

# Who Benefits from the Data Economy?

Alessandro Acquisti  
Carnegie Mellon University

*Tor Vergata, Laurea in Global Governance, September 17<sup>th</sup>, 2020*

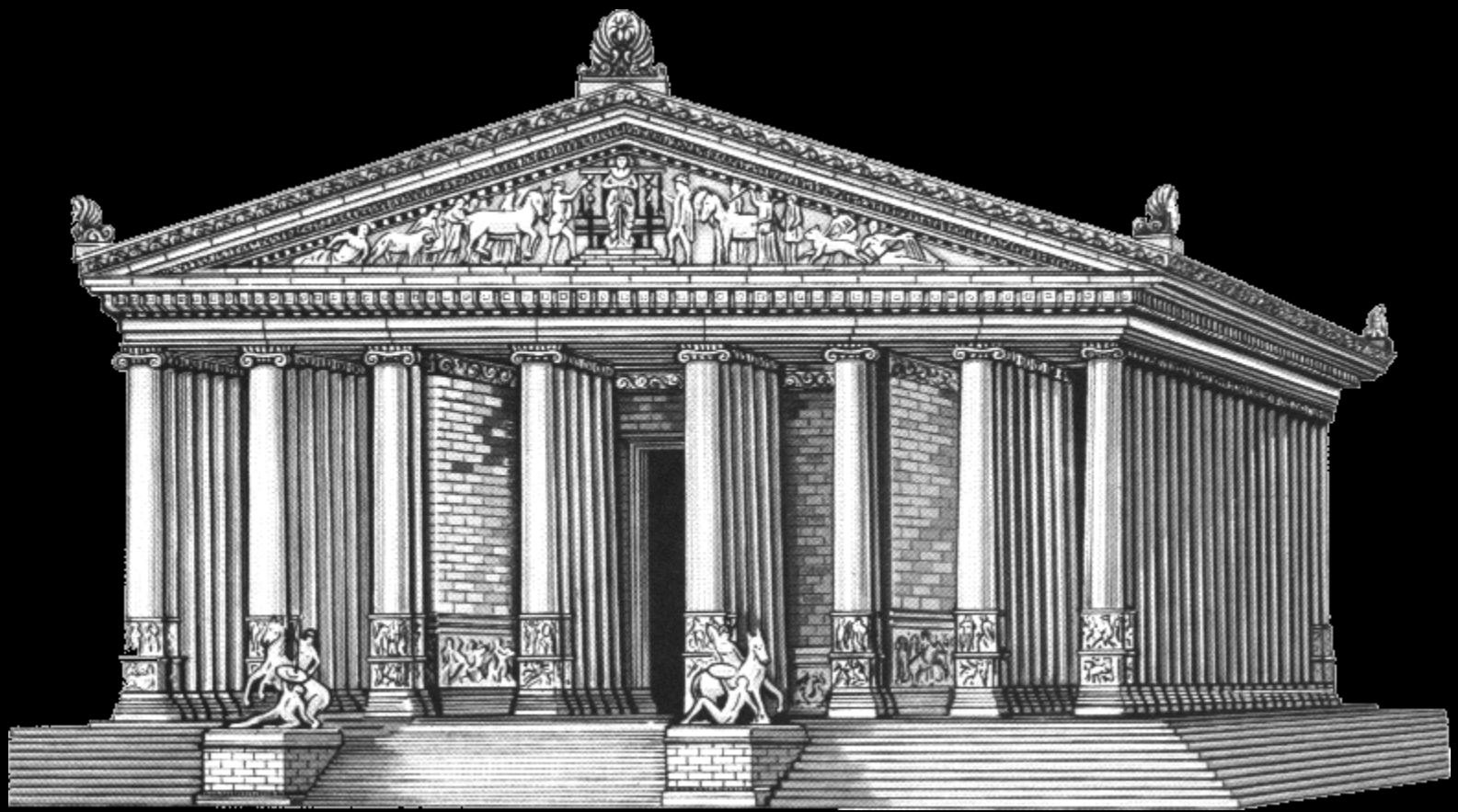
privacy

economics

behavioral decision research

data mining









Anonymity

Confidentiality

Solitude

Secrecy

Control over information

**Privacy**

Information security

Disguise

Obscurity

Seclusion

Autonomy

Right to be left alone



If you have something that you don't want anyone to know, maybe you shouldn't be doing it in the first place.

(Eric Schmidt)

[izquotes.com](http://izquotes.com)

## Giving You More Control

By Matt Hicks on Wednesday, October 6, 2010 at 11:13am

The biggest problem in social networking is helping you easily interact with your friends and share information in lots of different contexts.

For example, you might want to share photos from a family vacation with just your family, send a video from a party to just the people who were there, invite coworkers to an office event, play a game with a few friends, or use a running website with your friends who like jogging.

