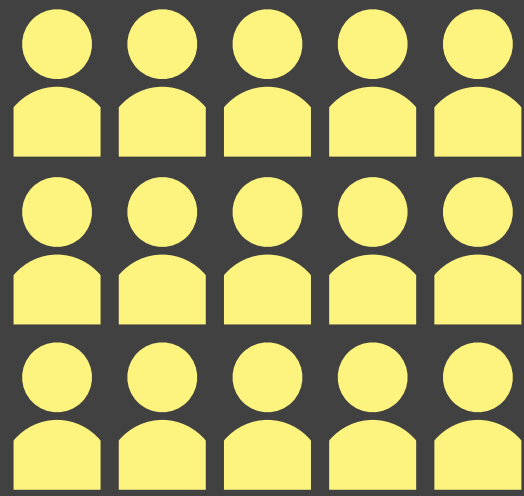
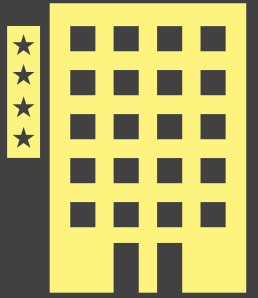
# Social proof

Remember this?

  42%  
looked

  ~60%

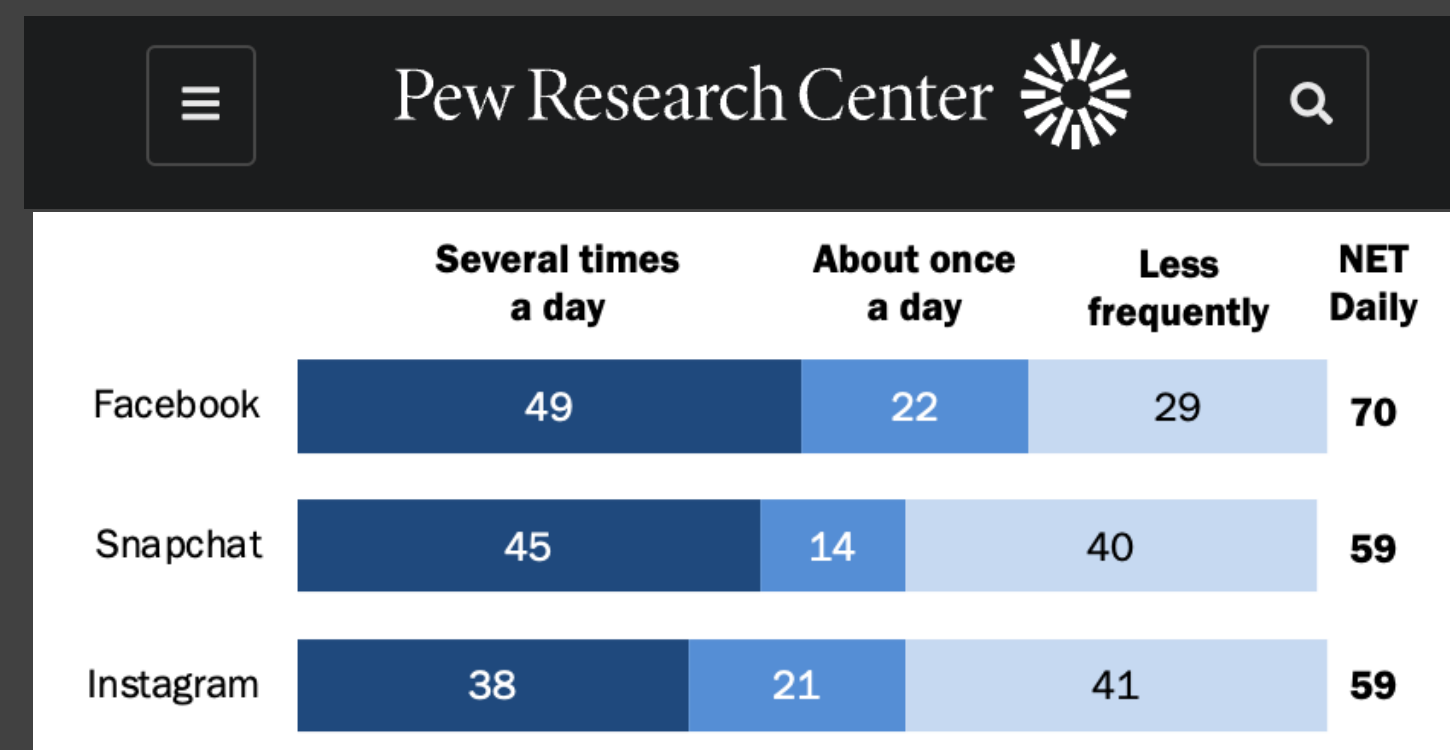
  ~80%

  86%

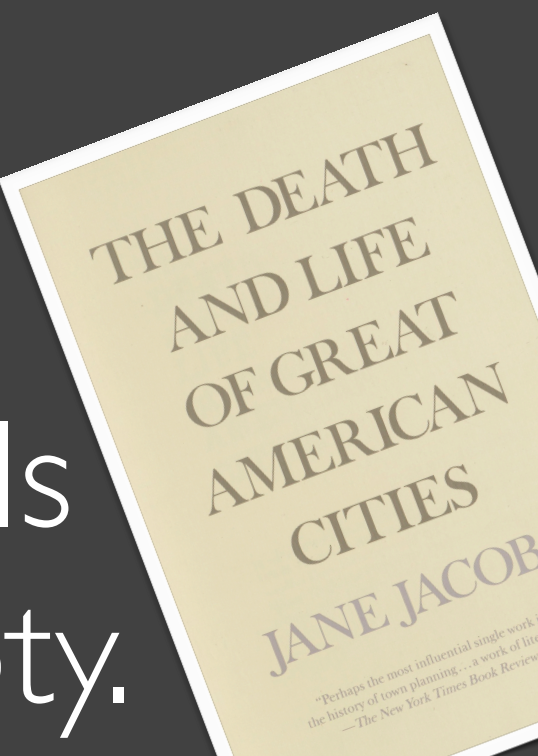
Using log data from 140k Facebook newcomers who lurk, what best predicts long-term sharing?

