November 14, 13.00
Utrecht

#WOinACTIE
TEGEN AFBRAAK VAN HET WO

Save the date:
On November 14th we protest.

The current Dutch government is planning:
Caps on the influx of international talent
Fines for taking longer to complete a degree
Destructive cancellations of previously agreed research funding

Take action to save Dutch higher education and research!

Joint the protest on Nov 14th!

And help mobilize fellow Leiden students by contacting your assessor, your representatives in the faculty council or the university council

TAKE CARE

In this lecture:

Discussion of and survey data about mental health, including brief mentions of suicide and self-harm

Struggling with mental health or well-being in general? You're not alone!
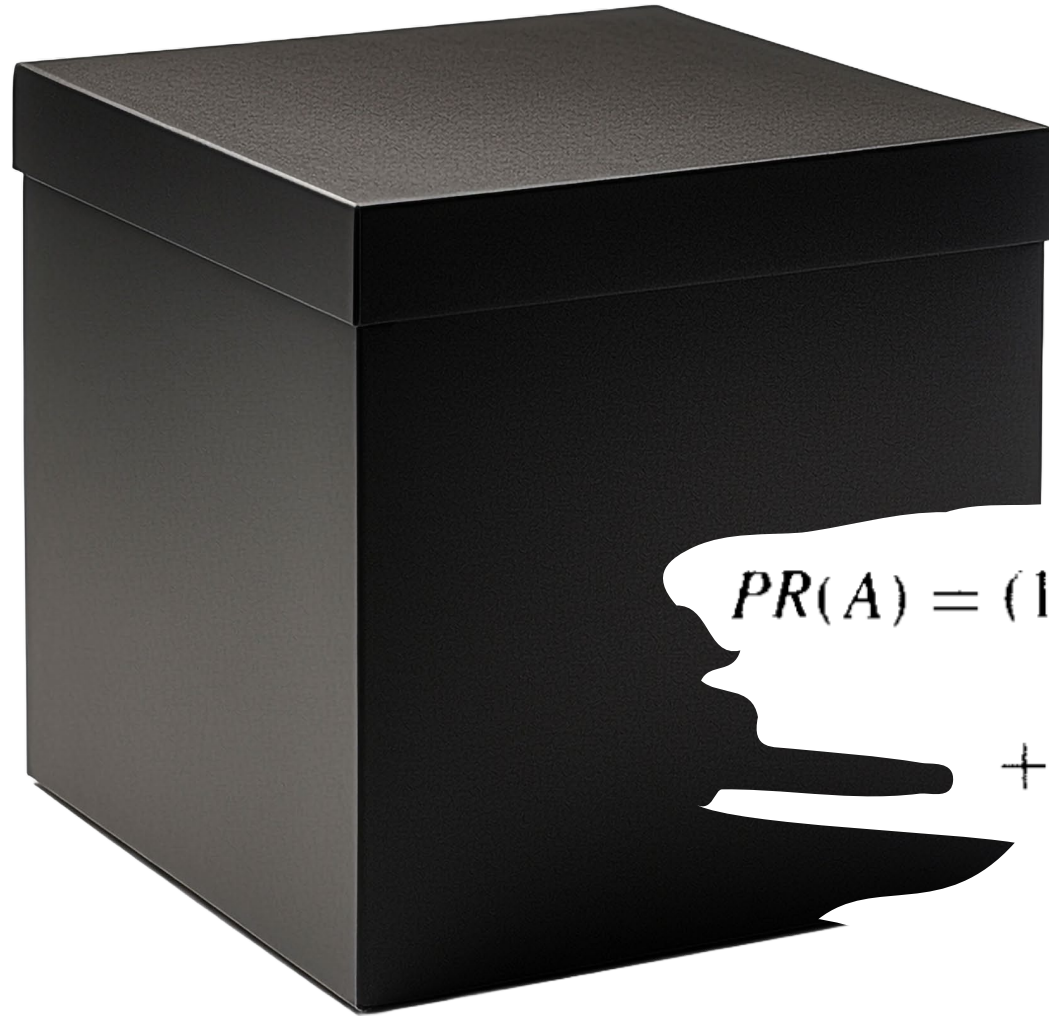
Leiden University resources available here: tinyurl.com/wellbeing-LU

Suicide Prevention Helpline The Netherlands (anonymous): Call 113

Digital Media, Society, and Culture

Angus A. A. Mol

$$PR(A) = (1 - d)$$

$$+ d\left(\frac{PR(T1)}{C(T1)} + \ldots + \frac{PR(Tn)}{C(Tn)}\right)$$

Algorithmic Culture

What is an Algorithm?

"A finite sequence of mathematically rigorous instructions, typically used to solve a class of specific problems or to perform a computation."
~Wikipedia