We've long heard that people would find Facebook more useful if it were easier to connect with smaller groups of their friends instead of always sharing with everyone they know. For some it's their immediate family and for others it's their fantasy football league, but the common concern is always some variant of, "I'd share this thing, but I don't want to bother 250 people. Or my grandmother. Or my boss."

Until now, Facebook has made it easy to share with all of your friends or with everyone, but there hasn't been a simple way to create and maintain a space for sharing with the small communities of people in your life, like your roommates, classmates, co-workers and family.



Notes by Facebook

All Notes

Embed Post



*“Targeting is **not only good for consumers [...]** it’s a rare **win for everyone.** [...] It ensures that ad placements display content that you might be interested in rather than ads that are irrelevant and uninteresting. [...] Advertisers achieve [...] a greater chance of selling the product. Publishers also win as [...] behavioral targeting increases the value of the ad placements.”*

*David Nelson, Operations & IT Director, Unanimis.co.uk*

Privacy is about having  
something to hide

Privacy is an individual responsibility  
problem, solvable by the market

Sharing personal data  
is an economic win-win

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**SAMPLE JOHN DOE CV & GRANTS**

UNIVERSITY OF PENNSYLVANIA - SCHOOL OF MEDICINE  
Curriculum Vitae

Date: Month, year  
John Doe, M.D., Ph.D.

Office Address: 1234 Maloney Building  
Hospital of the University of Pennsylvania  
Philadelphia, PA 19104-4283

If you are not a U.S. citizen please indicate the type of visa you have:  
(If applicable) Visa type or Permanent Resident status

Education:

|      |       |                                         |
|------|-------|-----------------------------------------|
| 1988 | B.S.  | Yale University (English)               |
| 1992 | M.D.  | University of Pennsylvania              |
| 1994 | Ph.D. | University of Pennsylvania (Physiology) |

Postgraduate Training and Fellowship Appointments:

|           |                                                                                          |
|-----------|------------------------------------------------------------------------------------------|
| 1994-1995 | Intern in Medicine, Temple Hospital, Philadelphia                                        |
| 1995-1996 | Resident in Medicine, Graduate Hospital, Philadelphia                                    |
| 1997-1999 | Fellowship, Pulmonary Diseases, Hospital of the University of Pennsylvania, Philadelphia |

Military Service:

|           |                                                                        |
|-----------|------------------------------------------------------------------------|
| 1996-1997 | U.S. Public Health Service, Tuberculosis Control Section, Philadelphia |
|-----------|------------------------------------------------------------------------|

Faculty Appointments:

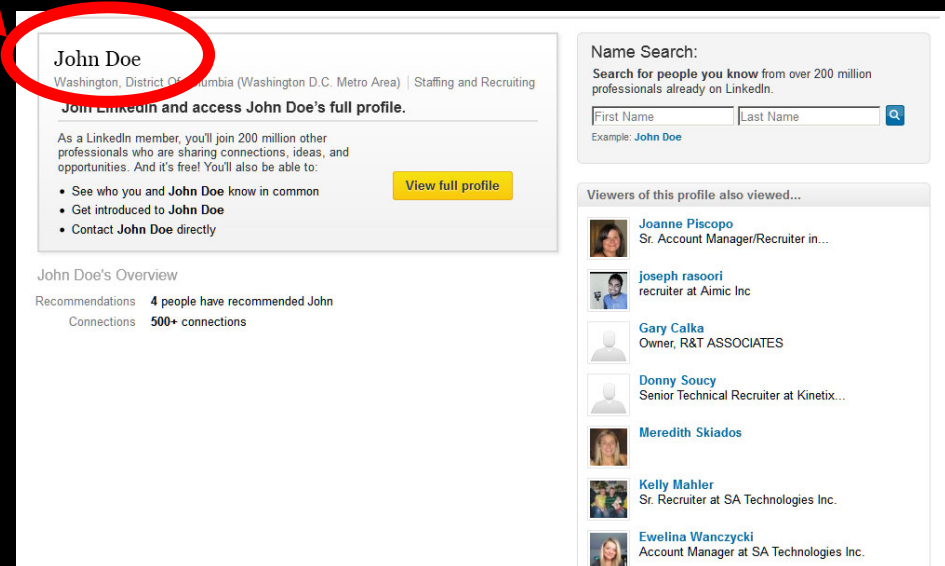
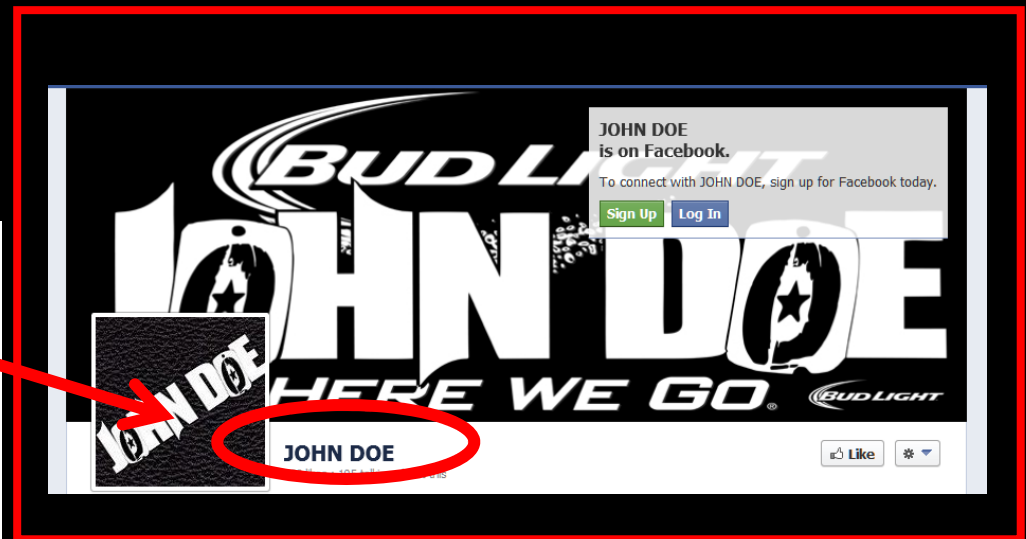
|                |                                                                                                          |
|----------------|----------------------------------------------------------------------------------------------------------|
| 1999-2008      | Assistant Professor of Medicine, Department of Medicine<br>University of Pennsylvania School of Medicine |
| 2008 - present | Associate Professor of Medicine, Department of Medicine<br>University of Pennsylvania School of Medicine |

