

Lecture 20: Social media and social ads

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Sociology 204: Social Networks
Princeton University

1/2 Social targeting of ads





<https://www.youtube.com/watch?v=n2H8wx1aBiQ>

Social media companies want to “help connect everyone around the world and to bring the world closer together”

Social media companies want to “help connect everyone around the world and to bring the world closer together” and sell ads

Social media companies want to “help connect everyone around the world and to bring the world closer together” and sell ads that make lots and lots of money

Facebook posts a 33 percent increase in revenue and a 53 percent jump in profit.



By **Mike Isaac**

Jan. 27, 2021

Facebook on Wednesday reported surging profits and revenue driven by soaring ad sales, but cautioned that it might face “headwinds” in the future from regulation and technology changes.

The social network’s revenue in the fourth quarter grew to \$28 billion, up 33 percent from a year earlier and beating Wall Street estimates. Profits totaled \$11.2 billion, up 53 percent.

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THE AGE OF SURVEILLANCE CAPITALISM

THE FIGHT FOR A
HUMAN FUTURE
AT THE NEW
FRONTIER OF POWER

SHOSHANA
ZUBOFF

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Commodification of personal data for profit:

https://en.wikipedia.org/wiki/Surveillance_capitalism

How Companies Learn Your Secrets



570



Antonio Bolfo/Reportage for The New York Times

By **Charles Duhigg**

Feb. 16, 2012

Pregnancy story illustrates surveillance capitalism, but Duhigg doesn't talk about social networks at all.

"We regard social advertising as any advertising methods that uses information about consumers' social networks to target ads and/or provide personalized social signals."
Bakshy et al.

- ▶ Goel and Goldstein don't care about causality so they use observational data
- ▶ Bakshy et al. care about causality a lot so they run online field experiments
- ▶ Both paper use the data from millions of people

Predicting Individual Behavior with Social Networks

Sharad Goel, Daniel G. Goldstein

Microsoft Research, New York, New York 10011 {sharadg@microsoft.com, dgg@microsoft.com}

- ▶ Focus on managerially relevant question of assessing the worth of social network data for targeting and prediction

Predicting Individual Behavior with Social Networks

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- ▶ Focus on managerially relevant question of assessing the worth of social network data for targeting and prediction
 - ▶ Does social network data help even in the presence of other data that companies already have (e.g., demographics and previous behavior)?
 - ▶ How many targets can network data help find?

Predicting Individual Behavior with Social Networks

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- ▶ Focus on managerially relevant question of assessing the worth of social network data for targeting and prediction
 - ▶ Does social network data help even in the presence of other data that companies already have (e.g., demographics and previous behavior)?
 - ▶ How many targets can network data help find?
- ▶ Given their focus, they don't care about causality

- ▶ Social data comes from Yahoo! communications network.
- ▶ Edge between people who mutually exchanged email or instant messages during a fixed two-month period.
- ▶ 132 million people and 719 million edges, with a mean of 11 contacts per individual.

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Is this the best pump fake in NCAA tournament history?

Houston and Baylor tipped off the Final Four on Saturday and delivered a baffling highlight right after the game began.

[Watch the play unfold »](#)

