

MIS 0855 Fall 2016 – Data Science

Week 1 – Data and Science

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Sep. 1st, 2016

Data and Science

- Why do you think this course is called “Data *Science*”?
- What is science?
 - A collection of *proven* knowledge that
 - *explains* what is happening and
 - *predicts* what will happen.



<http://escience.washington.edu/blog/uw-berkeley-nyu-collaborate-378m-data-science-initiative>

Data, Information, and Knowledge

- For knowledge to be useful for informed decision making,
- it needs to be based on facts substantiated by data and information.
- So, how to build knowledge from data and information in a *scientific* manner?
- by devising formal hypotheses and testing them with data

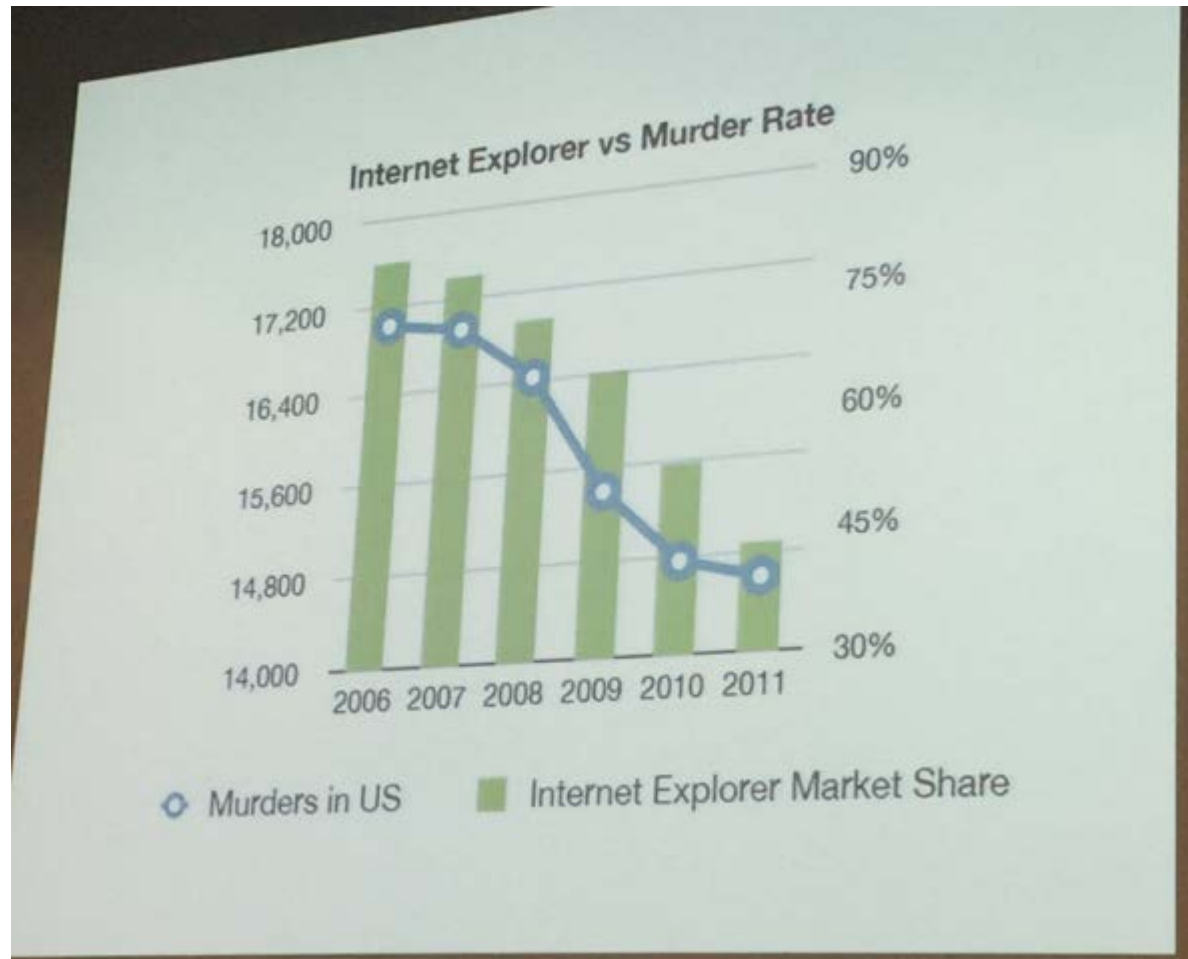
A Hypothesis Should Be (1/2)

- *Testable* – be able to be measured by data
- *Falsifiable* – be able to be proven false by data
- *Grounded in a theory* – be able to be explained by sensible rationale(s)

A Hypothesis Should Be (2/2)

	Good	Bad
Testable	iPhone users download more apps each month than Android users.	iPhone users are better than Android users.
Falsifiable	There are no vampires living in Louisiana.	There are vampires living in Louisiana.
Grounded in a theory	Students who attend class more often get better grades.	Students who are taller attend class more often.

Any Theory or Rationale Behind This? (1/3)



Any Theory or Rationale Behind This? (2/3)

Daily **Mail**
.com

Fatherhood makes men FAT: New dads gain an average of 4lbs in the years after their first child is born

- Men who became fathers saw an average 2.6 per cent rise in their BMI
- For a 6ft man, is equivalent of putting on 4.4lb (2kg) from birth of first child
- However men who had no children actually lost around 1.4lb in weight



http://www.ozy.com/acumen/in-sickness-and-in-health-but-not-in-debt/38366?utm_source=A1&utm_medium=pp&utm_campaign=pp
<https://www.pinterest.com/pin/218072806933122983/>

Any Theory or Rationale Behind This? (3/3)

THE WALL STREET JOURNAL.

LAW BLOG

Study Links Police Bodycams to Increase in Shooting Deaths

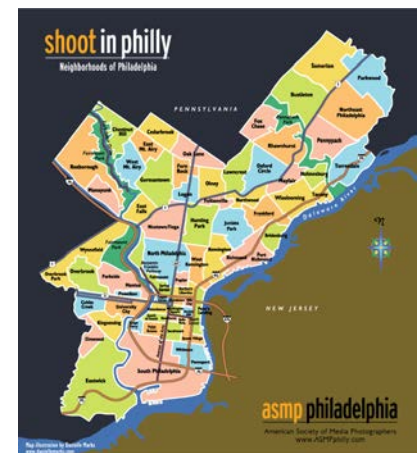


PHOTO: ASSOCIATED PRESS

<http://blogs.wsj.com/law/2016/08/12/study-links-police-bodycams-to-increase-in-shooting-deaths/>

Create your own hypotheses (1/2)

- “Neighborhood A in Philadelphia is more dangerous to live in than Neighborhood B.”
- How would you make this more testable?
- What is the theory/rationale behind your hypothesi(e)s?



<http://www.daniellemarks.com/Philly%20Neighborhoods.html>

Create your own hypotheses (2/2)

- “Temple University is greater than Drexel University.”
- How would you make this more testable?
- What is the theory/rationale behind your hypothesi(e)s?



In-Class Exercise (Group) – What is a Theory or Rationale Behind This?

In Sickness and in Health ... but Not in Debt



Couples spend \$30,000 on average planning their Big Day ... but the more you spend, the shorter your marriage is.

- *Guys, investing between \$2,000 and \$4,000 on an engagement ring means you're 1.3 times more likely to get divorced compared with the more frugal fellows who only allocate between \$500 and \$2,000.*
- *For both sexes, spending more than \$20,000 on the wedding ups the odds of divorce by 3.5 times compared with couples who keep it between \$5,000 and \$10,000.*