"An *algorithm* is a finite, abstract, effective, compound control structure, imperatively given, accomplishing a given purpose under given provisions."
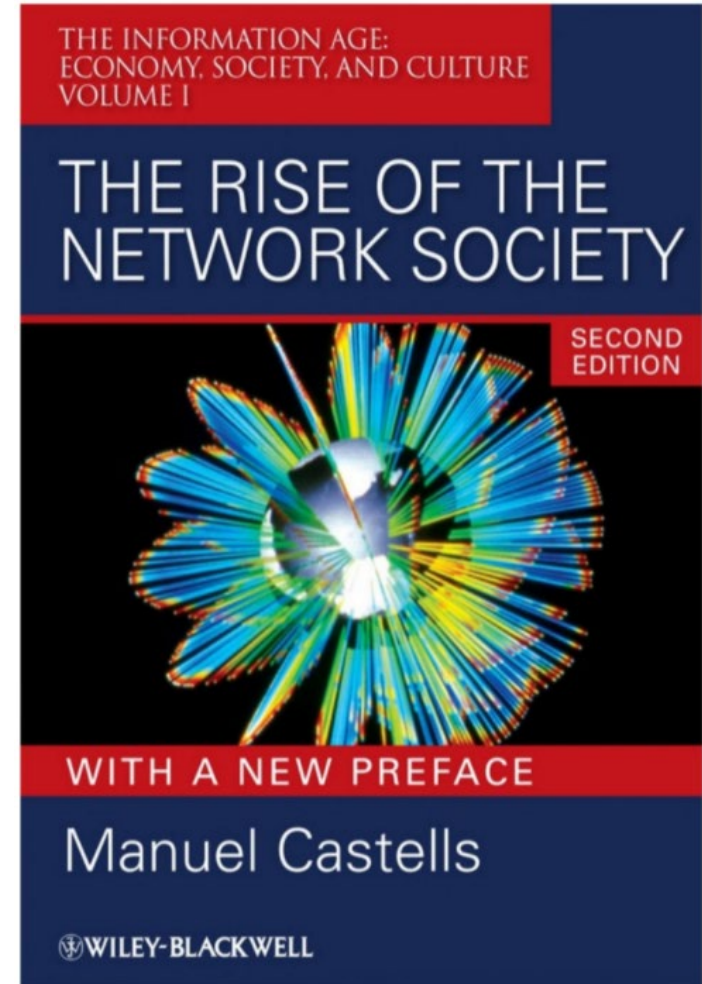~ Hill 2014: *What an Algorithm Is*

Network Society

"A society where the **key social structures** and **activities** are organized around **electronically processed information networks**.

So it's not just about networks or social networks, because **social networks have been very old forms of social organization**."

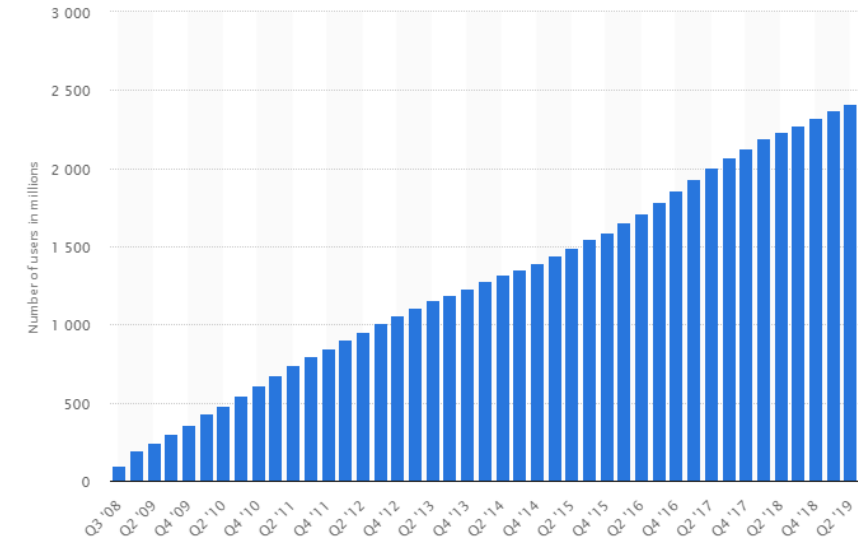~Manuel Castells (in [Berkeley Globe Trotter](#))

"And within a couple weeks, a few thousand people had signed up."
~ Mark Zuckerberg

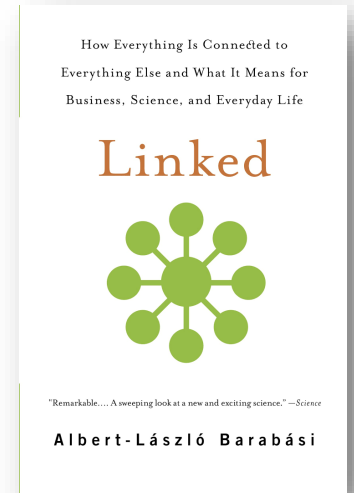Facebook in 2010

Facebook's mission:
"Founded in 2004, Facebook's mission is to give people the power to build community and **bring the world closer together**. People use Facebook to stay **connected with friends and family**, to discover what's going on in the world, and to share and express what matters to them."

Influencers: a network view

- Scale-free networks

- Hub formation:
  - Time (early = better)
  - Preferential attachment
    - "Rich get richer"
    - Pareto Principle: '80% of X have 20% of Y'
    - 80% of people i
  - 'Fitness'

- The Serendipitous Economies of the Platform

- The Platform as Agent

How Everything Is Connected to
Everything Else and What It Means for
Business, Science, and Everyday Life

