

Research

Thinking Like a Scientist

- ▶ What makes scientific thinking different than everyday observation?
 - Objectivity rather than subjectivity
 - Systematic observation and repeatable evidence

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Developing a Research Idea

- ▶ Hypothesis
 - Proposed explanation for a situation: "if A happens then B will be the result"
- ▶ Theory
 - A set of facts and relationships between facts that can explain and predict related phenomena

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The Scientific Method

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Observable behavior

child with ADHD has a problem sitting for long periods of time

Formulate a research ?

what strategy(s) could a teacher implement that could reduce student distraction

Formulate hypothesis

have various seating options including a ball and standing desk

test/collect/analyze data

give the student alternative seating
have a person record amount of "off task" behavior

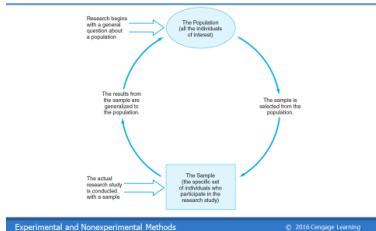
Draw conclusions/refine

yes/no to change in behavior

Research

samples- small group to study
must represent wide variety of population.

Selecting Participants for a Research Study



Biased sample

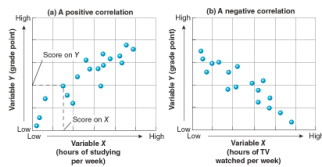
sample doesn't represent entire population
avoiding biased sample
random sampling
Stratified samples
sample size

Types of research

Correlation

Designing a Correlational Study

- ▶ Measure the direction and strength of the relationship between two variables, or factors



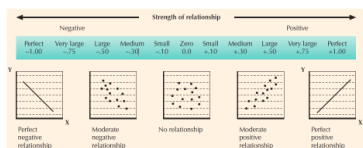
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Positive correlation - high value for one variable corresponds to high value of another

Negative correlation - high value for one variable corresponds to Low value of another

Measuring the Correlation

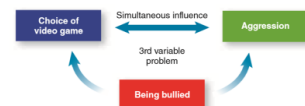
- ▶ The correlation coefficient



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Understanding Causation

- ▶ The third variable problem



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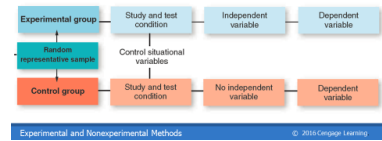
Experiment

Independent variable (IV) - variable the experimenter deliberately controls

Dependant variable (DV) - variable being measured

Designing an Experimental Study

- ▶ Manipulate one variable and observe changes in others
 - Independent variable: the cause
 - Dependent variable(s): the effect



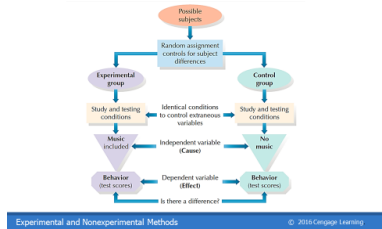
Assigning Participant Groups in a Study

- ▶ Randomly assign participants to:
 - Experimental groups, who experience the independent variable
 - Control groups, who do NOT experience the independent variable



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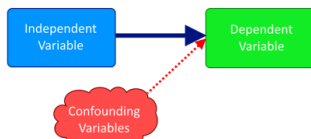
An example experiment: Does Listening to Music While Studying Affect Learning?



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Problems in Experimental Research

- ▶ Confounding (extraneous) variables
- ▶ Experimenter bias



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Naturalistic Observation

observing human/animals in natural setting

ad. - accurate behavior

dis - hard to be in natural setting

Nonexperimental Methods: Naturalistic Observation

- ▶ Jane Goodall observing the world of the chimpanzee



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Case study

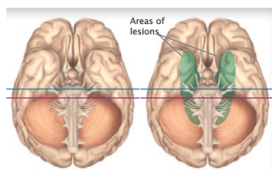
intense study of an individual or small group over a period of time

ad. - looks at individual problems

dis. - sample size too small

Nonexperimental Methods: Case Studies

- ▶ Analyzing the case of H.M.



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Survey

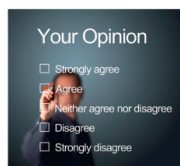
practical way to gather data on beliefs, attitudes, actions of a large group

ad - eliminates research bias

dis - subjects could lie

Nonexperimental Methods: Surveys

- ▶ Polling a large population



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Longitudinal Study

Study the same group of subjects over a long period of time

ad. - consistent/inconsistent behavior

dis - time consuming/subject could leave

Cross-cultural study

comparison of people's beliefs, values, behaviors from different cultures

Conducting Ethical Research

American Psychological Association Guidelines

- Do no harm.
- Accurately describe risks to potential participants.
- Ensure that participation is voluntary.
- Minimize discomfort to participants.
- Maintain confidentiality.
- Do not unnecessarily invade privacy.
- Use deception only when absolutely necessary.
- Provide debriefing to all participants.
- Provide results and interpretations to participants.
- Treat participants with dignity and respect.
- Allow participants to withdraw at any time for any reason.

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Ethically Questionable Research: The Tuskegee Syphilis Experiments

- ▶ Prisoners, soldiers, and mental patients were deliberately exposed to syphilis and gonorrhea to test the effectiveness of penicillin



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Conducting Animal Research

- ▶ Can be controversial
- ▶ APA guidelines for what kind of research is permissible



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