Variables

• Most studies examine the effect of one variable on another

• Independent Variable = Affecting variable

• Depending Variable = Affected variable

• Example:
  • Effect of focused-themed office hours (IV) on absenteeism (DV)
Operationalizing Variables

• Figuring out how to measure and analyze variables

• Variables are often measured using either...
  • Continuous Scale
    • Numerical scale that includes more than 2 values
    • GPA, hours studied, “On a scale from 1 – 10...”
  • Categorical Scale
    • Non-numerical scale
    • Yes or no, True or false, “What’s your favorite topic?”
Operationalizing Variables

• Independent variables can be continuous or categorical

• Continuous IV example:
  • Effect of number of office hours (IV) on scores (DV)
  • IV comprises number of office hours allotted to students, which can vary numerically (1, 2, 3 hours)

• Categorical IV example:
  • Effect of exit slips (IV) on course evaluations (DV)
  • IV comprises 2 groups, those who use exit slips and those who don’t
Operationalizing Variables

• Continuous scales are always preferred for dependent variables

• Example item...
  • “Do you feel prepared for class?”
    • Yes or no
  • “How prepared do you feel for class?”
    • 1 = Not at all
    • 2 = A little
    • 3 = Somewhat
    • 4 = Quite a bit
    • 5 = A lot

Way better!
• More response options
• More informative
• Can perform statistical tests
Types of Analyses

• Analyses depend on if you’re looking for...
  • A difference between groups or time-periods
    • Difference in scores between two sections of a class
    • Difference in questions answered correctly between beginning and end of course
  • A relationship between two continuous variables
    • Relationship between time students spent in office hours and grades
  • Predicting one continuous variable from another
    • Number of review sessions predicts students’ exam scores
Types of Analyses

• Differences between groups or time periods...
  • You will use an **ANOVA** to analyze your data
    • Between groups = One-way ANOVA
    • Between time periods = Repeated-measures ANOVA

• Relationship between variables...
  • You will use **Pearson correlation** to analyze your data

• Predicting one variable from another...
  • You will use **regression** to analyze your data
Advanced Methods of Analysis

• Examining the effect of multiple independent variables on a dependent variable

• Using multiple independent variables to predict a dependent variable

• Examples:
  • What is the impact of focused-themed office hours (IV #1) AND student reflections (IV #2) on student learning outcomes (DV)
Advanced Methods of Analysis

- Examining the effect of multiple independent variables on a dependent variable
  - Uses factorial ANOVA
  - Can uncover interactions
    - Effect of one independent variable depending on another

- Using multiple independent variables to predict a dependent variable
  - Uses multiple regression
  - Can see which predictors are the strongest
Conducting Analyses

• All of these analyses can be done using SPSS
  • Provided free to all UCM faculty members

• Go to: http://it.ucmerced.edu/software-list/
  • Install SPSS for Faculty/Staff using “Install (Apporto)”

• Instructions on conducting analyses
  • Many YouTube instructional videos are available

• Laerd Statistics: Professional guidance can be found at statistics.laerd.com ($6 per month)