Linked

"Remarkable... A sweeping look at a new and exciting science." —*Science*

Albert-László Barabási

Pewdiepie (Felix Kjellberg), first individual to gain 100 million followers
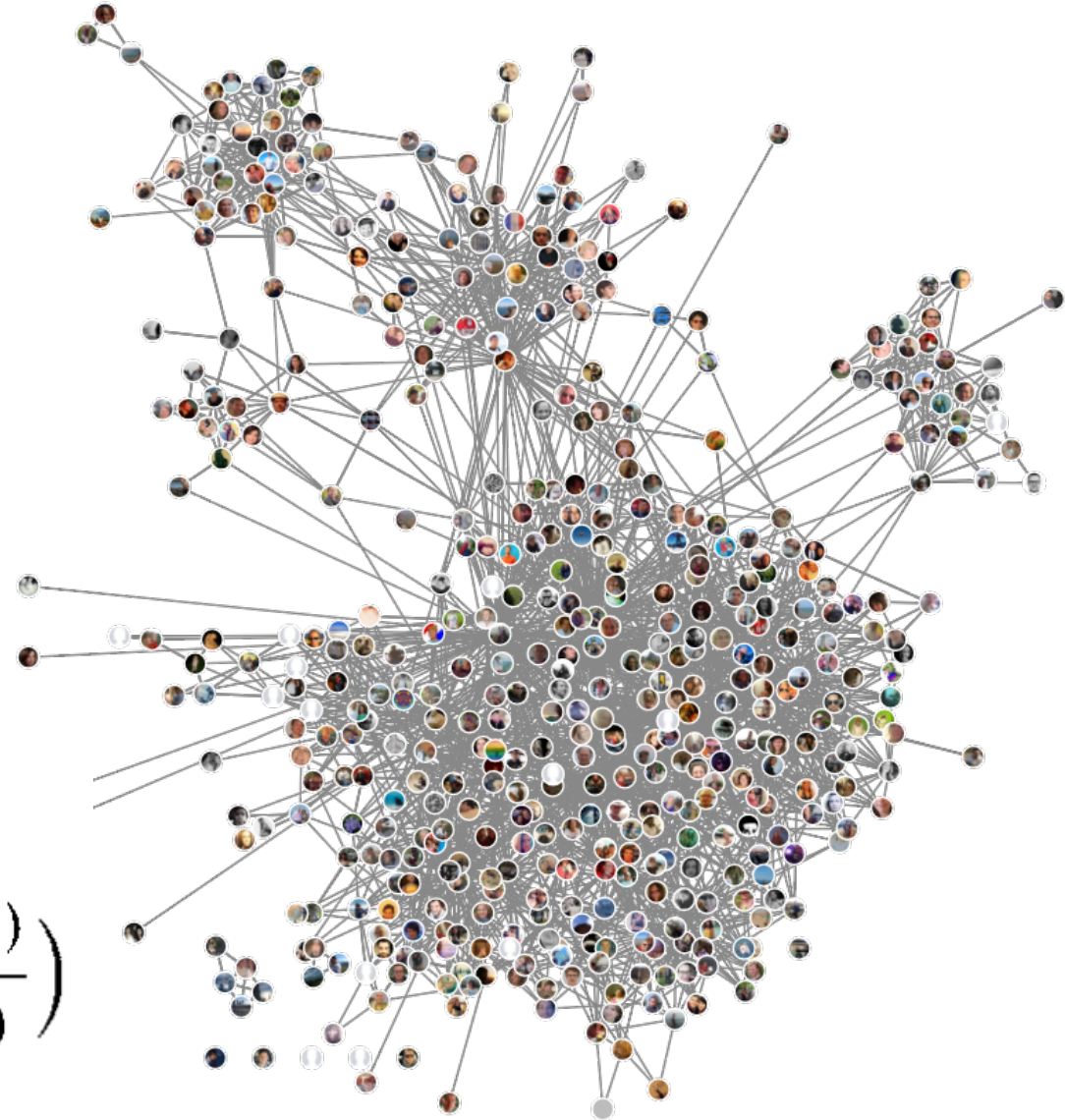
My FB (2016) Ego as Network Algorithms

Node Degree
$$c_v = \sum_{e \in \text{instar(v)} \cup \text{outstar(v)}} \omega(e)$$

Network Density
$$\frac{t}{n(n-1)}$$

PageRank Centrality
$$PR(A) = (1 - d) + d\left(\frac{PR(T1)}{C(T1)} + \ldots + \frac{PR(Tn)}{C(Tn)}\right)$$

The PageRank Algorithm

We assume page A has pages T1...Tn which point to it (i.e., are citations). The parameter d is a damping factor which can be set between 0 and 1. We usually set d to 0.85. There are more details about d in the next section. Also $C(A)$ is defined as the number of links going out of page A. The PageRank of a page A is given as follows:

$$PR(A) = (1 - d)$$

$$+ d\left(\frac{PR(T1)}{C(T1)} + \ldots + \frac{PR(Tn)}{C(Tn)}\right)$$

Note that the PageRanks form a probability distribution over Web pages, so the sum of all Web pages' PageRanks will be one.

What is the PageRank for Node A?

