

STAT 401A - Statistical Methods for Research Workers

Statistical Inference

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3 Sep 2013

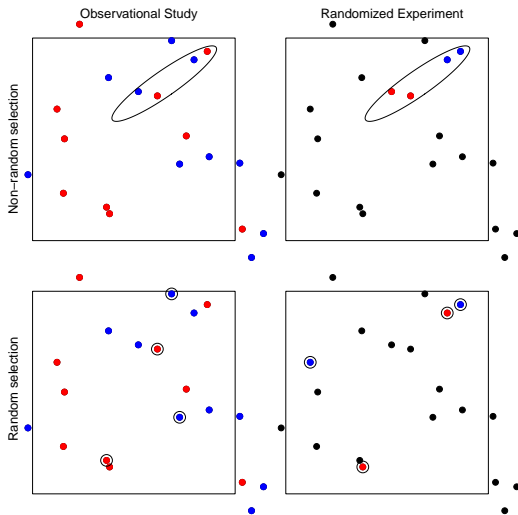
Statistical inference

Definitions

- Inference: a conclusion reached on the basis of evidence and reasoning
- Causal inference: making a conclusion that one variable (treatment) causes a change in another variable (response)
- Inference to population: a conclusion made about the entire population under study

	Observational Study	Randomized Experiment
Non-random Selection		Causal Inference
Random Selection	Inference to Population	Causal Inference to Population

Graphical representation



Examples

- I compare the heights between male and female students in STAT 401A.
- I assign you randomly to the 2:10-3pm or 3:10-4pm version of the lab and compare your average midterm grades.
- I randomly sample ISU students with GPA above and below 3 and compare the number of facebook friends in the high and low GPA samples.
- I randomly sample ISU students randomly assign them to the facebook group or no facebook group and measure GPA for a year.

Summary

- Random treatment assignment \rightarrow causal inference
- Random sampling \rightarrow inference to population