

### Research Methods

- Play “Aliens Have Landed” (11:25) Segment #3 from Scientific American Frontiers: Video Collection for Introductory Psychology (2<sup>nd</sup> edition).
- Follow with a discussion on the unbiased scientific research.

### Scientific Method

- Technique using tools such as observation, experimentation, and statistical analysis to learn about the world
- Through its use, psychology is thereby considered a science.

### Research and Research Methodology

- Method of **asking questions** then **drawing logical supported conclusions**
- Researchers need to be able to determine if conclusions are reasonable or not (critical thinking).

### Common Sense

- Conclusions based solely on personal experience and sensible logic
- Can lead to incorrect conclusions

### Observation and Bias

### Module 2: Research Strategies

### Observation

- Gathering of information by simply watching subjects
- Can lead to bias

### Bias

- Situation in which a factor unfairly increases the likelihood of a researcher reaching a particular conclusion
- Bias should be minimized as much as possible in research

### Researcher Bias

- The tendency to notice evidence which supports one particular point of view or hypothesis
- Objectivity tends to reduce bias.

### Critical Thinking

- Thinking that does not blindly accept arguments or conclusions but questions their validity

### Participant Bias

- Tendency of research subjects to respond in certain ways because they know they are being observed
- The subjects might try to behave in ways they believe the researcher wants them to behave

- Can be reduced by naturalistic observation

#### Naturalistic Observation

- Method of observation where subjects are observed in their “natural” environment

- Subjects are not aware they are being watched

- Could use hidden cameras or two way mirrors

#### Case Studies

### Module 2: Research Strategies

#### Case Study

- In depth study of one individual with the hopes of determining universal principles

- This technique is very open to bias

- Difficulty of applying data from one person to everyone

#### Correlation

### Module 2: Research Strategies

#### Correlational Study

- Research study designed to determine the degree to which two variables are related to one another

### How to Read a Correlation

#### Positive Correlation

- As the value of one variable increases (or decreases) so does the value of the other variable.

- A perfect positive correlation is +1.0.

- The closer the correlation is to +1.0, the stronger the relationship.

#### Negative Correlation

- As the value of one variable increases, the value of the other variable decreases.

- A perfect negative correlation is -1.0.

- The closer the correlation is to -1.0, the stronger the relationship.

## Zero Correlation

- There is no relationship whatsoever between the two variables.

## Correlational Study

- Important NOT to imply a cause and effect relationship between the variables
- Correlational study does not determine **why** the two variables are related--just that they are related.
- Correlational studies are helpful in making predictions.

## Surveys

### Module 2: Research Strategies

#### Survey Method

- Research method that relies on self-reports; uses surveys, questionnaires, interviews.
- Usually a very efficient and inexpensive method

#### Population

- The total large group being studied from which a sample is drawn for a study

#### Random Sample

- A sample that represents a population fairly:
  - Each member of the population has an equal chance of being included.
  - If a sample is not random it is said to be biased.

What are the Odds of Each?

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## Longitudinal and Cross-Sectional Studies

### Module 2: Research Strategies

#### Developmental Psychologists

- Psychologists who study how individuals change throughout their lifetime

#### Longitudinal Study

- Developmental study where researchers study the same group of individuals for many years
- Can be very expensive and difficult to conduct

#### Cross-Sectional Study

- Developmental study where researchers simultaneously study a number of subjects from different age groups and then compare the results
- Cheaper, easier than longitudinal studies, but group differences may be due to factors other than development.

#### Longitudinal/Cross Sectional Study

Experiments: Hypotheses and Operational Definitions  
Module 2: Research Strategies  
Experimental Method

- Play “Water, Water Everywhere” (12:20) Segment #2 from Scientific American Frontiers: Video Collection for Introductory Psychology (2<sup>nd</sup> edition)

Hypothesis

- A testable prediction of the outcome of the experiment or research

Operational Definitions

- A specification of the exact procedures used to make a variable specific and measurable for research purposes
- In evaluating others’ research, first determine if you agree with the researchers’ operational definitions.