C -> A

B -> C

A -> B
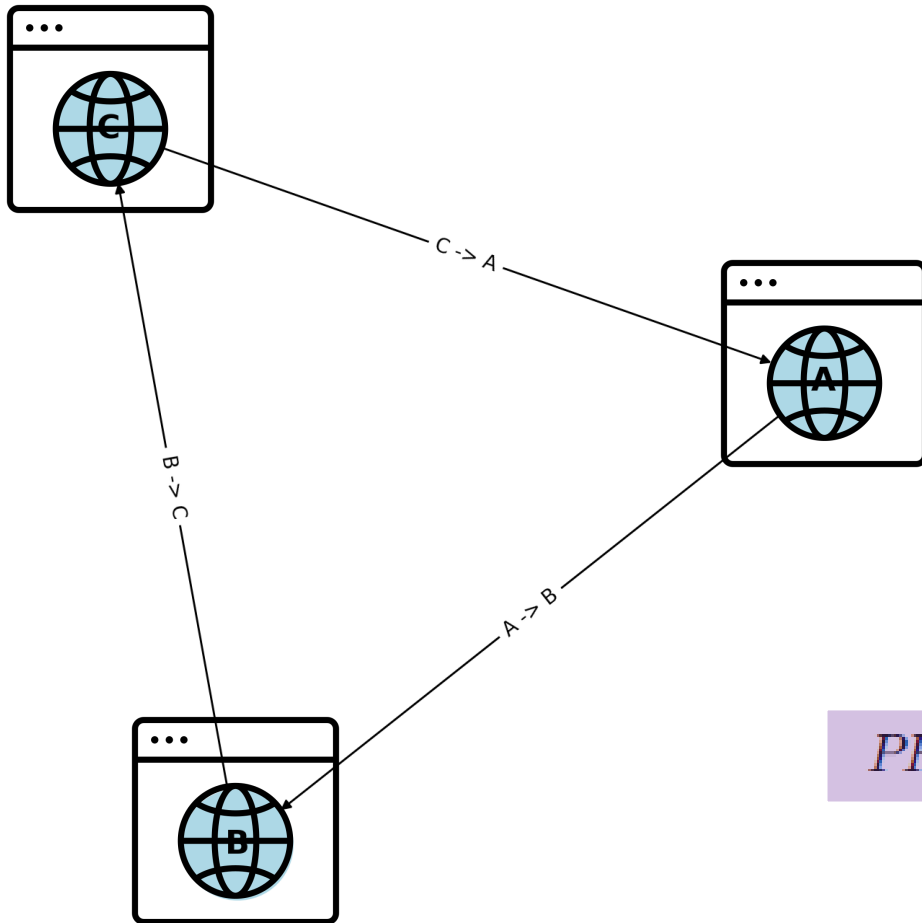
A>C
A>B
B>A
B>C
C>A
C>B

$$PR(A) = (1 - d)$$

$$+ d\left(\frac{PR(T1)}{C(T1)} + \ldots + \frac{PR(Tn)}{C(Tn)}\right)$$

$$PR(A) = PR(B) = PR(C) = \frac{1}{3} = 0.333$$

$$PR(A) = \frac{1 - 0.85}{3} + 0.85\left(\frac{PR(C)}{1}\right)$$

$$PR(A) = \frac{0.15}{3} + 0.85 \times 0.333 = 0.05 + 0.28305 = 0.33305$$
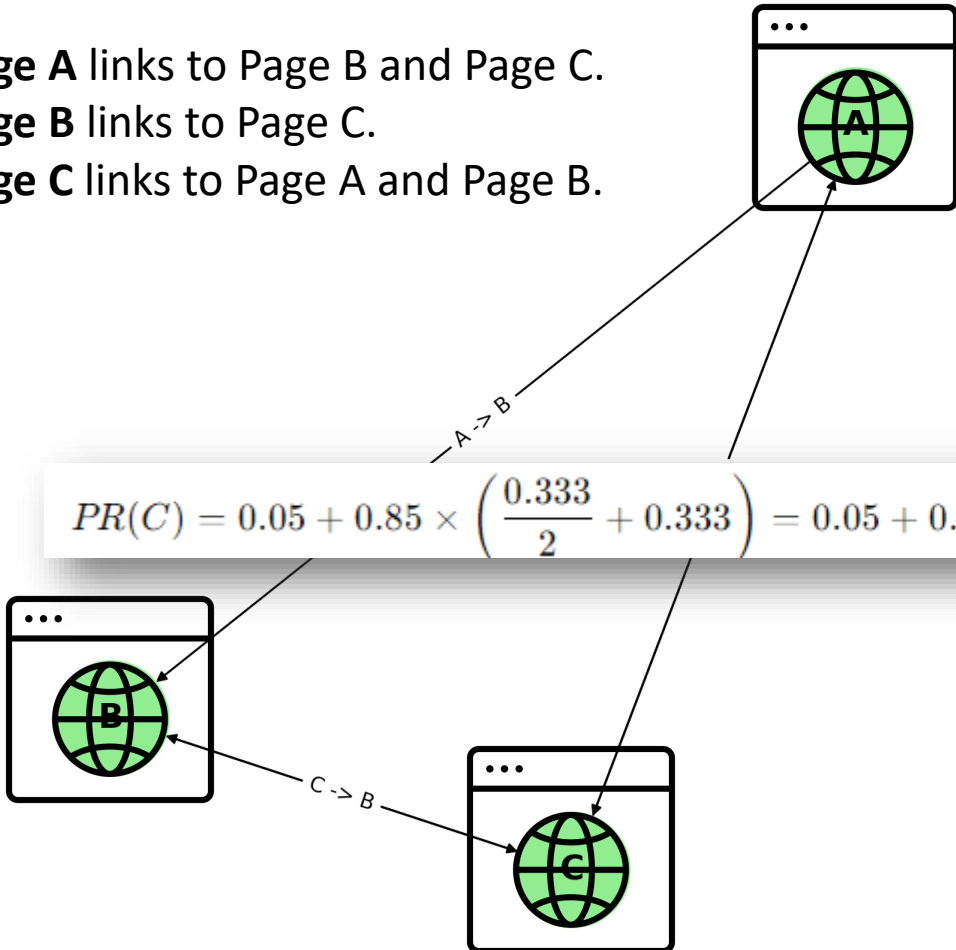
What is the PageRank Value of C?

