The Science of Psychology

Module 2
Psychology's Scientific Method

Module Objectives

- Why is Psychology a Science?
- What is the scientific method?
- Why should I believe what researchers say?
- How do Psychologist's conduct research?
  - Types of research

Scientific psychology has four basic goals:

_____

behavior and mental processes

Psychology as a Science

- Psychologists must engage in _____ _____ when studying behavior and mental processes
  - Systematic observation is setting up our study so that we eliminate or _____

"We must keep our minds open but not so open that our brain falls out."

(Oberg, 1995)

Why can't scientists base their research off of casual, everyday observations?

(AKA, *People watching*)

Unfortunately, casual observation is subject to _____ that can distort information

_____
_____
_____

Skepticism combines two opposing attitudes:

- _____
_____
_____
_

Why is Research Conducted?

The purpose of scientific research is to **create** _____

- This knowledge is applied in all areas of society to provide solutions.

How Do Scientists Collect and Evaluate Evidence?

The _____ is how Psychologist's gain knowledge about the mind and behavior

Scientific Method in Psychology

- Step 1: Before research begins, a problem must be identified.
  - _____
    _____
- Phenomena that psychologists study are called a ***variables*** (anything that can change).

- The answer to such questions are called _____
  - Theories seek to _____
    _____
    _____

Make a Prediction!

- Step 2: Develop a *hypothesis*, or a _____ _____about how one factor is related to another.

The hypothesis must be testable, but also

_____

Meaning the variables are in

_____

by defining a numerical value.

Step 3- Testing through Empirical Research

It's time to design the study to test a prediction (hypothesis) that is based on a theory.

Examples of Operational Definitions

- *Aggressive behavior* – the number of times a child punches a punching bag over the course of one hour
- *Happiness* – the number of times a person smiles while watching a Disney movie
- *Intelligence* – a score on an IQ test
- *Anxiety* – the number of pencils a student brings to an exam

Was my prediction correct?

Step 4- Drawing Conclusions

- Researchers draw conclusions about the results of the study. Did the information support or oppose their hypothesis?
- Don't forget…this information MUST

Evaluating the theory

- If the information produced in a study supports the original hypothesis it is published in the scientific community in *peer-reviewed journals.*
  - The scientific community continues to debate the issue further.

Types of Psychological Research

Experimental Research
Descriptive Methods
Correlational Research
Biological Research

Descriptive Research is used to observe and record behavior

Naturalistic Observation

A systematic observation what many people do under natural conditions_____

Case Study

- An in-depth look at a single (unusual) individual.
- Case studies provide dramatic, detailed _____
  _____
  _____

Ask questions…

- *Surveys* _____
  _____
  - A survey asks people to report their _____ through a standard set of questions.
- Although these a be a great way of collecting data, they must be properly constructed.

Limitations

- People tend to answer the _____
  _____
  rather than provide how they really feel about the topic.
- Or they _____

Correlational Studies

- Research that examines the relationships between variables by making predictions.
  - _____
    _____

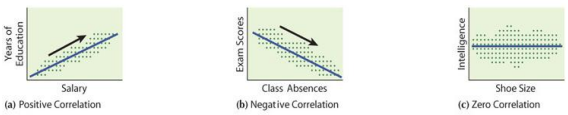
- Correlation indicates the _____ of a relationship.
  - It allows for prediction of one variable based on the other variable

The strength of the relationship is measured by a *correlation coefficient* which ranges from

_____

+1: perfect positive correlation (perfect relationship)
0: no correlation (no relationship)
-1: perfect negative correlation (perfect relationship)

A



- In a positive correlation, the two factors move (or vary) _____
  _____

- In a negative correlation, the two factors vary in _____ _ as one factor increases, the other factor decreases.

- Sometimes there _____between two variables—a zero correlation.

Name that Correlation!

- The more you party, the lower your test grade.
- The more you study, the higher your test grade
- The amount of time a college student studies and their height in inches

"Correlation is not causation!"

- Just because there is a correlation between two variables does not mean that_____ _____
- The relationship could be the result of another variable that was not studied *(third-variable problem)*

Experimental Research

This is the ONLY research design that can examine a _____ _____

Experimental Method

- A study in which the investigator manipulates at _____
  _____
  - Determines a cause and effect relationship between variables and should involve *random assignment* of participants.

Experimental Design

- *Variables* are a condition or characteristic that is subject to change.
- There are two types of variables in every study:
  - _____
    - Factor that is manipulated
  - _____
    - Behavior/variable that is measured

Variables

- Independent Variable is the variable is purposefully manipulated by the experimenter to see what changes happen.
  - _____
    _____

What will happen if…?

- *Dependent Variable* is the behavior that is measured because it is expected to change.

Identify the Variable
Independent and Dependent?

- Developmental psychologists want to know if exposing children to differing amounts of public television improves their reading skills.

Name the Variables!

- A clinical psychologist is interested in how heart rate is affected by viewing a violent film as opposed to a nonviolent film

Try another one

- Cognitive psychologists are interested in what types of diagrams are easiest for people to remember

OK, Last One…

- An industrial/organizational psychologist tests to see if wearing name tags makes employees happier with their work

Who will you study?

- Participants in a study are individuals in an experiment whose behaviors are observed.

  _____

- All have something _____ which is based on what the researcher is testing

Participants are randomly assigned to one of two groups:

1. The _____
   - This group does not receive the independent variable
   - It does not receive the treatment

2. The _____
   receives new treatment
   - This group "receives" the independent variable

Cautions about research

- *Validity* refers to the soundness of the conclusions a researcher draws from an experiment

- *External Validity-*
  - The degree to which an experiment actually reflects the real-world issues it is supposed to address

- *Internal validity-*
  - The degree to which changes in the DV are due to the manipulation if the IV

Being part of a research study can potentially lead to unintended consequences for the participants. Safeguards are required to protect participant rights.

Ethics in Research

- Participants must be advised about the purpose and conditions of the study- up front.
- Participants cannot be coerced into doing something psychologically or physically harmful, or that violates standards of decency
- At the end of the study, participants must go through *debriefing*
- Psychology has a long history of controversial that experiments that would now be considered UNETHICAL.

Next Class...

- Biopsychology
  - How is the nervous system organized?
  - How do "brain chemicals" influence our behavior?