Research Strategies

PSY 4433

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Research Strategies

- **research strategy** is the approach to research determined by the resaerch question you hope to answer
  - considering research questions you may have
  - What type of design and analysis would be appropriate

Descriptive Research Strategy

- not interested in the relationship between two variables

  - **descriptive research strategies** are interested in the description of individual variables

- What is the average age in the sample?

- What is the proportions are the different groups in your sample?

- How many participants did not answer certain questions?

Strategies that Examine Relationships Between Variables

- **positive relationship** is when IV increases, your DV increases

    - **negative/inverse relationship** is when IV increases, your DV decreases (or vice versa)

- **linear relationship** is when the data points for your IV and DV show a line as the best-fitting model

    - **curvilinear/quadratic relationship** is when the data points for your IV and DV could be better explained using a curved line

Example
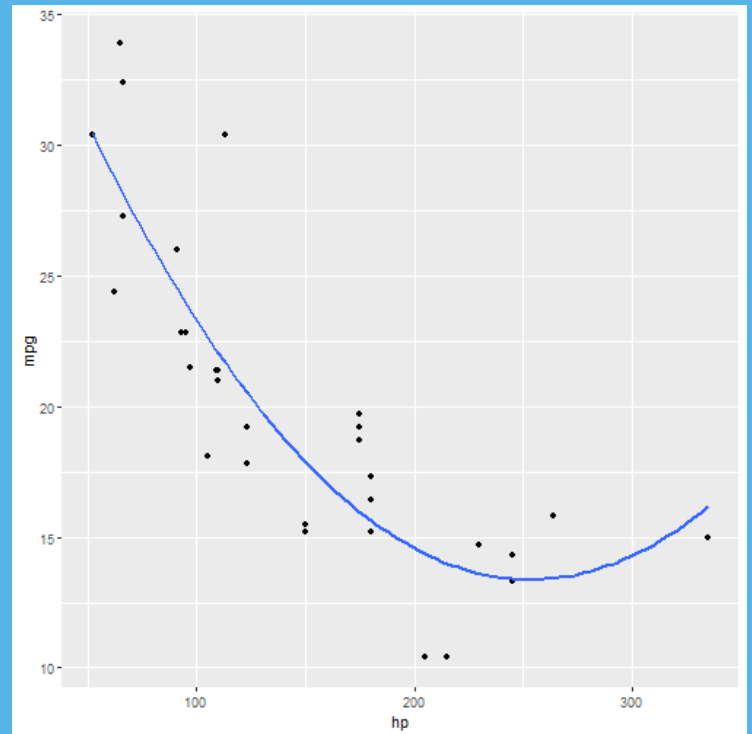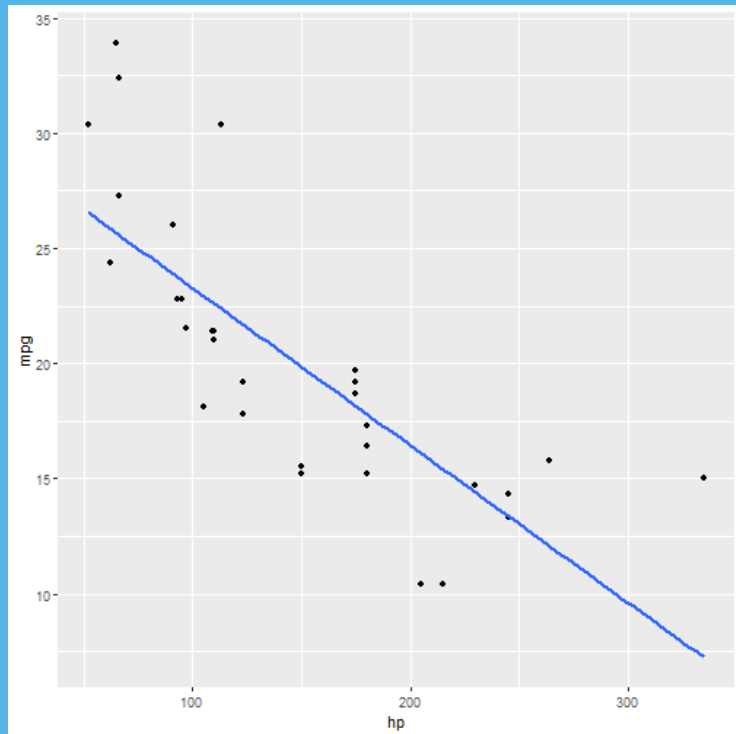
Correlational Research Strategy

- **correlational research strategy** is used for examining two continuous variables

  - ratio or interval
  - shows potential relationships but does not explain the relationship

- uses a scatterplot (previous slide) to see the corresponding points for participants between IV and DV

Comparing Two+ Sets of Scores

- **experimental research strategies** is supposed to show a cause-effect relationship between two variables

  - needs two or more conditions to compare outcome on
  - Ex: control vs treatment 1 vs treatment 2
  - should have a random selection and assignment component

- **quasi-experimental research strategies** tries to match control of experiments, but cannot have a true cause-effect relationship

  - there is no random assignment and groups are created/chosen in other ways
  - Ex: Comparing teaching strategies for each 4433 class with test scores