- **Page A** links to Page B and Page C.
- **Page B** links to Page C.
- **Page C** links to Page A and Page B.

$$PR(A) = (1 - d)$$

$$+ d \left(\frac{PR(T1)}{C(T1)} + \ldots + \frac{PR(Tn)}{C(Tn)} \right)$$

$$PR(C) = \frac{1 - 0.85}{3} + 0.85 \times \left(\frac{PR(A)}{2} + \frac{PR(B)}{1} \right)$$

$$PR(C) = 0.05 + 0.85 \times \left(\frac{0.333}{2} + 0.333 \right) = 0.05 + 0.85 \times (0.1665 + 0.333) = 0.05 + 0.85 \times 0.4995 = 0.05 + 0.424575 = 0.474575$$

A -> B

C -> B

Who is the most PageRank central person in my 2016 Facebook Network?

$$PR(A) = (1 - d)$$

PageRank Centrality

$$+ d\left(\frac{PR(T1)}{C(T1)} + \ldots + \frac{PR(Tn)}{C(Tn)}\right)$$
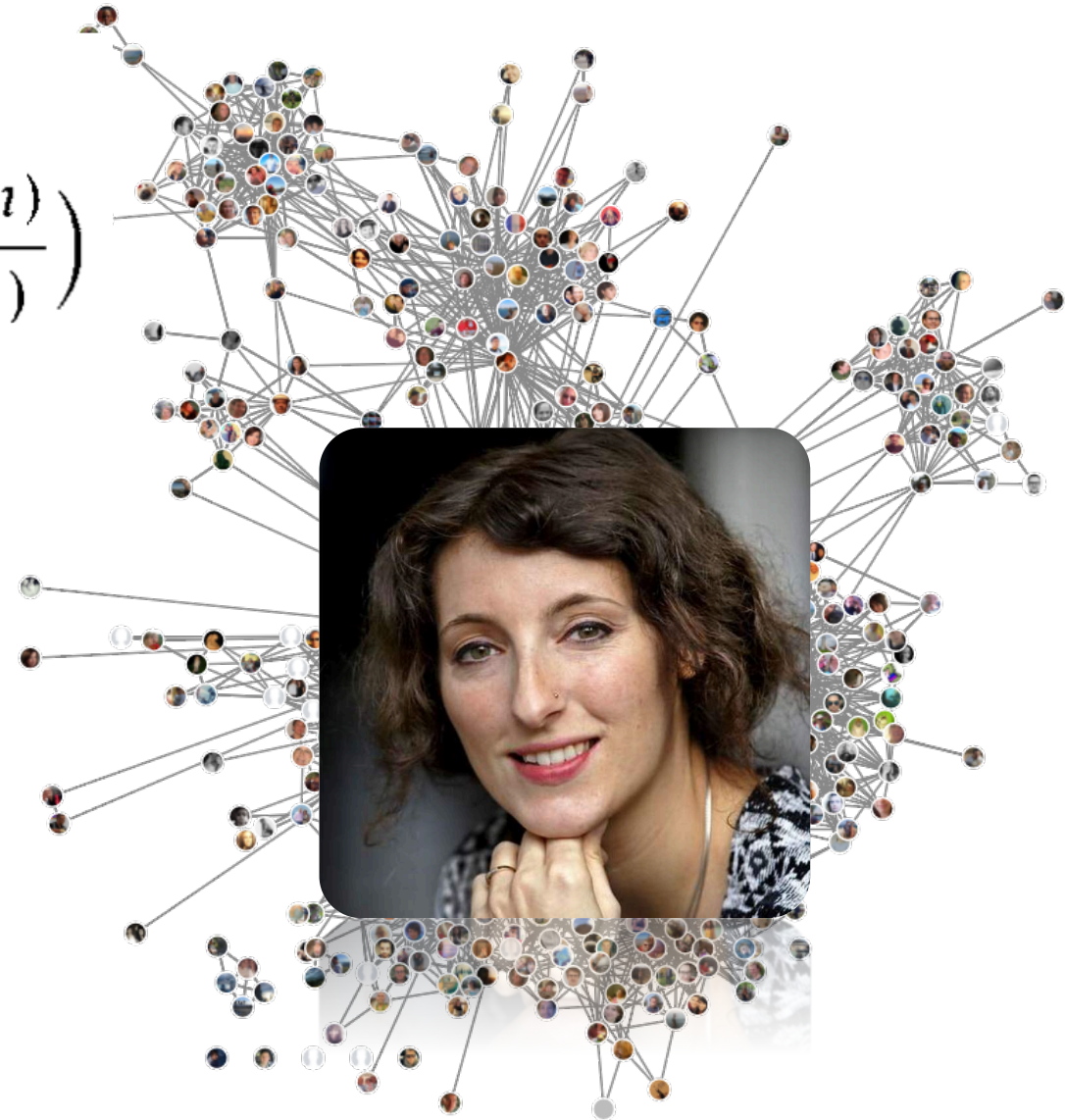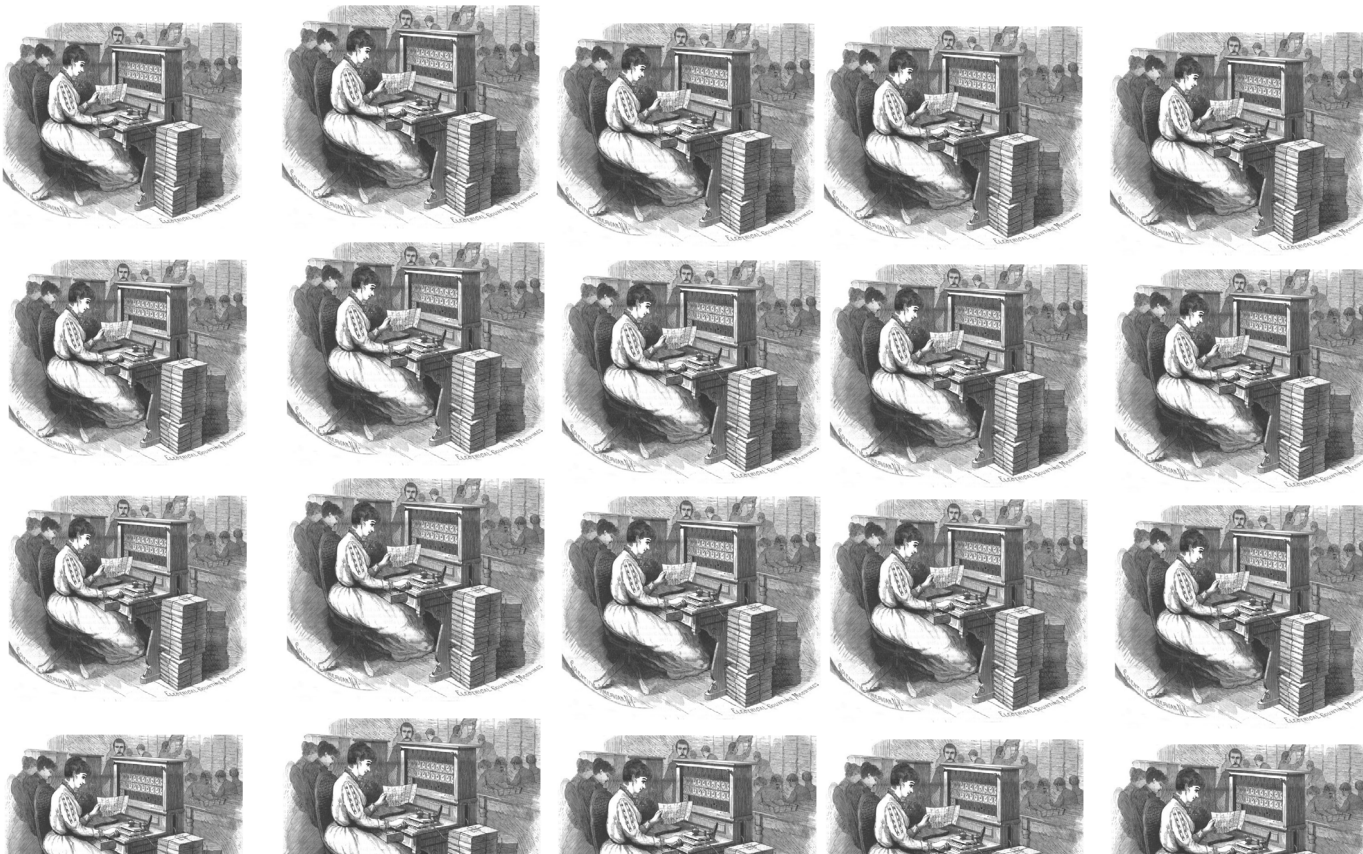
What Do Algorithms Afford?