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

Survey: what percent of your Instagram friends do you think check Instagram daily?

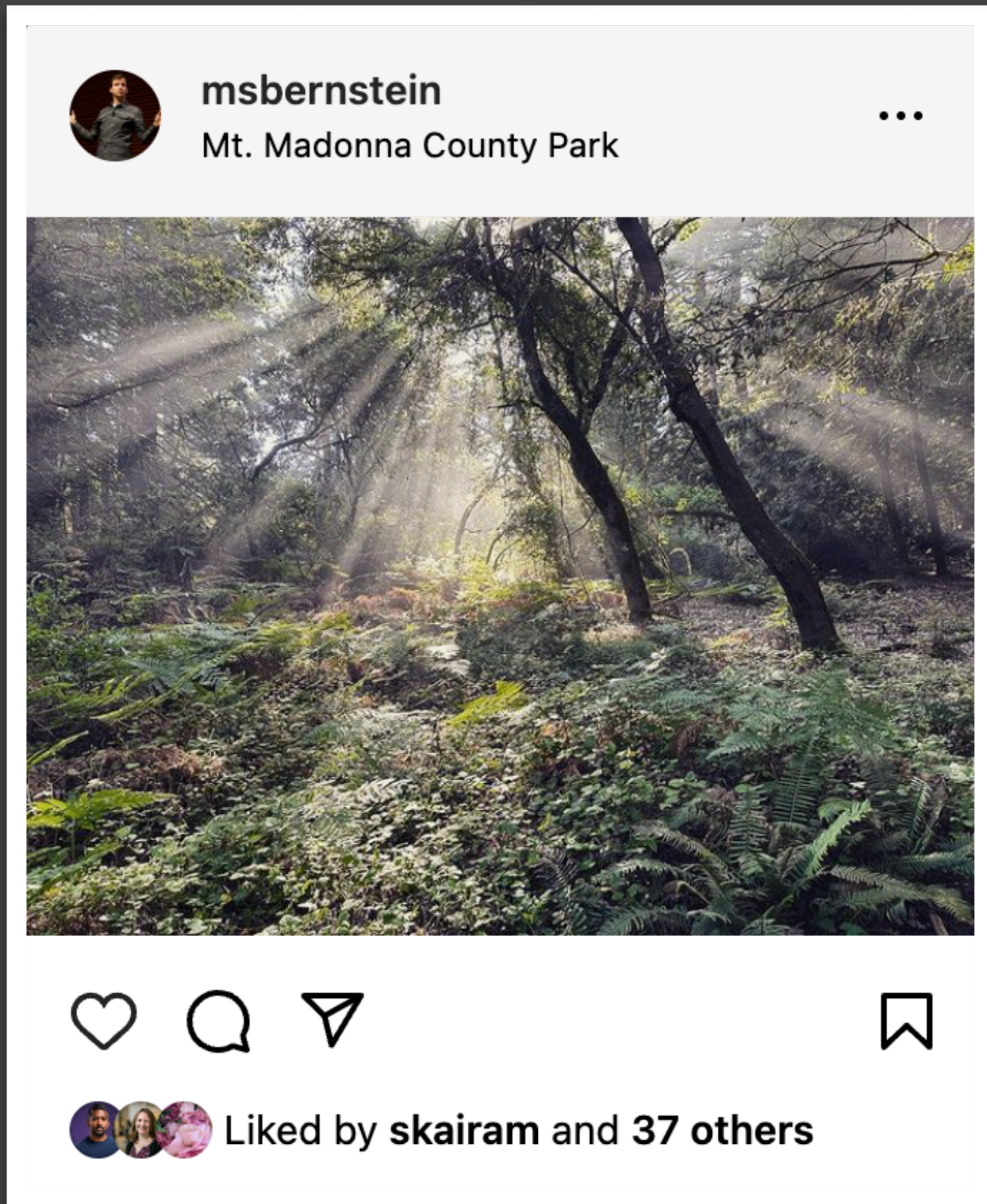


Why do we underestimate?  
The design signals make it feel empty.