Trending Now

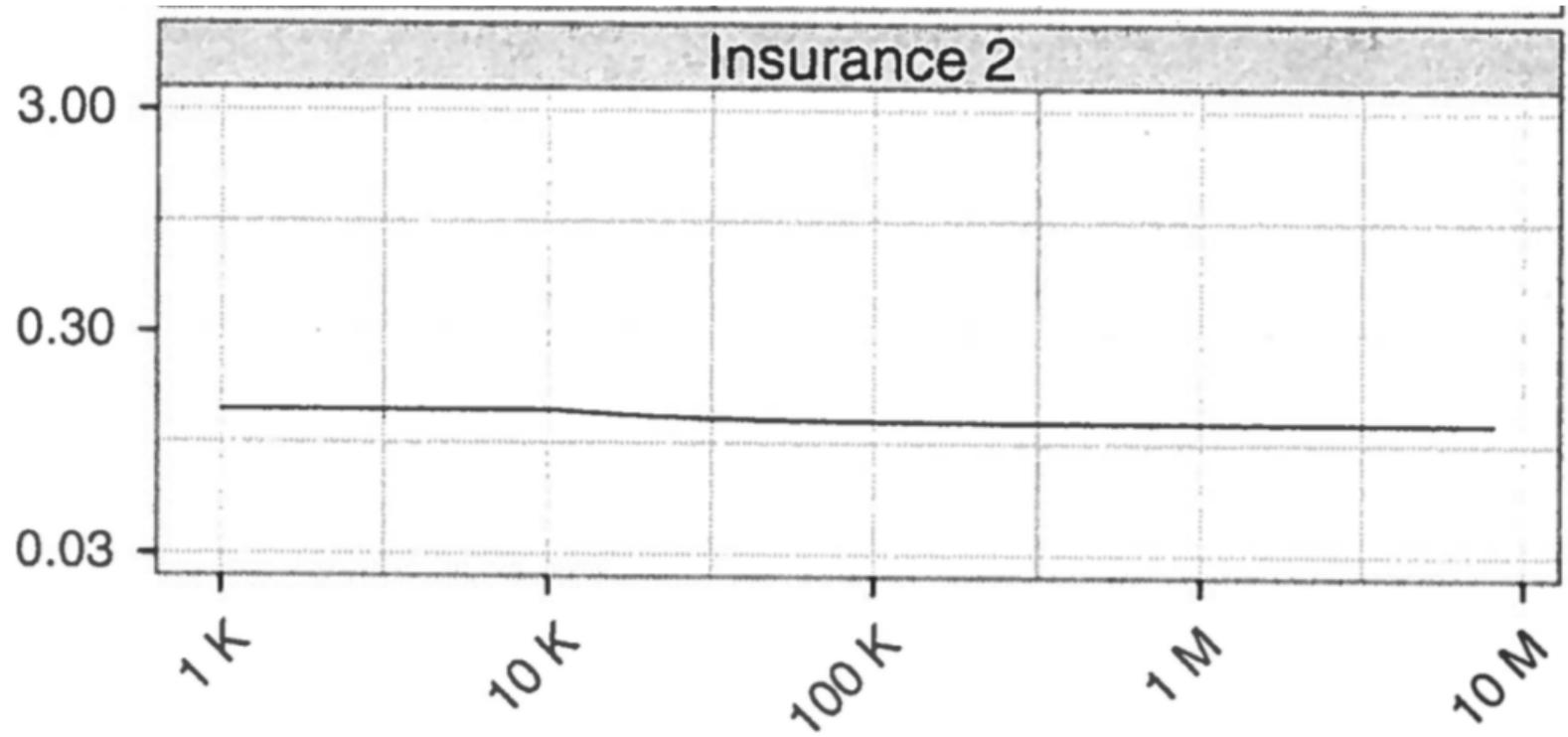
- 1. Mossimo Giannulli
- 2. Dmx Overdose
- 3. David Schwimmer
- 4. Milwaukee Bucks
- 5. Simple Gantt Chart
- 6. Noah Green
- 7. Volkswagen Passat Off...
- 8. Window Shades Online
- 9. Chelsea FC
- 10. Matt Gaetz

Domain	Click rates for individuals without contacts who clicked (%)	Click rates for individuals with contacts who clicked (%)	
Movie 1	0.038	0.47	
Government	0.209	0.46	
Movie 2	0.225	0.44	
TV	0.260	0.50	
Transportation	0.155	0.25	
Insurance 1	0.124	0.19	
Apparel	1.723	2.43	
Household	0.205	0.27	
Insurance 2	0.118	0.13	
Movie 3	1.185	1.30	