"An affordance is an action possibility formed by the relationship between an agent and its environment"

Gibson, 1979, *The Ecological Approach to Visual Perception*

Algorithmic Culture (Galloway 2006)

- Games as Algorithmic Artefacts
- Algorithms:
    - Provide Decentralized Machinic Control and Protocol
    - Engender Automation of Culture
    - Change Human/Machinic Agency
    - Have their own Cultural Logic and Politics
- The Algorithm 'democratizes' the structure of Culture (Striphas 2015)
    - The Network Shows It.
- "All the best which has been thought and said" (following Arnold 1869)

THE WALL STREET JOURNAL.

Facebook Knows Instagram Is Toxic for Teen Girls, Company Documents Show

Its own in-depth research shows a significant teen mental-health issue that Facebook plays down in public

Objectives

Instagram is coming under increasing scrutiny with relation to mental health problems. Both popular and academic press point to social media in general, and Instagram specifically, as having a negative effect on teens' mental health. These effects have included body dissatisfaction, self-esteem, negative mood, anxiety, depression, loneliness, self-harm, and suicide. Other research suggests that the effects of social media is more nuanced, influenced by previous dispositions or the experiences teens have on the apps they use.

Existing research, however, does not explore the perceptions that teens have about their own mental health, the role that social media and Instagram play in it, or how Instagram can help teens.

WE CONDUCTED MARKET RESEARCH TO:
- understand how teens talk about mental health
- get a nuanced understanding of teens' perceptions of how Instagram effects their mental health

