

MIS 0855 Spring 2015 – Data Science

Day 3 – Data and Science

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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

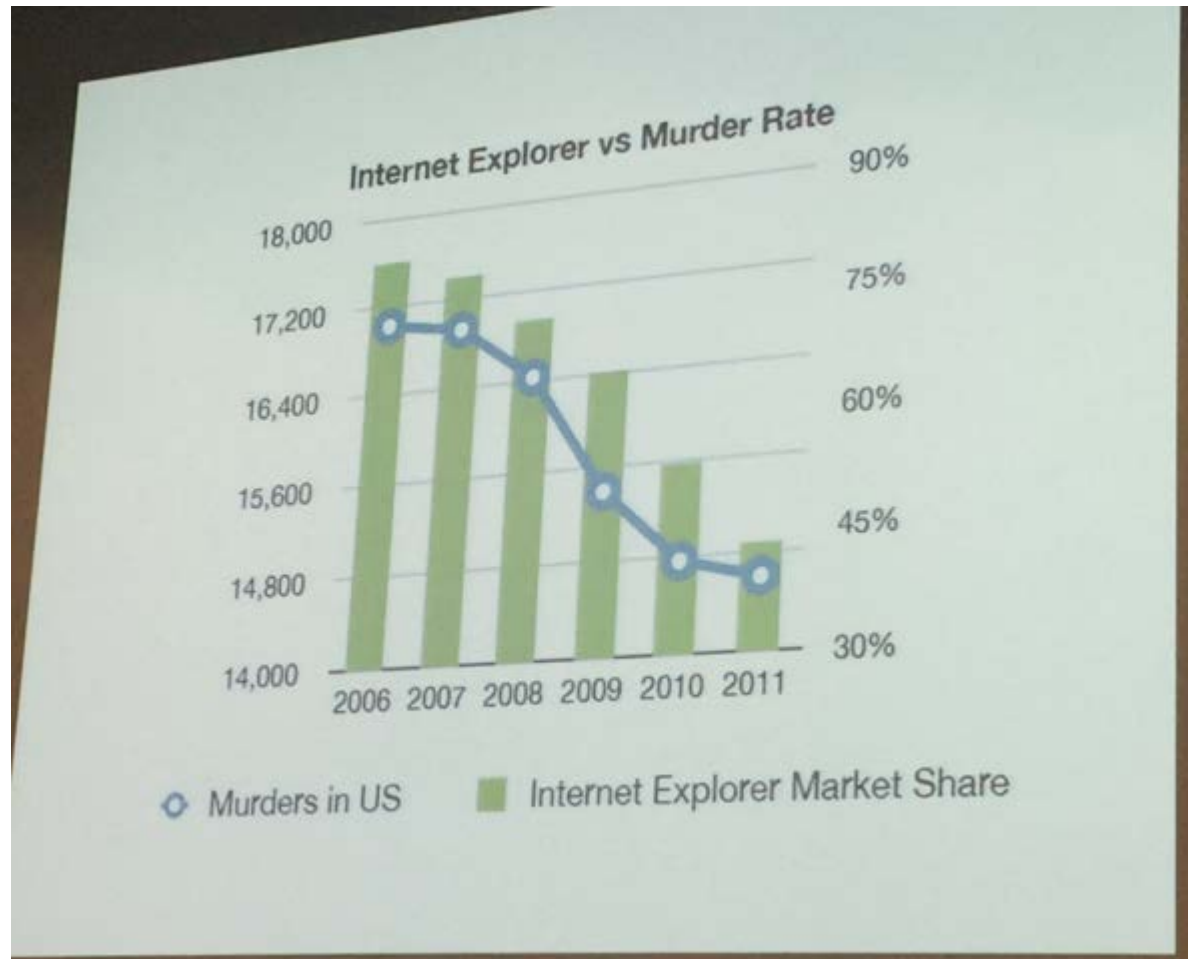
A Hypothesis Should Be (1/2)

- *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? (1/2)



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

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

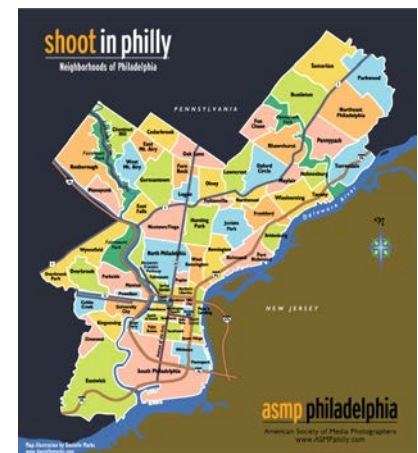


Couples spend \$30,000 on average planning their Big Day ... but the more you spend, the shorter your marriage is.

- 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.

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?

