Causal-Comparative Research Design

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Overview

• Definition
• Characteristics
• When To Use
• Grouping
• When Not To Use
• Steps Involved
• Research Examples
• Data Analysis
• Statistics
• Limitations
What’s in a name?

Ex Post Facto  Descriptive

Retrospective  Causal-Comparative
Definition

• Non-Experimental Designs that investigate causal relationships
• Researchers try to identify the causes of differences that already exists within individuals or groups

3 Types

• Exploration of Effects
• Exploration of Causes
• Exploration of Consequences
Characteristics

• Pre-existing Differences or conditions

• Pre-existing groups

• No control

• No manipulation

• Can make reasonable inferences about causation
When to use

• When variables cannot be manipulated

• When experiments are not possible

• Attempts to identify causes or consequences while the assumption of this design is inaccurate and not always true

• Attempt to understand cause and effect
Grouping

- Pre-formed groups
- Subject matching
- Homogeneous groups
- Differences within groups
When not to use

- Two or more groups are different
- Comparisons are different
- Retrospective mostly in Educational Research
- When you cannot manipulate variables because in doing so may cause mental or physical harm
Steps Involved

- Develop the research question

- Identify the independent and dependent variable

- Select **two** comparison groups

- Collect data from pre-existing data

- Analyze and interpret the data

- Report findings
Research Examples

• Compare the body composition or weight loss of people who only use free weights vs. people who only use exercise machines.

• The effects of drinking large amounts of soda on childhood obesity.

• Non ADHD Brain vs. ADHD Brain and brain size.
Data Analysis & Interpretation

• Descriptive statistics
  • Mean
  • Standard Deviation

• Inferential statistics
  • T-test
  • Analysis of variance
  • Chi square
Statistics

• Compare averages
• Use Crossbreak Tables
• Independent or Dependent T-Tests
• T-tests for comparison of two groups
• ANOVA for comparison of more than two groups
• Chi-square for comparison of group frequencies between groups
Limitations

• There must be a pre-existing independent variable and you cannot manipulate it

• There is a lack of randomization

• Inappropriate interpretations can occur: making it hard to identify cause and effect relationships

• There are often other variables that affect the dependent variable instead of the independent variable

• Reversal causation may exist

• Possibility of subject selection bias

• Other threats: location, instrumentation, and loss of subjects

• Caution in interpreting results
Resources


Questions