Cyberspace Governance:  
Case studies – Experimentation (4c)

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When the Entire Internet Seems to Break At Once

The easiest way to take down the web is to attack people’s access to it.
Internet Attack Spreads, Disrupting Major Websites

By NICOLE PERLROTH  OCT. 21, 2016

A map of the areas experiencing problems, as of Friday afternoon, according to downdetector.com.
WASHINGTON — When surveillance cameras began popping up in the 1970s and ’80s, they were welcomed as a crime-fighting tool, then as a way to monitor traffic congestion, factory floors and even baby cribs. Later, they

But now those cameras — and many other devices that today are connected to the internet — have been commandeered for an entirely different purpose: as a weapon of mass disruption. The internet slowdown that swept the East Coast on Friday, when many Americans were already jittery about
About the last Friday attack (10/21)

• major websites experienced outages and other technical problems: the New York Times, Twitter, Pinterest, Reddit, GitHub, Etsy, Tumblr, Spotify, PayPal, Verizon, Comcast, etc.

• the attack target the DNS infrastructure (i.e., DYN) and took the form of a distributed denial-of-service attack (DDoS).

• B. Schneier:
  – “These attacks are significantly larger than the ones they're used to seeing. They last longer. They're more sophisticated. And they look like probing.”
  – argued that the U.S. government must regulate the internet of things or face DDoS-ing botnets of dangerous size.

• Krebs: “It's hard to imagine a stronger form of censorship than these DDoS attacks because if nobody wants to [host your website,] then that's pretty effective censorship.
About the last Friday attack (10/21)

• Take away (NYTimes article):

  – The difference with the internet is that it is not clear in the United States who is supposed to be protecting it. The network does not belong to the government — or really to anyone. Instead, every organization is responsible for defending its own little piece.

  – The Department of Homeland Security is supposed to provide the baseline of internet defense for the United States, but it is constantly playing catch-up.

  – The F.B.I. investigates breaches, but that takes time — and, in the meantime, people want to bank online and stream television shows.

  – The head of the National Security Agency, Adm. Michael Rogers, said recently that experts were looking at the problem the wrong way. “We are overfocused on places and things,” he said in a talk at Harvard. “We need to focus on the data,” and how it flows — or doesn’t flow.

  – That is where the internet of things comes in.
Readings


- Review of the projects – references, short term goals, etc.
Is this user feeling happy or sad? And is it Facebook’s fault? (Dado Ruvic/Reuters)
Experimental evidence of massive-scale emotional contagion through social networks

Adam D. I. Kramer, Jamie E. Guillory, and Jeffrey T. Hancock

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Edited by Susan T. Fiske, Princeton University, Princeton, NJ, and approved March 25, 2014 (received for review October 23, 2013)

A correction has been published

Significance

We show, via a massive (N = 689,003) experiment on Facebook, that emotional states can be transferred to others via emotional contagion, leading people to experience the same emotions without their awareness. We provide experimental evidence that emotional contagion occurs without direct interaction between people (exposure to a friend expressing an emotion is sufficient), and in the complete absence of nonverbal cues.
Hypothesis

Significance

We show, via a massive ($N = 689,003$) experiment on Facebook, that emotional states can be transferred to others via emotional contagion, leading people to experience the same emotions without their awareness. We provide experimental evidence that emotional contagion occurs without direct interaction between people (exposure to a friend expressing an emotion is sufficient), and in the complete absence of nonverbal cues.
The Scientific Method

Research question?

1. Existing Knowledge
2. Hypothesis
3. Prediction
4. Tests & Observation
5. Old or New Theory confirmed
6. Theory Selection

Hypothesis must be adjusted

emotional contagion occurs via text-based computer-mediated communication

Question: does contagion processes occur for emotions in massive social networks
Emotional states can be transferred to others via emotional contagion, leading them to experience the same emotions as those around them.

Prior studies have also failed to address whether nonverbal cues are necessary for contagion to occur, or if verbal cues alone suffice.

Others have suggested that in online social networks, exposure to the happiness of others may actually be depressing to us, producing an “alone together” social comparison effect.

**Question:** does contagion processes occur for emotions in massive social networks
On Facebook, people frequently express emotions, which are later seen by their friends via Facebook’s “News Feed” product.

Facebook’s algorithm objective is to select the most relevant and engaging stories to show in the NewsFeed.

