

Primer on Conducting Research

FACULTY ACADEMY ON TEACHING
FIRST-YEAR STUDENTS



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
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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)