# Social proof in practice



Retaining a form of social proof while reducing anxiety by removing like counts



# 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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The Free Encyclopedia

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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 conventions of software and technology. Thus, [blogs](#), [email](#), [instant messaging](#), [social bookmarking](#) and other instances of what is often called social software include

- [1 History](#)
- [2 Background](#)
  - [2.1 Technology](#)
- [3 Theoretical Foundations](#)
- [4 Social Software](#)
  - [4.1 Social media](#)
  - [4.2 Social networks](#)
  - [4.3 Wiki pages](#)
  - [4.4 Blogs](#)
  - [4.5 Online games](#)
  - [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.





New post

Share



When @landay asks, you say yes.

Tag people

landay >

Tag products



Add reminder



Add location



Share to Facebook



Sharing as Michael Bernstein. Audience is Friends.

Advanced settings



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

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



**Brian**

Birthday: Yesterday

You wrote on Brian's timeline.



**Sanjay** ▶ **Brian**

9 hrs · 👤

Happy bday Brian!!

Like · Comment



Brian

likes this.



Write a comment...



# Contribution pyramid



# A common mistake



**Michael Mernstein** 5:29pm

**@channel** Check out this site I made called LetsHang! It's a site where you post interest in going out and doing something, and people can sign up. <http://lets-hang.ai>

= “We’re going to have 100 people contributing hangouts!”

= “We need 100 users!”



# A common mistake



**Elon Musk**    
@elonmusk

**Subscribe**



I meet so many people who read twitter every day, but almost never tweet.

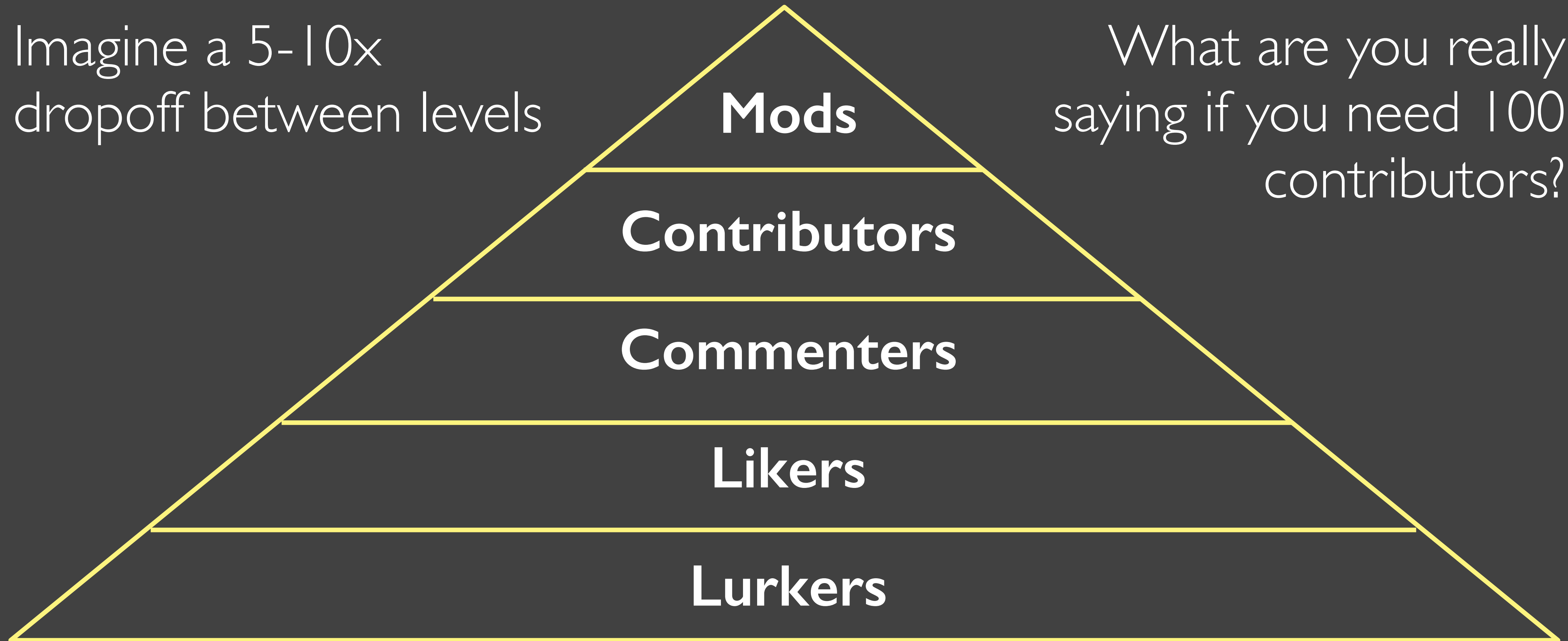
If I may beg your indulgence, please add your voice to the public dialogue!



# 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.



Attendance



Attendance



Attendance Beta Test



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# Social Computing

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