IN ORDER TO:
- Inform outreach teams how we might build meaningful and impactful campaigns in this space
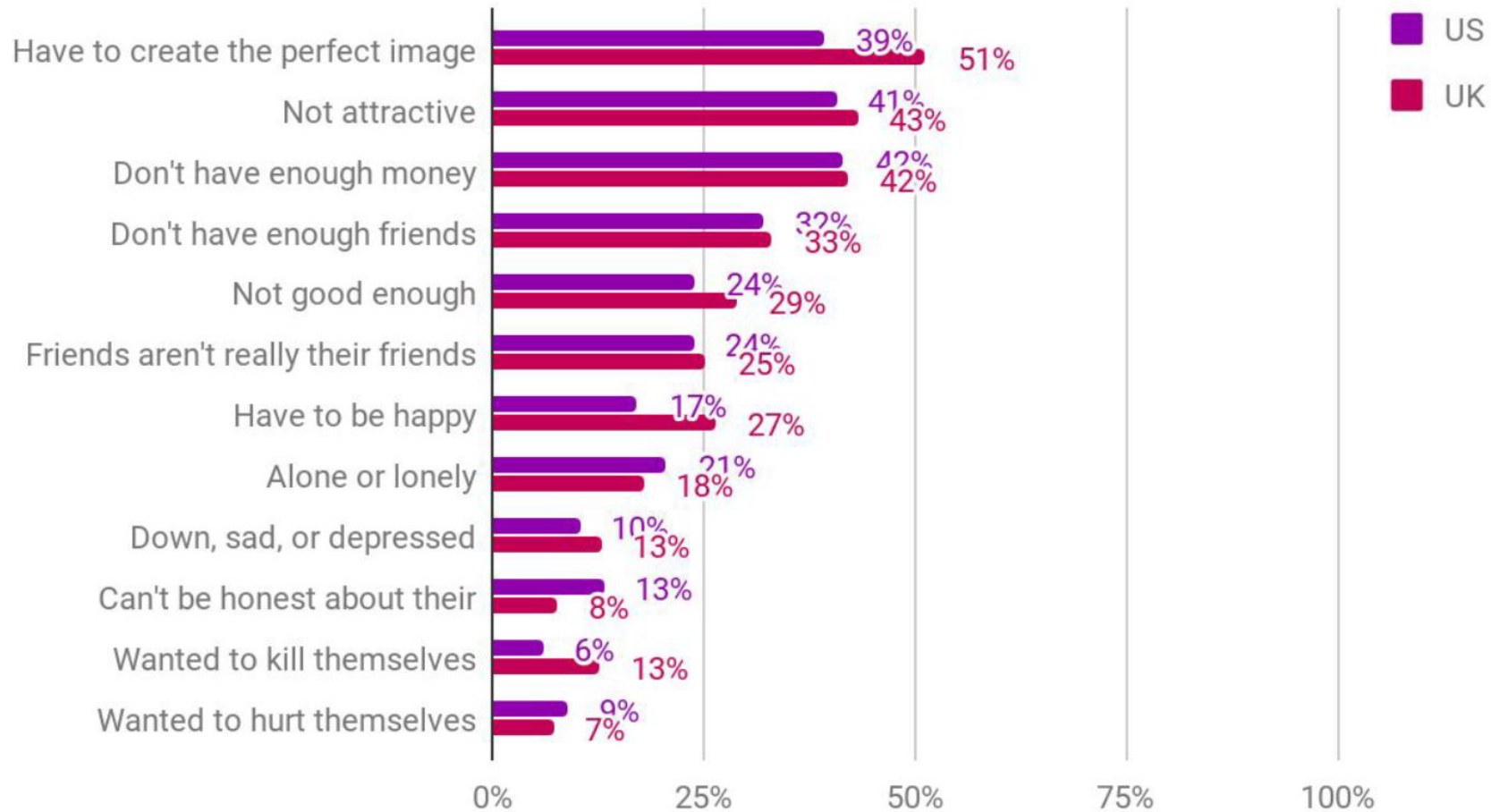- Inform product teams how to best support teens in this space

Methodology

	In-person qualitative	Follow-up video call	Online survey
Sample size	40	8	2,503
Markets	London, UK Los Angeles, USA	UK, US	US 1,221 UK 1,282
Recruitment	Regionally representative third-party panels	Participants from in-person qualitative groups	Instagram users
Tasks	2-hour in-person focus groups (4 per gendered group)	1-hour VC conversation	Online survey
Qualifications	Monthly Instagram user Age 13-17 Fit into one of themes		Monthly Instagram user Teens
Recruited around themes*	Body image, self-esteem Negative mood, depression Lonely, isolated		
Baseline group	Did not code into any theme		

* Themes identified based off review of academic literature on the topic of social media and teen mental health.

The perfect image, feeling attractive, and having enough money are the most likely to have started on Instagram
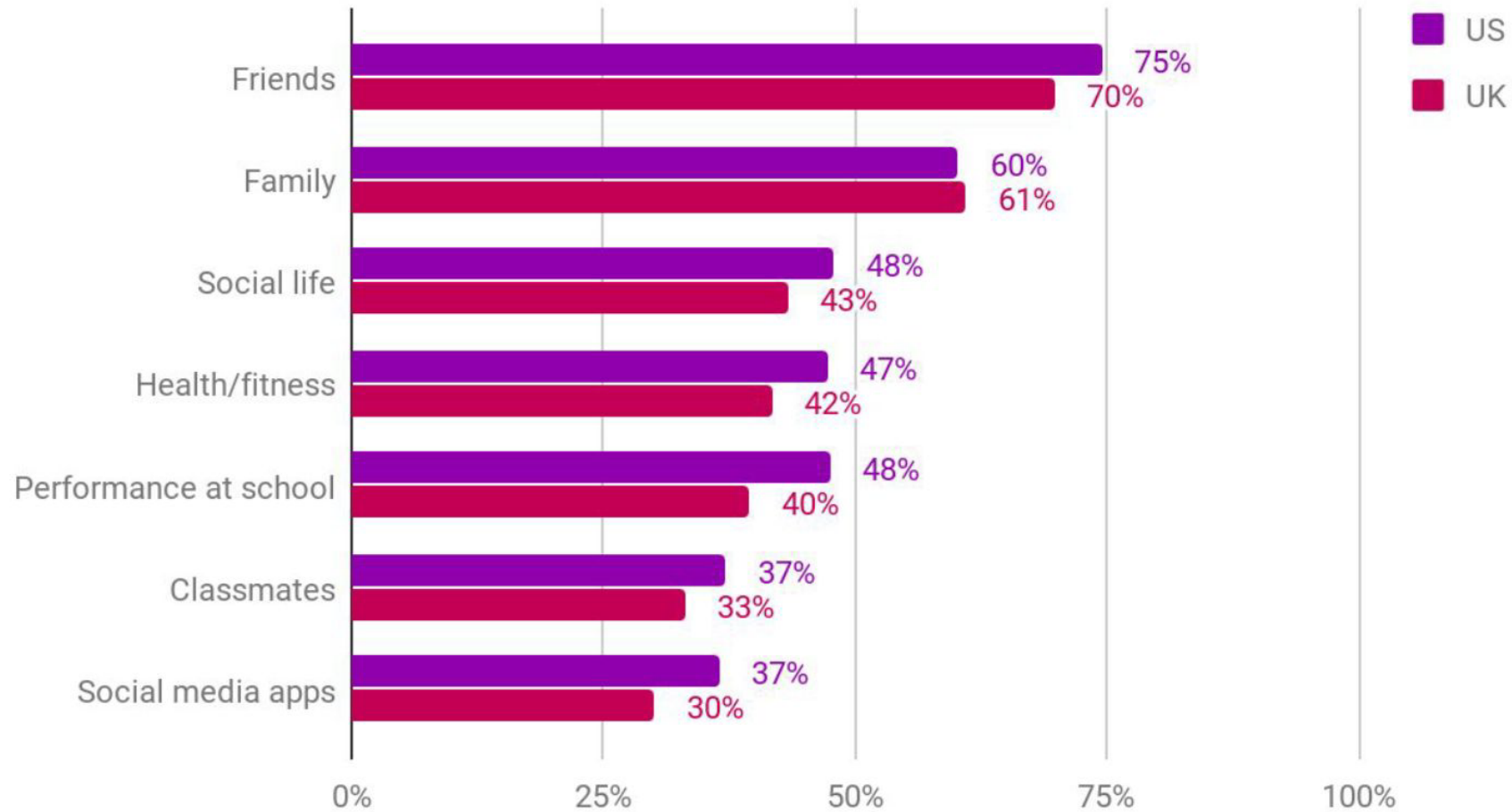
Started on Instagram