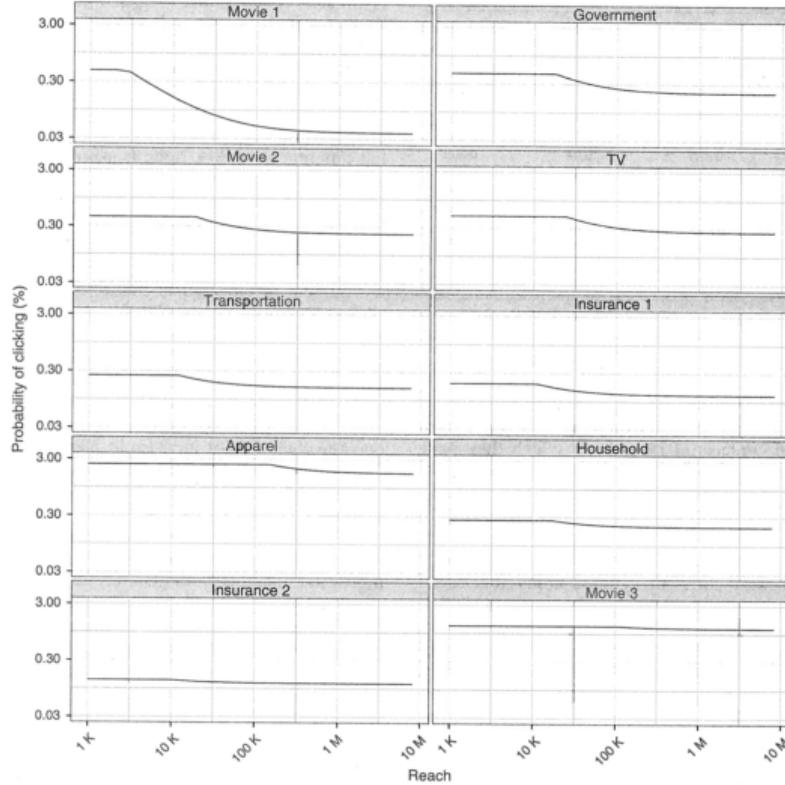
- ▶ People with contacts who clicked on the ad are much more likely to click on the ad (probably not causal). Seems like a good chance to make some money.

Domain	Click rates for individuals without contacts who clicked (%)	Click rates for individuals with contacts who clicked (%)	Percentage of individuals with contacts who clicked
Movie 1	0.038	0.47	0.036
Government	0.209	0.46	0.225
Movie 2	0.225	0.44	0.239
TV	0.260	0.50	0.303
Transportation	0.155	0.25	0.160
Insurance 1	0.124	0.19	0.138
Apparel	1.723	2.43	1.881
Household	0.205	0.27	0.222
Insurance 2	0.118	0.13	0.129
Movie 3	1.185	1.30	1.335

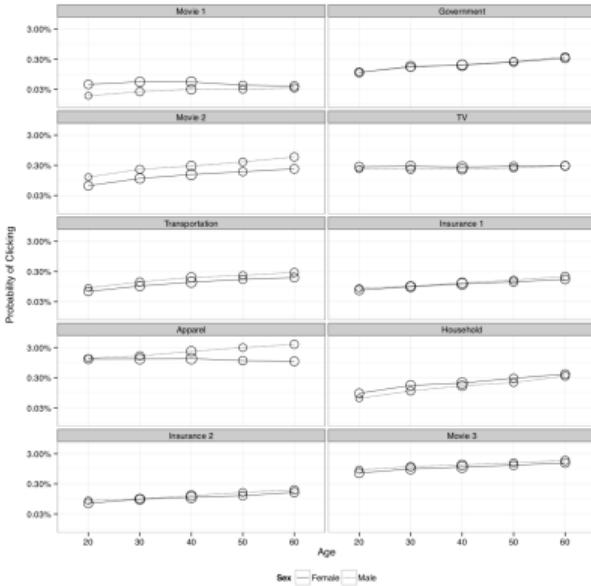
- ▶ People with contacts who clicked on the ad are much more likely to click on the ad (probably not causal). Seems like a good chance to make some money.
- ▶ But. . . . very few people have contacts who clicked on the ads.



