# Intro to Stats

Methods Overview

## The goals of science

- Description: What happens?
- Prediction: When does it happen?
- Explanation: Why does it happen?
  - Theory
  - Causal Inferences
- Intervention/Application: What could be done to help?
- These all build on each other

## Self Report

- Self-report methods: ask participants to tell you
  - Interviews
  - Questionnaires
  - Daily diary methods

Fixed response scale
Open-ended question

## Observational Data

- Observational Data
  - Observations in natural settings
  - Laboratory-based observation

## Archival Research

- Researchers examine existing data that may or may not have been intended for research
- Harker and Keltner (2001) used yearbook pictures to predict marital outcomes 30 years later

## Correlational Research

- Assess the naturally occurring associations among two variables
  - Positive correlation
    - rewards are positively associated with satisfaction
  - Negative correlation
    - conflicts are negatively associated with satisfaction

## Correlation does not imply causation!

- Three possible interpretations of any correlation
  - X may cause Y
    - TV causes violence
  - Y may cause X
    - Violence causes TV watching
  - Both X and Y may be the result of some other cause
    - Low parental supervision = violence & TV
    - Ice cream & murder rates

## Longitudinal Research

- Data collected at 2 or more time points
- Associations among variables across time
- How are feelings of love across time associated with divorce?

## Experimental Research

- Manipulate one variable to see if it causes changes in another variable.

$$A \longrightarrow B$$

- Does arousal lead to greater liking?

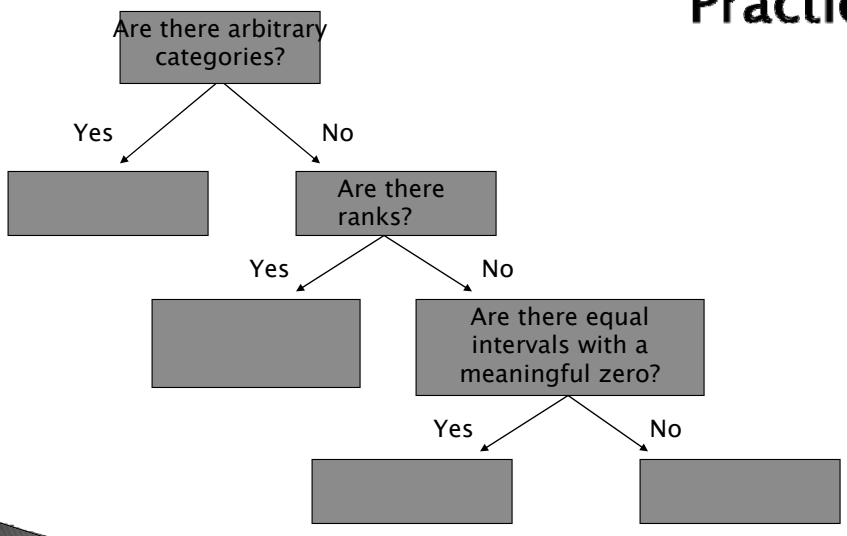
## Testing the WHATs and WHYs

- 1:1 correspondence
  - If you pour x into y, you know x caused the explosion
  - If you pour x and z into y, you don't know what caused the explosion
- Random Assignment
  - In large enough samples, characteristics will be equally distributed

# 4 scales of measurement

- Scale determines what analyses you can run
- Nominal
  - Categories (gender, race)
- Ordinal
  - Ranks (small, medium, large; freshman, sophomore, junior, senior)
- Interval
  - Ordered with equal intervals, no zero (survey item)
- Ratio
  - Ordered, equal intervals, zero (time; Kelvin temp)

# Practice



## Reflecting on Scales

- Any outcome can be assigned as one type of scale
- Nominal is least precise, ratio most precise
- The more precise, the more informative your data will be
- More precise scales include all qualities of the scales below them

*Ratio scales seldom exist in behavioral research