	US	UK
Have to create the perfect image	39%	51%
Not attractive	41%	43%
Don't have enough money	42%	42%
Don't have enough friends	32%	33%
Not good enough	24%	29%
Friends aren't really their friends	24%	25%
Have to be happy	17%	27%
Alone or lonely	21%	18%
Down, sad, or depressed	10%	13%
Can't be honest about their	13%	8%
Wanted to kill themselves	6%	13%
Wanted to hurt themselves	9%	7%

Q: Of the things you've felt in the past month, did any of them start on Instagram? Please select all that apply
US n =565; UK n = 557

Friends and family have the most positive impact on mental health

Very or somewhat positive effect on mental health

Legend:
- US (purple)
- UK (red)

Category	US	UK
Friends	75%	70%
Family	60%	61%
Social life	48%	43%
Health/fitness	47%	42%
Performance at school	48%	40%
Classmates	37%	33%
Social media apps	37%	30%

Q: In general, how does each of the following affect [the way you feel about yourself/your mental health]?
There were no statistically significant differences among those who answered for "the way you feel about yourself" and those who answered for "your mental health"
US n = 1296; UK n = 1308

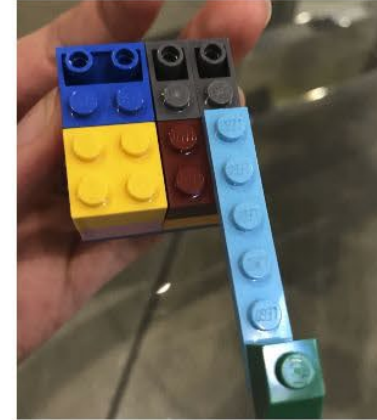# Mental unwellness was depicted in six themes

"I had a wall around everything because I want people to go away, to go to my room, to lock myself out from people and keep everyone out"
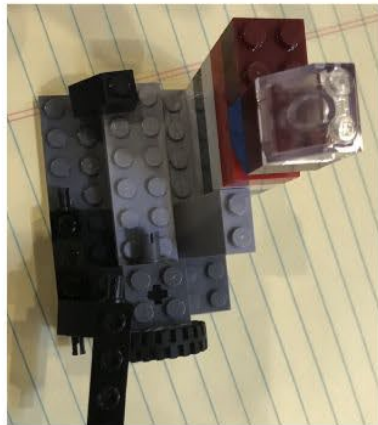*- US, Male*

Walls

"I had wheels because I'm all over the place.My mind is always spinning"
- US Female

Circling, frenetic

"I put people far away to represent that feeling lonely. I feel like I need people but I pull away"
- US Male

Loneliness, isolation

"I put dark colors because its the dark place that you don't want to fall into"
- US Male

Dark, full of terrors

"I put myself underneath all of these blocks, because it feels heavy. Like you have a weight on your shoulders"
- UK, Male

Heavy baggage

"I put red devil horns online because I'm easily angered and tipped over the edge"
- UK, Male

Potentially explosive

"All this harkens back to the oldest sense of *information* – where some mysterious entity is responsible for imbuing people and objects with shape, quality or character."
~Striphas, 2015

"

Neither Black nor Box (Bucher 2016)

Step One:

Do Not Fear the Black Box

Step Two:

Do Not Expect the Solution to Be Inside the Black Box

Step Three:

Consider Boxing the Box

Takeaway: Algorithms are the yardstick of digital culture
Meta Takeaway: Studying them is incredibly hard, but necessary

What do you afford to the Algorithm?
How are algorithms present in our culture?

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Leiden University resources available here: tinyurl.com/wellbeing-LU

Suicide Prevention Helpline The Netherlands (anonymous): Call 113