Which content is shown or omitted in the News Feed is determined via a ranking algorithm that Facebook continually develops and tests in the interest of showing viewers the content they will find most relevant and engaging.
In January 2012, 689,003 randomly selected users had their Facebook newsfeeds altered.

The experiment tested whether exposure to emotions led people to change their own posting behaviors, in particular whether exposure to emotional content led people to post content that was consistent with the exposure—thereby testing whether exposure to verbal affective expressions leads to similar verbal expressions, a form of emotional contagion.
The tests included only people who viewed Facebook in English

Two parallel experiments were conducted for positive and negative emotion:
- One in which exposure to friends’ positive emotional content in their News Feed was reduced;
- One in which exposure to negative emotional content in their News Feed was reduced.

When a person loaded their NewsFeed, posts that contained emotional content of the relevant emotional valence, each emotional post had between a 10% and 90% chance of being omitted from their News Feed for that specific viewing.
The experiment (iii)

- The LIWC 2007 monitored positive and negative words in the users Facebook posts.
- “Posts were determined to be positive or negative if they contained at least one positive or negative word”
- Each positive word received a +1 score on the positive scale and each negative word received a +1 score on the negative scale.
Results(i)

• For each experiment, two dependent variables were examined pertaining to emotionality expressed in people’s own status updates: the percentage of all words produced by a given person that was either positive or negative during the experimental period.

• In total over three million Facebook posts were analysed by researchers.

• The study found that “more negative newsfeeds led to more negative status messages [and] more positive newsfeeds led to more positive statuses”

• It also found that when researchers reduced the amount of positive or negative information in the selected users’ newsfeeds those people reduced the amount of words that they posted on Facebook.
Mean number of positive (Upper) and negative (Lower) emotion words (percent) generated people, by condition.

Adam D. I. Kramer et al. PNAS 2014;111:8788-8790
Public debate - Facebook position

• Facebook defended their experiment by claiming that users gave consent by agreeing to the site’s **data use policy** when they first signed up to use the site.

• This data use policy states that Facebook “may use the information that we receive about you...for internal operations, including troubleshooting, data analysis, testing, research and service improvement”.

• However, opposition to the experiment claim that the data use policy allows observation of **existing user behaviour** and does not allow the manipulation of data that Facebook users see
Conclusions

• These results suggest that the emotions expressed by friends, via online social networks, influence our own moods, constituting the first experimental evidence for massive-scale emotional contagion via social networks, and providing support for previously contested claims that emotions spread via contagion through a network.

• Obs: Facebook does not simply passively collect data about us. It also has the power to affect our behavior.
Public Outcry

Facebook denies emotion contagion study had government and military ties
4 Jul 2014  106

Facebook faces criticism amid claims it breached ethical guidelines with study
30 Jun 2014  57

Privacy watchdog files complaint over Facebook emotion experiment
4 Jul 2014

Facebook T&Cs introduced 'research' policy months after emotion study
1 Jul 2014  38

Journal that published Facebook mood study expresses 'concern' at its ethics
3 Jul 2014  43

Facebook's emotion study: yet another reason for distrust
30 Jun 2014  14

Facebook apologises for psychological experiments on users
2 Jul 2014  442

Facebook emotion study breached ethical guidelines, researchers say
30 Jun 2014  371
Do You Consent?

If tech companies are going to experiment on us, they need better ethical oversight.

By James Grimmelmann

A man takes part in numerous experiments—er, uses social media.

Facebook would like to know whether it’s bad for you. Some social science
Facebook Tinkers With Users’ Emotions in News Feed Experiment, Stirring Outcry

By VINDU GOEL JUNE 29, 2014

To Facebook, we are all lab rats.

Facebook routinely adjusts its users’ news feeds — testing out the number of ads they see or the size of photos that appear — often without their knowledge. It is all for the purpose, the company says, of creating a more alluring and useful product.

But last week, Facebook revealed that it had manipulated the news feeds of over...
Informed Consent

• There is a discussion about informed consent of the people who were involved in the experiment
• Users tested in the experiment did not obtain any prior information or opt-out opportunity

Editorial Expression of Concern and Correction
Readings for Next Class


• [36] Latanya Sweeney, "Discrimination in Online Ad Delivery", Communications of the ACM, Vol. 56 No. 5, Pages 44-54

THANKS!

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