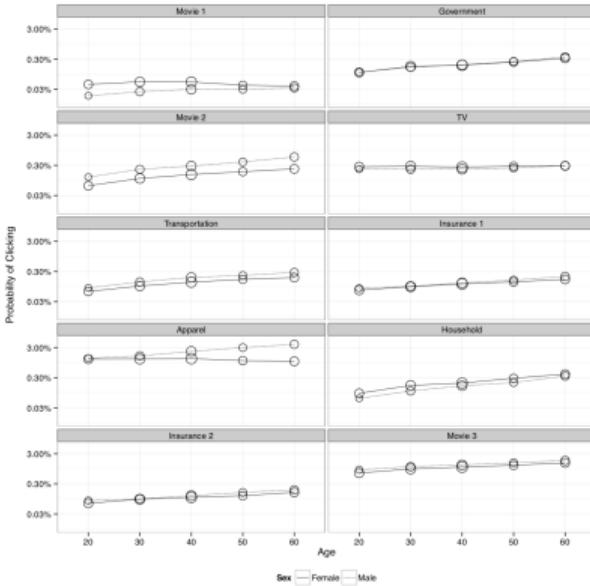
Top-k analysis: order people by the predicted probability of clicking, calculate predicted probability for different sized buckets of people



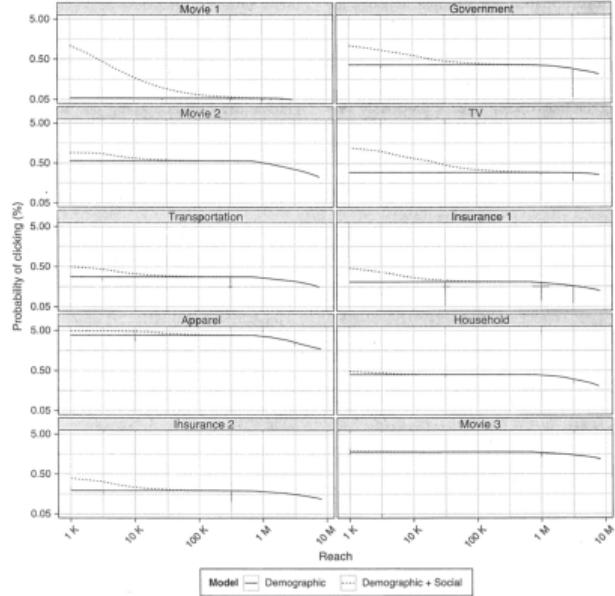
- ▶ social signal allows you to construct pools of between 10,000 and 100,000 candidates who are more likely to click



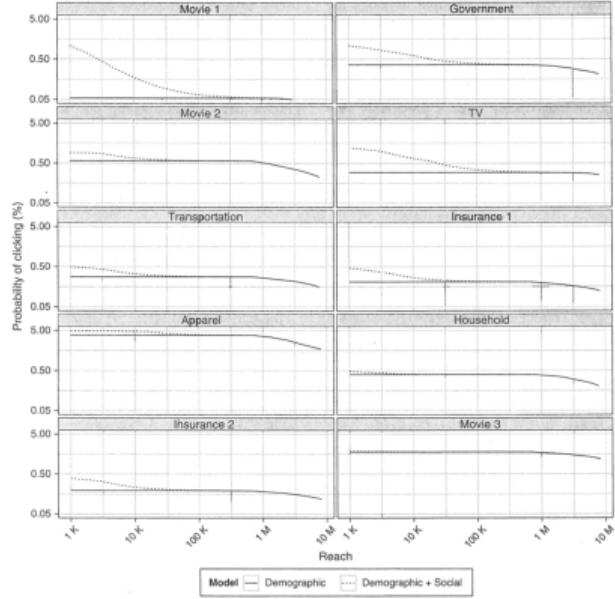
- ▶ But there are important demographic differences as well.



- ▶ But there are important demographic differences as well.
- ▶ Does social add value even if you already have demographic data?