Hospital and Administrative Appointments:

|              |                                                                                                                |
|--------------|----------------------------------------------------------------------------------------------------------------|
| 1999-present | Assistant Chief, Pulmonary Division, Department of Medicine,<br>University of Pennsylvania School of Medicine  |
| 2001-2005    | Chief, Pulmonary Function Laboratory, Department of Medicine,<br>University of Pennsylvania School of Medicine |
| 2005-present | Director, Inhalation Therapy, University of Pennsylvania School of Medicine                                    |

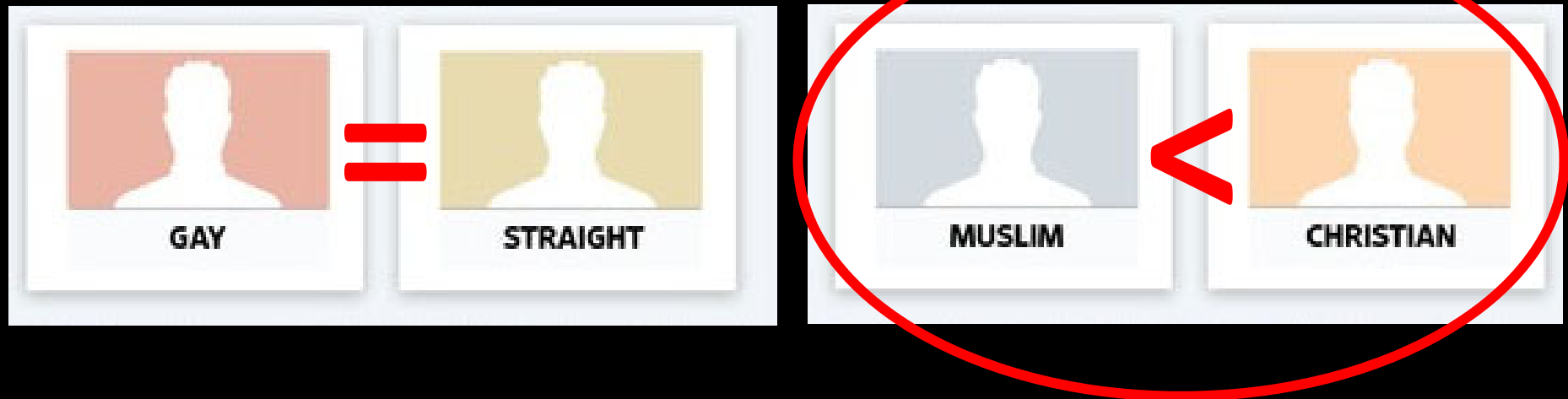
Other Appointments:

|              |                                                                                       |
|--------------|---------------------------------------------------------------------------------------|
| 1999-present | Senior Fellow, Leonard Davis Institute, University of Pennsylvania School of Medicine |
| 1999-present | Faculty Member, Cell and Molecular Biology Graduate Group, University of Pennsylvania |



**"An Experiment in Hiring Discrimination via Online Social Networks,"**  
Alessandro Acquisti and Christina Fong, *Management Science*, 2019.

## Callback rates



In conservative-leaning states, Muslim candidate **over 6 times less likely** than Christian candidate to be called for an interview

"An Experiment in Hiring Discrimination via Online Social Networks,"  
Alessandro Acquisti and Christina Fong, *Management Science*, 2019.