Experiments: Independent and Dependent Variables  
Module 2: Research Strategies  
Independent Variable

- The experimental variable which causes something to happen
- The “cause variable”
- The variable manipulated by the experimenter
- The variable which should change the dependent variable

Dependent Variable

- The experimental variable which is affected by the independent variable
- The “effect variable”
- The outcome of the experiment
- The variable being measured

Experiments: Groups, Random Assignment, and Confounding Variables  
Module 2: Research Strategies  
Experimental Group

- The subjects in an experiment who are exposed to the treatment (independent variable)
- Also called the experimental condition
- The group being studied and compared to the control group

Control Group

- Are not exposed to the independent variable
- Results are compared to those of the experimental group
- Also called the control condition

Confounding Variables

- Variables, other than the independent variable, which could inadvertently influence the dependent variable

- These variables should be controlled for in order to draw a true, cause-effect relationship in the experiment.
- Many confounding variables can be eliminated through random assignment.

#### Random Assignment

- Assigning participants to the control and experimental groups by chance
- Each participant should have an equal chance of being assigned into either group.

#### Experiments

- Play “Experimental Design” (7:24) Segment #3 from Psychology: The Human Experience

#### Experiments: Control for Other Confounding Variables

##### Module 2: Research Strategies

##### Confounding Variables:

##### Environmental Differences

- Any differences in the experiment’s conditions--between the experimental and control groups
- Differences include temperature, lighting, noise levels, distractions, etc.
- Ideally, there should be a minimum of environmental differences between the two groups.

##### Confounding Variables:

##### Expectation Effects

- Any changes in an experiment’s results due to the subject anticipating certain outcomes to the experiment

#### Blind procedure

- An experimental procedure where the research participants are ignorant (blind) to the expected outcome of the experiment
- Sometimes called single blind procedure

#### Double Blind Procedure

- An experimental procedure where both the research participants and those collecting the data are ignorant (blind) to the expected outcome of the experiment

#### Placebo

- A non-active substance or condition administered instead of a drug or active agent
- Given to the control group

#### Placebo Effect

- Play “The Placebo Effect: Mind-Body Relationship” (9:14) Segment #3 from The Mind: Psychology Teaching Modules (2<sup>nd</sup> edition)

Experiments: Data Analysis  
Module 2: Research Strategies  
Statistically Significant

- Possibility that the differences in results between the experimental and control groups could have occurred by chance is no more than 5 percent
- Must be at least 95% certain the differences between the groups is due to the independent variable

Experiments: Replication  
Module 2: Research Strategies  
Replication

- Repeating the experiment to determine if similar results are found
- If so, the research is considered reliable.

Experimental Method

- Play “Tackling a Killer Disease” (10:07) Segment #1 from Scientific American Frontiers: Video Collection for Introductory Psychology (2<sup>nd</sup> edition)

Ethics  
Module 2: Research Strategies  
Ethics:  
Human Research  
(Four Basic Principles)  
Module 2: Research Strategies  
1. Informed Consent

- Participants must be informed, in advance, about:
  - the general nature of the research, and
  - any potential risk.
  - Participants must have the right to refuse participation or withdraw at any time.

2. Right to be Protected from Harm and Discomfort

- Studies involving harm or discomfort may be conducted only under certain circumstances, and only with the informed consent of the participants.

3. Right of Confidentiality

- Individual data about research participants should never be discussed or released.

4. Right to Debriefing

- Participants have a right to receive a complete explanation of the research at the end of the study.
- This is extremely important if the research involves deception.

Ethics:  
Animal Research  
Module 2: Research Strategies  
Reasons for Animal Research

- Interest in animal behavior as a topic of study
- Data from animal studies may apply to humans.
- Easier to do some type of studies (genetics) due to the shorter life span of animals

Reasons for Animal Research

- Easier to exercise more control over experiments with animals as compared to humans
- Procedures that are not ethical to perform on humans may be considered acceptable when performed on animals

Care of Animals used in Research

- Animals used in research must:
  - Have clean housing with adequate ventilation
  - Have appropriate food
  - Be well cared for

The End  
Name of Concept

- Use this slide to add a concept to the presentation  
Name of Concept