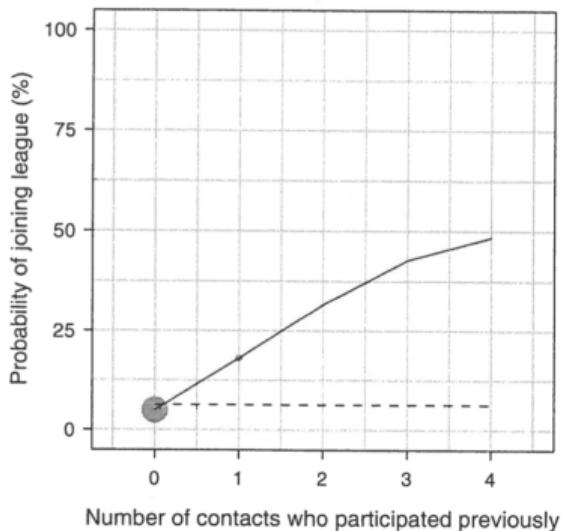


- ▶ Demographic data alone can find large numbers of people who are more likely than average to click



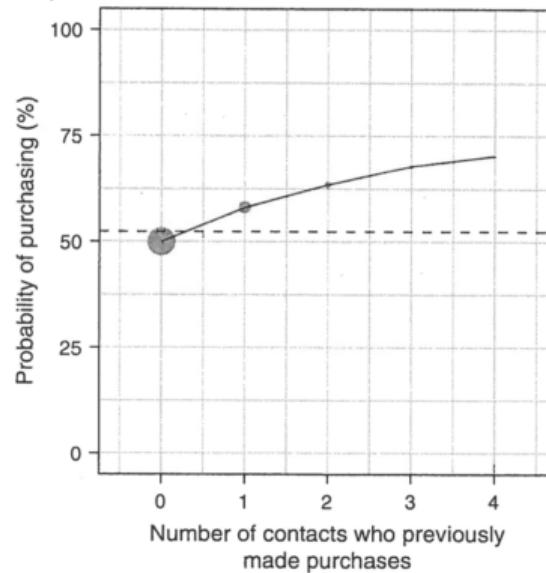
- ▶ Demographic data alone can find large numbers of people who are more likely than average to click
- ▶ Even given that, social data since finds smaller groups more likely to click. But this group is small enough that it might not matter much.

(a) Probability of joining the fantasy football league in 2009 related to the number of social contacts one has who joined in the previous year



(a) Fantasy football

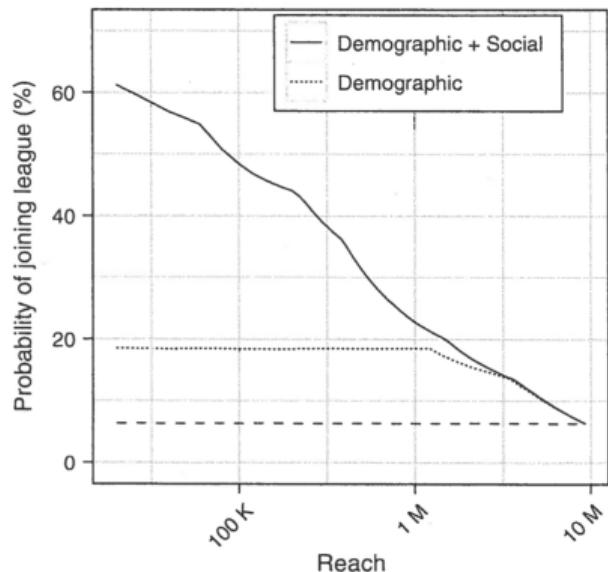
(a) Probability of purchasing at the department store in the second period related to the number of social contacts one has who shopped at the store in the first period



(b) Retail purchase

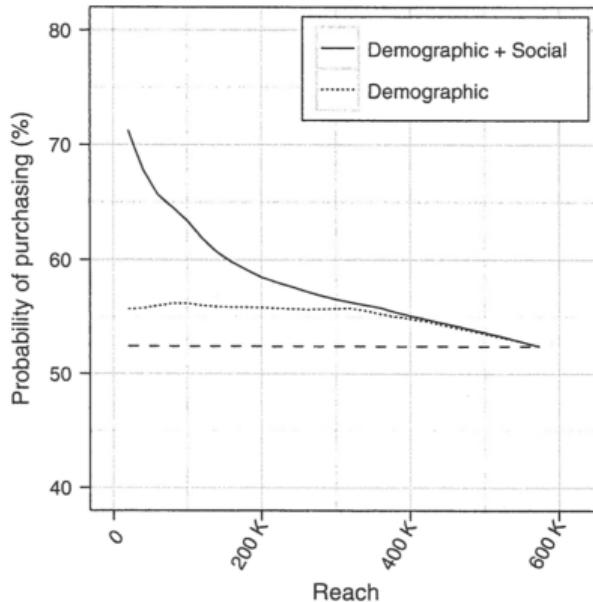
- ▶ Probability of doing activity goes up with number of friends doing it but most people don't have friends going it