- **nonexperimental research strategy**

  - does not try to establish cause-effect relationship
  - chooses groups but does not incorporate any sort of treatment
  - Ex: do males and females differ in amount of time on phones

Nonexperimental and Correlational Research

- very similar, however the data structure looks differently
  - all the same limitations
  - only difference is the data structure

5 Research Strategies Organized By Data Structures

1. Strategies that Examine Individual Variables

2. Examine relationship between two or more variables for each participant (study time and sleep)

3. Cause-effect relationship with random selection and assignment

4. Attempt to produce cause-effect relationship, but no random selection and assignment

5. Examine relationship between groups and outcome (sex and sleep)

Strategies, Designs, & Procedures

- **research strategies** are to have an approach to a research question for your study

- **research designs** is how you plan to implement your research strategy

  - group vs individual
  - same individuals vs different individuals
  - number of variables to be included

- **research procedures** are step-by-step description of your research study

  - how will your IV be manipulated
  - will there be deception
  - how many participants

Research Designs

- group vs individual

  - will you be comparing groups or examine all participants

- same individuals vs different individuals

  - will you be looking at the same participants over time while they receive all conditions
  - will you be comparing different groups
  - how will you be selecting these groups

- number of variables to be included

  - are you looking at one IV and one DV
  - are you going to look at several IVs and several DVs
  - are you going to look at one IV with different conditions and analyze these groups with different DVs

Data Structures & Statistical Analysis

- we'll be focusing on repeated measures, factorial, or mixed ANOVAs
  - these tests all focus on comparing conditions (repeated measures), groups based on another IV (factorial), or comparing conditions (pre-post-test) while comparing groups

External Validity

- not like the validity of your measures

  - although that is important

- validity here refers to your study's design

- **external validity** is how well you can generalize your study to people, settings, times, measures, and characteristics other than those used in your study

  - using a sample of college students, how well would this generalize to adults in their 40s

- **threat to external validity** is any characteristic of a study that limits the ability to generalize study findings

External Validity

- generalization from a sample to a general population

  - Ex: sample of adults in prison for the last 30 years

- generalization from one research study to another

  - Ex: examining students at the University of Oregon and trying to compare to CSU students

- generalization from a research study to a real-world situation

  - Ex: healthy eating experiment vs eating in real-world situation

Internal Validity

- **internal validity** is established if there is a single explanation for a relationship between two variables

- **threats to internal validity** are any factors that allow for alternative explanations

- What design would probably have the best internal validity? How about the worst design?

Validity & Quality of Research Study

- be aware to threats of internal validity when creating a research study
  - experimental designs - focus on how to control for extraneous variables
  - correlational designs - focus on incorporating confounding variables to be included in analyses

Threats to External Validity

- generalizations across participants
    - **selection bias** is when there is not an equal chance of being selected, and some potential participants are being favored over others
    - college students as a sample lack generalization to outside populations
    - **volunteer bias** is when those that are most interested are those that only participate
    - participant characteristics is important because demographic information can be crucial for generalization to other studies
    - constructs like race/ethnicity, gender, sex, age, socioeconomic status, etc. help provide context for your sample
    - cross-species generalizations is when using rats or other animals to generalize to humans
    - Ex: drug trials showing benefits in rats

Threats to External Validity

- generalizing across features of study
  - **novelty effect** is when participants perceive and respond differently than in the real world
  - **multiple treatment interference** is when conducting within-subjects designs and participating in one condition carries over to the next condition
  - often accompanied by **fatigue** (tired) and **practice effects** (know what to expect)
  - experimenter characteristics are just how different are those administering the experiment

Threats to External Validity

- generalizing across features of measures
  - **sensitization** is the comparison between measuring constructs compared to real-world applications, where the construct may not be directly measured
  - **pretest sensitization** is when using a pretest causes participants to be more aware of their behaviors
  - generality across response measures is from different measures giving different findings, self-report vs physiological
  - time of measurement can be a threat, because testing right after an intervention looks different than 6 months after the intervention

Threats to Internal Validity

- **extraneous variables**

    - any variable in a study other than the specific variables being studied (IV and DV)

- **confounding variables**

    - extraneous variable that changes systematically along with IV and DV

Threats to Internal Validity

- environmental variables

  - size of the room, different room configurations, raining vs sunny days

- **participant variables** are differences between each individual in your study

  - individual differences can cause issues, primarily in experimental designs, if not using randomization

- time-related variables

  - within-subjects designs, where the amount of time between conditions can be a cause for issues with internal validity

Balancing Internal and External Validity

- needs to be a balance between external and internal validity

    - trade offs are expected

- artifacts distort measurements

- experimenter bias is when an experimenter's influence is affecting the findings of the study

    - single-blind and double-blind experiments can help mitigate this bias

- demand characteristics and reactivity can also impact your study if participants are behaving in ways outside of how they usually act

Exaggerated Variables

- while you are trying to have similar conditions on everything but the variable being manipulated, you may think about how much should you change some aspect of your manipulation

  - Book: 2 degree change in room temperature may not be enough, 20 degree change may be too much

- Ex: How long should participants have to experience the manipulation?

  - What is the average time to read a short passage?