Experimental Psychology, Arlo Clark-Foos

RESEARCH QUESTIONS
Study A

*The effects of gender and aging on pain perception.*

- Are there differences in pain threshold and pain tolerance between males and females, young and old?

- Materials: Cold-pressor, Stopwatch/Clock
- Participants: Males, Females, Young, Old

- Hypotheses: What do you think?
Study A

*The effects of gender and aging on pain perception.*

- Results:
  - Pain Threshold (detection): No differences
  - Pain Tolerance:
    - Males > Females
    - Young > Old

- Why did this occur?
Psychological Research

- Psychological research deals with all behavior of humans and animals and all of the contexts in which these occur
**Hypothesis**

- A statement that makes an assertion about what is true in a particular situation; often, a statement asserting that two or more variables are related to one another.
- **Testable!**
- Examples?

**Designing Experiments**

- Specific predictions (based on hypotheses)
- Supported or Rejected….NEVER PROVEN!
Sources of Research Ideas

- **Nonsystematic Sources**
  - Common Sense
  - *Ex. Do opposites attract?*
  - *More examples?*
Sources of Research Ideas

- Nonsystematic Sources
  - *Observation of the World Around Us*
Sources of Research Ideas

- Nonsystematic Sources
  - *Everyday Occurrences*
Sources of Research Ideas

- Nonsystematic Sources
  - Inspiration
Sources of Research Ideas

- Nonsystematic Sources
  - Serendipity
Sources of Research Ideas

- Systematic Sources
  - Past Research
    - Literature Review
    - Failures to Replicate

THROUGH THE MAGIC OF "FACILITATED COMMUNICATION", A TURKEY SPEAKS!

LOOK, HE’S SAYING "HAPPY THANKSGIVING"!!
Sources of Research Ideas

- **Systematic Sources**
  - *Theories*
    - Systematic body of ideas about a particular topic or phenomenon.
      - Organize & Explain
      - Generate New Knowledge
  - Theory ≠ Hypothesis
Sources of Research Ideas

- Systematic Sources
  - Theory
  - Ex. Social Loafing
Sources of Research Ideas

- Systematic Sources
  - Practical Problems
Evaluating a Research Question

1. Does it address a gap in the literature?
2. Is the topic interesting to you?
3. Is the question easily and fully researchable?
   - What type of information do you need?
Evaluating a Research Question

4. Is your question *too broad* or *too narrow*?

5. Is your research question testable?

6. Can you test your question in an ecologically valid manner?
Evaluating a Research Question

A. Does the Michigan bottle deposit reduce litter on the sides of city streets and highways?

B. Which soft drink is better: Coca-Cola or Pepsi?

C. Do children sent to daycare or pre-school start kindergarten with more developed skills?

D. What are the 14 U.S. states that were directly affected by the Louisiana Purchase in 1803?
Research Process

- Finding New Problem
- Literature Review
- Theoretical Concerns
- Hypothesis
- Research Plan
- Conducting Project
- Analyzing Findings
- Decisions About Findings
- Preparing the Report
- Sharing Results
Research Process

- Finding a Problem
  - Nonsystematic and Systematic Sources

- Reviewing the Literature
  - PsycInfo, PsycArticles, PubMed, etc.
Research Process

- Theoretical Considerations
  - A **theory** is a formal statement of the relation among the relevant variables in a particular research area. All good theories:
    - Attempt to organize a given body of scientific data.
    - Point the way to new research.
Research Process

- The Hypothesis
  - Attempts to state specific IV-DV relations within a selected portion of a larger, more comprehensive research area or theory.
  - The *research* or *experimental hypothesis* is the predicted outcome of a research project.
    - The research hypothesis states a testable prediction about the relations between the independent and dependent variables in your experiment.
Research Process

What are Independent and Dependent Variables?

- IV: What you plan manipulate or change
- DV: What you measure (your data)

- The effects of gender and aging on pain perception.
- IV(s): 
  - DV(s):
Research Process

- Conducting the Experiment

- Analyzing Findings
  - Lies, Damned Lies, & Statistics
Research Process

Discussion and Decisions About Findings

- Was our hypothesis supported?
- Do results agree with past research? How do they fit in?
- If our results do not fit perfectly, what changes need to be made in our interpretation or existing theory to accommodate them?
- Does lack of support for our hypothesis disconfirm the theory?

Absence of Evidence ≠ Evidence of Absence
Research Process

- Preparing the Research Report
  - APA Style
  - More on this Later

- Sharing Your Results
  - Publication, Conference Presentations
  - MPA, SEPA, Psychonomics, APS, APA, etc.
Research Process

- Finding New Problem
- Literature Review
- Theoretical Concerns
- Hypothesis
- Research Plan
- Conducting Project
- Analyzing Findings
- Decisions About Findings
- Preparing the Report
- Sharing Results

The process flows in a circular manner, indicating iterative steps in the research process.
Library Research

- Journals: Peer reviewed, high rejection rate

- PsycINFO: Search engine for psychology journals and book chapters

- (Social) Science Citation Index: Allows one to search for all articles that cited __________
  - ‘key article’
Library Research

- Literature Reviews: Articles that review a large literature on a specific topic
  - Psychological Bulletin, Psychological Review, Journal of Experimental Psychology: General, etc.

- Google Scholar (scholar.google.com)
Evaluating Web Sources

1. Is the site associated with a major educational institution or research organization?
2. Is there information on who is responsible for maintaining the website? What are their credentials?
3. Is the information current?
4. Do links on the website lead to legitimate organizations?
Anatomy of a Research Article

Abstract

- 120-250 words
- Includes information about hypothesis(es), procedure, and broad pattern of results
- Does NOT include any discussion
Anatomy of a Research Article

Introduction

- Outlines research problem and why it is important/interesting to others
- Past research/theories are described in detail
- Expectations and hypotheses are clearly stated
Anatomy of a Research Article

Method

- Varying # of subsections
- Overview of experimental design
- Participants: How many, relevant demographic information, how they were recruited
- Materials: Tests, scales, stimuli, etc.
- Apparatus: Equipment, such as radial arm maze or fMRI
- Procedure: No potentially crucial detail omitted; everything necessary to replicate.
Results

- Narrative: Description of overall effects in plain English.
- Statistical: Description of numerical and statistical differences between groups, relationships, etc.
- Graphical: Tables and Figures (graphs) may be used to further illustrate important findings.
Anatomy of a Research Article

**Discussion**

- Support or refute hypothesis(es)?
- Explanation of results (without data)
- Problems? Methodology, hypothesis, etc.
- Connection to past research
- Theoretical implications
- Practical applications
Next Class...

- Meet in Room 1212, Mardigian Library