Overview

scientific vs nonscientific approach

research process
  research question
data and method: experiment and observational

worksheet

Why using scientific methods?

the urge to understand and explain

truth: being in accordance with fact or reality

Scientific vs. non-scientific approach

non-scientific approach...
  based on intuition, gut reactions, personal experience

scientific approach...
  evidence-based, systematic, logical
Scientific vs. non-scientific approach

- typical errors in non-scientific approach:
  - a measurement may not actually measure what we want to measure
    - self-reported health vs. physical exam
  - a conclusion may not be generalized to the population
    - association = causality

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Association = Causation?

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Scientific vs. non-scientific approach

- non-scientific approach...
  - based on intuition, gut reactions, personal experience
  - unreliable, invalid conclusions

- scientific approach...
  - evidence-based, systematic, logical
  - reliable, valid conclusions

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Why using scientific methods?

- closer to the truth
Scientific research: How do we do it?

- Research question
- Scientific method to collect data
- Scientific method to analyze
- Conclusion

Research question
what to study?
some aspects of outcome/behavior
- crime and deviance;
- health;
- death;
- sexuality;

Scientific methods and data
how researchers examine the question
different types of methods and data:
- experiment or observational study

Experiment
a procedure to verify, refute, or validate a hypothesis
the most “rigorous,” “gold standard” to establish cause-effect inference.
Experiment

three aspects:

* manipulate **one and only one** factor: treatment vs control
* random assignment
* assessment of change in the outcome

Experiment: Examples

effectiveness of a new drug
loosing weight: running vs. weight-lifting
shelf-life of yogurt: 35F vs. 10F

Observational study

most common in social sciences research

the “treatment” is not manipulable

* gender,
* ethnicity,
* socioeconomic status,
* height

Observational study

types of observational study:

* case-control study
* survey
* ethnography

...
The most hated team in the NFL

Public Policy Polling asked 410 self-described fans on Feb. 2 and 3 about what NFL team that they hate most.

Survey: Example

Question: How are police and detectives paid relative to other occupations in 2012?

Method: Survey a sample of all Americans, asking them about their occupation and salaries.

Data: two numbers for each participation

Choice between experimental and observational methods

what types of data and methods can answer your question best?
In-class exercise (worksheet)

guess the % of countries in the United Nations that are in Africa

In-class exercise (worksheet)

anchoring effect:
the estimate of an unknown quality is influenced by a previously supplied starting point.

In-class exercise (worksheet)

Survey or experiment?