Lesson 12 - Causation (4.1 - 4.2)

Lesson Objectives: 1. Association vs. Causation
2. Random Assignment vs. Random sampling

Associated - one variable gives information about the other

Cause and Effect - one variable causes a change in the other

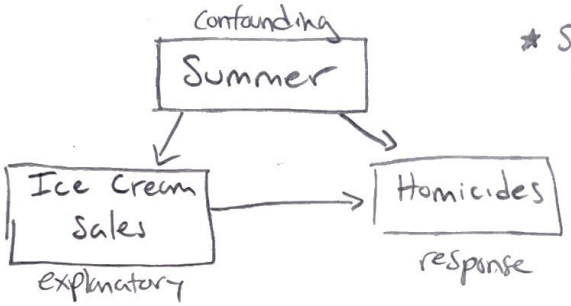
Explanatory variable - The cause

Response variable - The effect

Confounding variable - Related to both

The possible presence of confounding variables is the reason why association ≠ causation.

Causal Diagram



* Spurious Correlations

Mitigate confounders through a random experiment

Random Assignment - Randomly assigning experimental units to groups tends to balance out all other variables between the groups.

- Any variables that could have an effect on the response should be equalized between the two groups and therefore should not be confounding

* Balances out confounding variables *

Random Experiment

Random sample	Random assignment: Yes	Random assignment: No
Yes	Mitigates Bias, mitigates confounders	Mitigates Bias → Infer to population
No	Mitigates confounders	

↓

Infer cause & effect

Observational Study vs. Experiment → groups created, experimenter assigns treatment + control
↳ comparing groups + data that is just there.

Blind and double blind.