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Any personal data can become  
sensitive information

Privacy is an individual responsibility  
problem, solvable by the market

Control :: Privacy

+

Control :: Privacy

—





## Study on Ethical Behavior

**IMPORTANT:** All answers are voluntary. By answering a question, you agree to give the researchers permission to publish your answer.

|                                                                                  | Yes                   | No                    |
|----------------------------------------------------------------------------------|-----------------------|-----------------------|
| 1. Are you married?                                                              | <input type="radio"/> | <input type="radio"/> |
| 2. Have you ever been fired by your employer?                                    | <input type="radio"/> | <input type="radio"/> |
| 3. Have you ever stolen anything (e.g.: from a shop, a person)?                  | <input type="radio"/> | <input type="radio"/> |
| 4. Have you ever used drugs of any kind (e.g.: weed, heroin, crack)?             | <input type="radio"/> | <input type="radio"/> |
| 5. Have you ever lied about your age?                                            | <input type="radio"/> | <input type="radio"/> |
| 6. Have you ever had cosmetic surgery?                                           | <input type="radio"/> | <input type="radio"/> |
| 7. Have you ever done any kind of voluntary service?                             | <input type="radio"/> | <input type="radio"/> |
| 8. Have you ever had sex in a public venue (e.g.: restroom of a club, airplane)? | <input type="radio"/> | <input type="radio"/> |
| 9. Have you ever made a donation to a non-profit organization?                   | <input type="radio"/> | <input type="radio"/> |
| 10. Do you have any permanent tatoos?                                            | <input type="radio"/> | <input type="radio"/> |

Close

"Misplaced Confidences: Privacy and the Control Paradox," Laura Brandimarte, Alessandro Acquisti, and George Loewenstein. *Social Psychological and Personality Science*, 2013