Figure 4 Probability of Joining the Fantasy Football League for Varying Numbers of High-Scoring Individuals Under a Demographic Model and a Model That Includes Both Demographic and Social Attributes



(a) Fantasy football

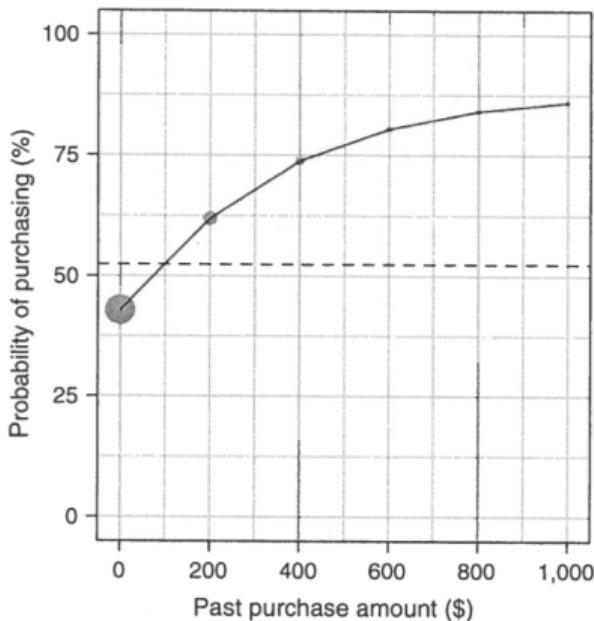
Figure 7 Purchase Rates for Varying Numbers of High-Scoring Individuals Under a Demographic Model and a Model That Includes Both Demographic and Social Attributes for the Shopping Domain



(b) Retail purchase

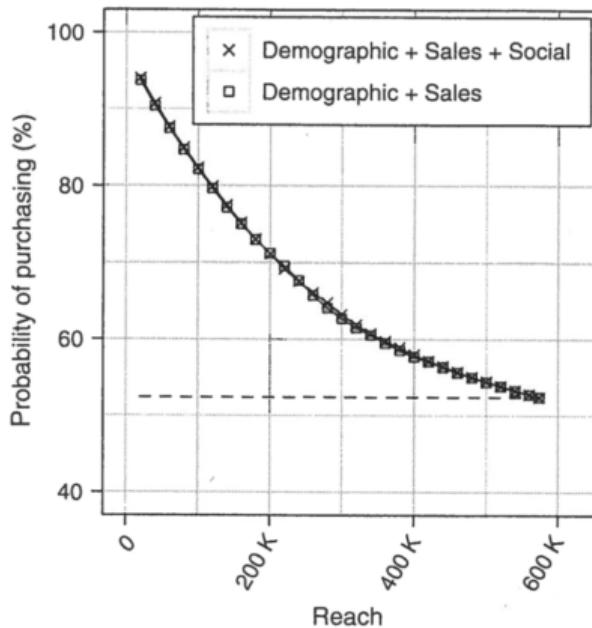
- ▶ Demographics beats baseline
- ▶ Social + demographics beats demographics alone

(a) Probability of purchase in the second period as a function of the amount spent at the store in the first period



- ▶ People who spent more money in the past are more likely to purchase in next time period

(b) Purchase rates for varying numbers of high-scoring individuals under a model that incorporates demographics and past sales vs. a model that adds the additional feature of the number of contacts who previously made purchases



- ▶ Additional value of social is zero once model already has demographics and sales data

What about other ways that social data could be used?