qualtrics.com

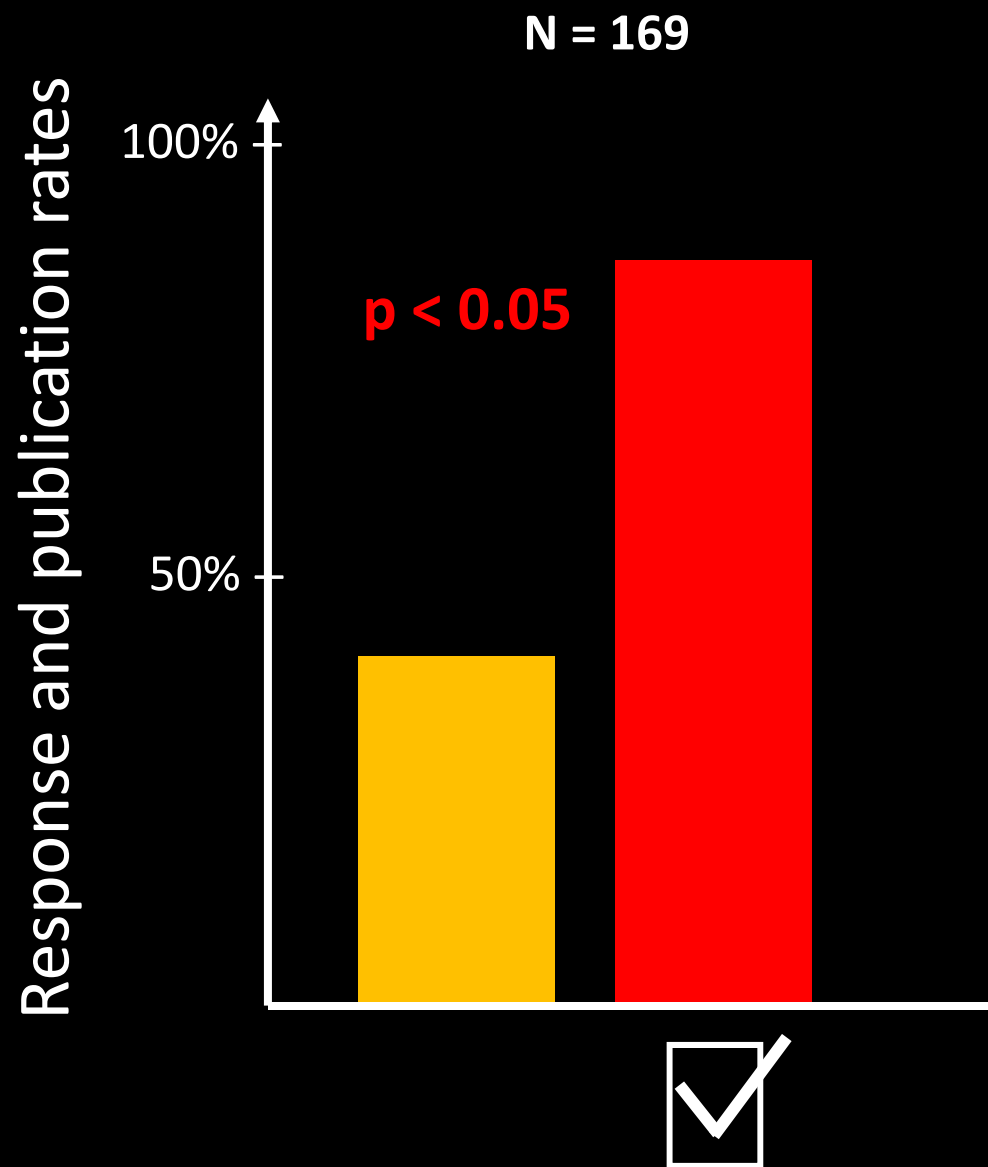
## Study on Ethical Behavior

**IMPORTANT:** All answers are voluntary. In order to give the researchers permission to publish your answer to a question, please check the corresponding box.

|                                                                                  | Publication permission   | Yes                   | No                    |
|----------------------------------------------------------------------------------|--------------------------|-----------------------|-----------------------|
| 1. Are you married?                                                              | <input type="checkbox"/> | <input type="radio"/> | <input type="radio"/> |
| 2. Have you ever been fired by your employer?                                    | <input type="checkbox"/> | <input type="radio"/> | <input type="radio"/> |
| 3. Have you ever stolen anything (e.g.: from a shop, a person)?                  | <input type="checkbox"/> | <input type="radio"/> | <input type="radio"/> |
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| 5. Have you ever lied about your age?                                            | <input type="checkbox"/> | <input type="radio"/> | <input type="radio"/> |
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"Misplaced Confidences: Privacy and the Control Paradox," Laura Brandimarte, Alessandro Acquisti, and George Loewenstein. *Social Psychological and Personality Science*, 2013



"Misplaced Confidences: Privacy and the Control Paradox," Laura Brandimarte, Alessandro Acquisti, and George Loewenstein. *Social Psychological and Personality Science*, 2013



Heinz College foyer



Facebook

"Faces of Facebook: Privacy and Face Recognition in the Age of Augmented Reality,"  
Alessandro Acquisti, Ralph Gross, and Fred Stutzman, *Journal of Privacy and Confidentiality*, 2014.

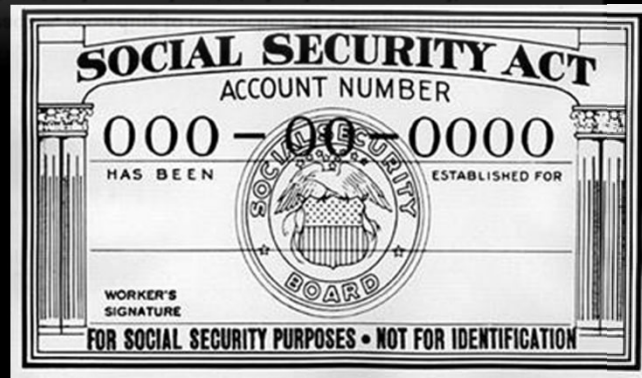
1 out of 3 subjects identified

"Faces of Facebook: Privacy and Face Recognition in the Age of Augmented Reality,"  
Alessandro Acquisti, Ralph Gross, and Fred Stutzman, *Journal of Privacy and Confidentiality*, 2014.





+



= SSN

"Predicting Social Security Numbers from Public Data,"  
Alessandro Acquisti and Ralph Gross, *Proceedings of the National Academy of Science*, 2009.



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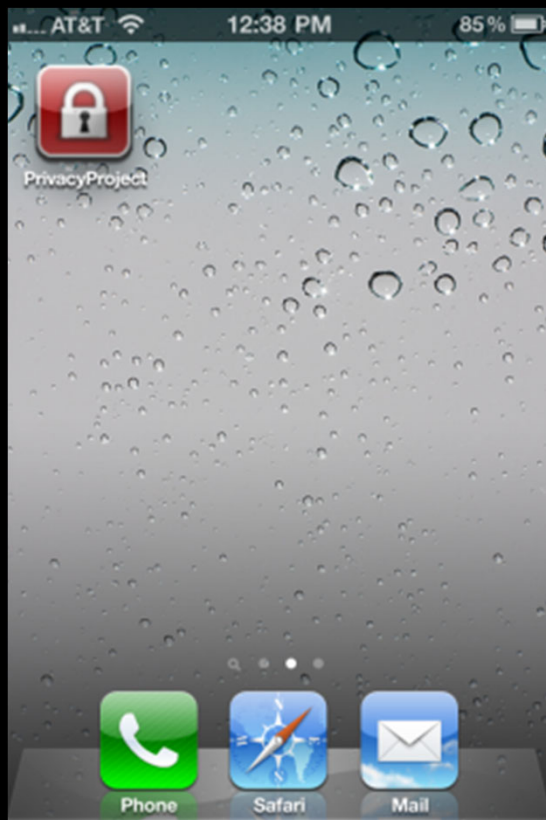
facebook®

= SSN

"Faces of Facebook: Privacy and Face Recognition in the Age of Augmented Reality,"  
Alessandro Acquisti, Ralph Gross, and Fred Stutzman, *Journal of Privacy and Confidentiality*, 2014.

27% of subjects' first 5 SSN digits  
identified (with 4 attempts)

"Faces of Facebook: Privacy and Face Recognition in the Age of Augmented Reality,"  
Alessandro Acquisti, Ralph Gross, and Fred Stutzman, *Journal of Privacy and Confidentiality*, 2014.

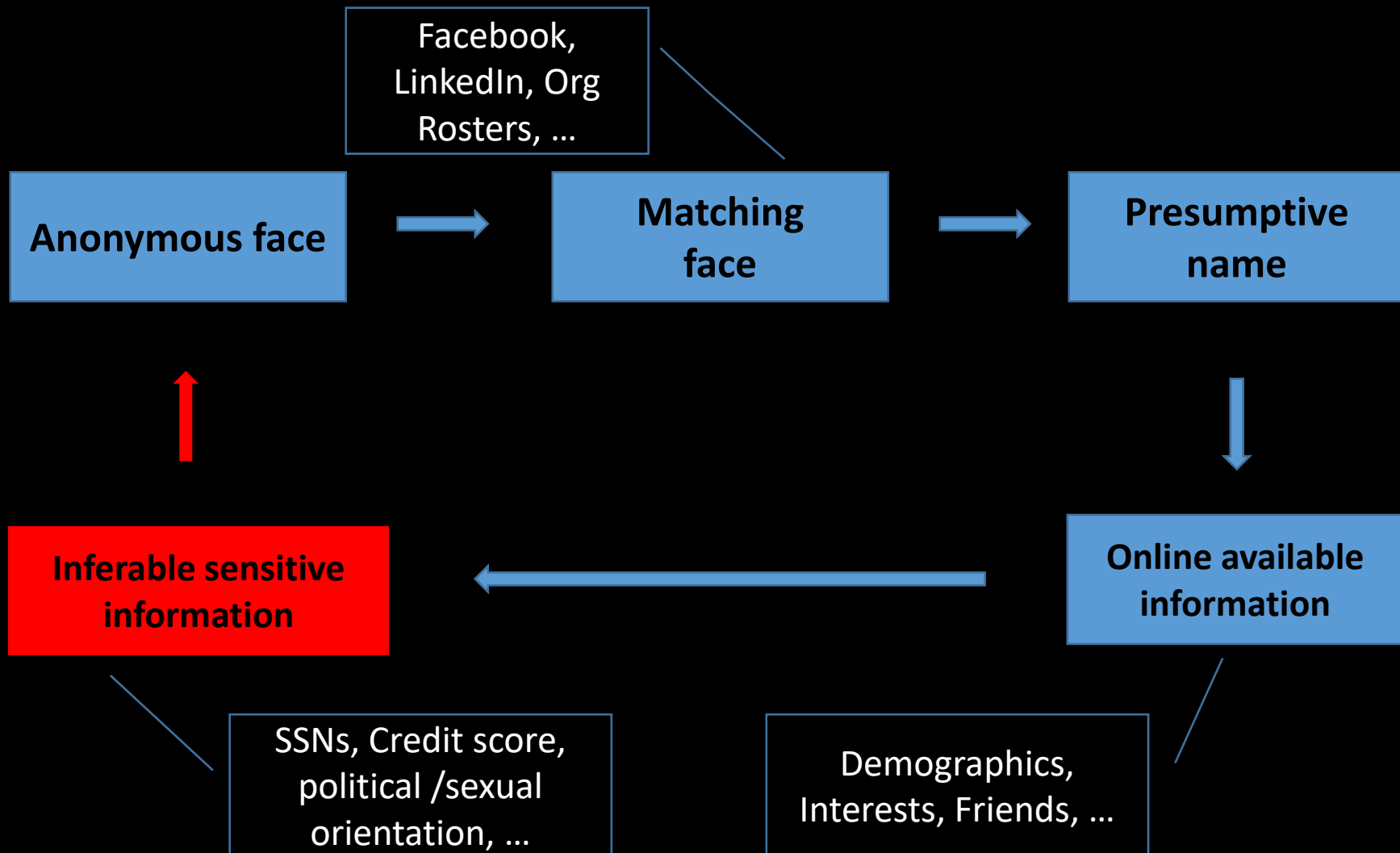


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Individuals can no longer effectively manage their privacy online

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# "DATA IS THE NEW OIL"

From the beginning of recorded time until 2000, we created 5 exabytes of data.

In 2011 the same amount was created every hour.

By 2015, it's expected that the time will shrink to 10 minutes.

7 billion DVDs.

There are nearly 100 million people in the digital world. In 2011, there were 100 million people in the digital world.

There are 139 million BLOGS in the world.

As of August 2012, there were 4 million articles in the English language.

80% of all business e-mails sent out of a laptop are in English.

247 billion EMAILS are sent every day.

60% of all e-mails are sent from a laptop.

10% of all e-mails are sent from a laptop.

50% of all e-mails are sent from a laptop.

These specialized algorithms can detect patterns in data that are not visible to the human eye.

With new fiber-optic cable, the round-trip time between New York and London will be 10 milliseconds.

How they save 5 milliseconds: The depth of the Atlantic Ocean varies. The new cable will sit at the bottom of the ocean floor that is 20 to 3,000 feet shallower than the current fiber-optic cable. By taking a different route, the new cable is able to travel a shorter distance, saving time.

The cable will also be able to carry more data than the current cable.

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DATA IS THE NEW OIL

DATA IS THE NEW OIL  
CLIVE HUMBY, 2006(!)

DATA is the new oil

CISCO

## Data is the new oil.

We see in data the same transformative, wealth-creating power that 19th-century visionaries once sensed in the crude black ooze trapped underground.

If "crude" data can be extracted, refined, and piped to where it can impact decisions in real time, its value will soar. And if data can be properly shared across an entire ecosystem and made accessible in the places where analytics are most useful, then it will become a true game changer, altering the way we live, work, learn, and play.

Source: Cisco IBSG, 2012. #DataInMotion

Data is the new Oil

## The Economics of Privacy<sup>†</sup>

ALESSANDRO ACQUISTI, CURTIS TAYLOR, AND LIAD WAGMAN\*

*This article summarizes and draws connections among diverse streams of theoretical and empirical research on the economics of privacy. We focus on the economic value and consequences of protecting and disclosing personal information, and on consumers' understanding and decisions regarding the trade-offs associated with the privacy and the sharing of personal data. We highlight how the economic analysis of privacy evolved over time, as advancements in information technology raised increasingly nuanced and complex issues associated with the protection and sharing of personal information. We find and highlight three themes that connect diverse insights from the literature. First, characterizing a single unifying economic theory of privacy is hard, because privacy issues of economic relevance arise in widely diverse contexts. Second, there are theoretical and empirical situations where the protection of privacy can both enhance and detract from individual and societal welfare. Third, in digital economies, consumers' ability to make informed decisions about their privacy is severely hindered because consumers are often in a position of imperfect or asymmetric information regarding when their data is collected, for what purposes, and with what consequences. We conclude the article by highlighting some of the ongoing issues in the privacy debate of interest to economists. (JEL D82, D83, G20, I10, L13, M31, M37)*

### 1. *Why an Economics of Privacy*

The value and regulation of information assets have been among the most interesting areas of economic research since

Friedrich Hayek's 1945 treatise on the use of knowledge in society. Contributions to what has become known as the field of *information economics* have been among the most influential, insightful, and intriguing in the

**"The Economics of Privacy," Alessandro Acquisti, Curtis Taylor, and Liad Wagman.  
*Journal of Economic Literature*, 2016.**

*When is privacy protection  
welfare enhancing/decreasing?*

*When do consumers benefit  
from trades in their data?*

*How is the surplus generated by  
personal data allocated?*

*Who bears the costs of privacy  
enhancing technologies?*

Across several ongoing economic experiments, we are finding....

- That the allocation of surplus from behavioral tracking and targeted advertising changes dramatically with the amount and type of data collected – consumers benefit from some information being shared, but not other
- That when contextual ads (aka sponsored results) are blocked in search engine results, consumer welfare does not decrease (and some measures of satisfaction increase)
- That for online publishers, the revenue increase associated with targeted ads (relative to untargeted ones) is just 4%



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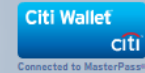




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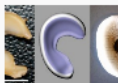
This Guy Took 4  
Leafblowers And  
A Skateboard...  
*3 days ago*



Chromecast  
Finally Gets That  
Kind-Of-Magic...  
*4 days ago*



Tinder  
Competitor  
Hinge scores  
*4 days ago*



Doctors Can Now  
Successfully 3D  
Print A Knee  
*2 hours ago*



An Open Letter  
To Tim Cook  
About Game  
*18 hours ago*



Yahoo Starts  
Prompting  
Chrome Users...  
*3 days ago*

## Google's Cerf Says "Privacy May Be An Anomaly". Historically, He's Right.

Posted Nov 20, 2013 by [Gregory Ferenstein \(@ferenstein\)](#)

1,812  
SHARES



One of the original architects of the Internet wants to remind us that privacy is a relatively new concept. "Privacy is something which has emerged out of the urban boom coming from the industrial revolution," [said](#) Google's Chief Internet Evangelist and a lead engineer on the Army's early 1970's Internet prototype, ARPANET. As a result, 'privacy may actually be an anomaly,' he told a gathering of the Federal Trade Commission.

Looking back at history, Cerf is mostly right.

Up until the 19th century, most houses had few or no internal walls. [Bathing was a public act.](#) For most of the post-Roman era, the very concept of "solitude" [was limited to clergy](#), who dedicated their lives to private worship. "Intercourse, birth, death, just about every aspect of the life cycle plays out with some sort of audience," architectural historian Bernard Herman explained to me.

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### Tech Champs Vs. Threats

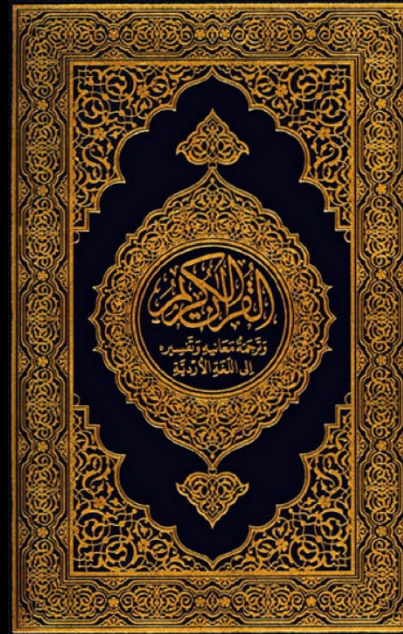
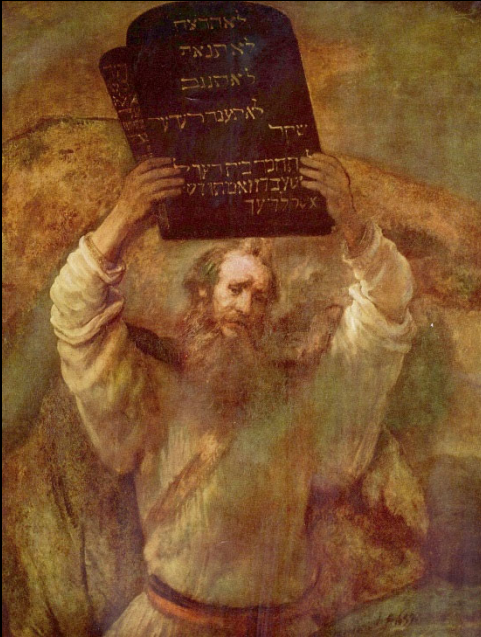


ERIC CANTOR



LAMAR SMITH









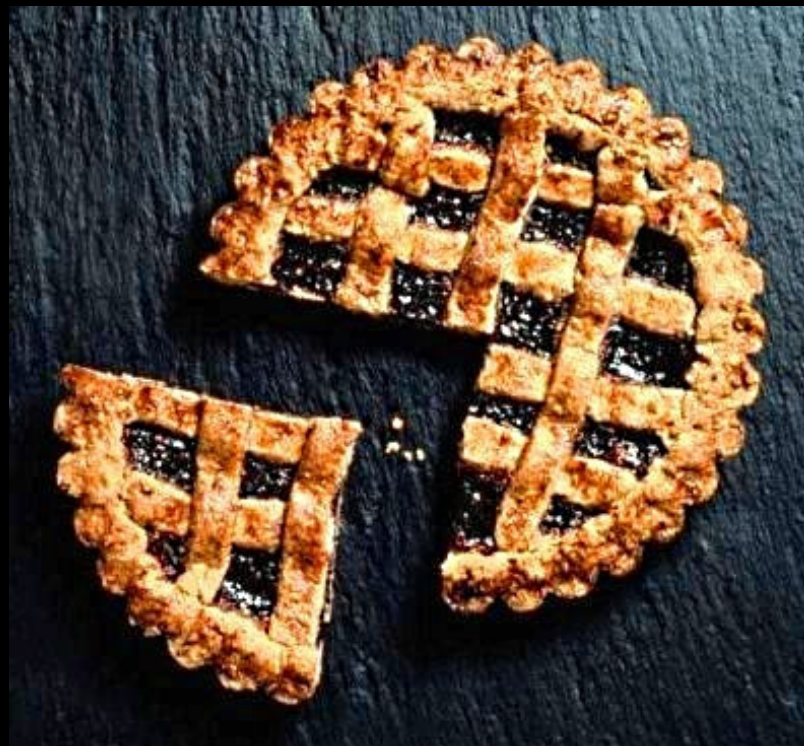




*Are there evolutionary roots to privacy concerns?*

"The Sense of Privacy," Alessandro Acquisti, Laura Brandimarte,  
and Jeff Hancock, *under review*.

*Altman (1977): Privacy is simultaneously culturally  
universal and culturally specific*



# For more information

1. “The Economics of Privacy,” Acquisti, Taylor, and Wagman, *Journal of Economic Literature*, (2016)
2. “Privacy and Human Behavior in the Age of Information”, Acquisti, Brandimarte, and Loewenstein, *Science*, (2015)
3. <http://www.heinz.cmu.edu/~acquisti/>  
(or google/bing “economics privacy”)