Research Methods in Psychology

**Descriptive Methods**
- Naturalistic observation
- Intensive individual case study
- Surveys/questionnaires/interviews
- Correlational studies

**Naturalistic Observations by Jane Goodall**
- Observing behavior in its natural setting hopefully without affecting the behavior

**Case Study**
- Intensive study of an individual

*Case studies: Can provide in-depth data on an individual and spark ideas for further research*
- **BUT** we can’t assume it will apply to all others with the same condition
- **“You Are Responsible for covering testimonials, error & bias, self–fulfilling prophecy on p. 31; placebo effects on p.32**

**Survey**
- Using questionnaires or interviews to efficiently collect data from many people
- But data may not be useful if questions are poorly written or administered, if sample of participants is not representative, or if responses are not accurate because of:
  - Social desirability bias (want to look good)
  - Demand characteristics of the research (want to help researcher)
  - Poor memory or awareness of one’s behavior

**Attention Deficit/Hyperactivity Disorder (ADHD)** based on new DSM5
- Diagnosed when a child* shows
  - 6 or more symptoms of inattention and/or
  - 6 or more symptoms of hyperactivity and/or impulsivity
  - These symptoms must have been present for at least 6 months & must be inappropriate for their developmental level.
- Do you know someone with ADHD?
  - *Over age of 17: 5 or more symps, disruptive to functioning, some of which were present before 12

**Naturalistic Observations in the Classroom**
- Compared to the average kid, those with ADHD have trouble:
  - staying in their seats or sitting still,
  - paying attention, following instructions
  - completing work, staying on task
  - controlling impulses, controlling temper
- This method makes use of real-life situations, but it is important to use well-trained, unbiased observers.
Survey Results Reveal:

- 5x more males than females
- 3-5% of USA school kids are taking medication for ADHD
- 50-60% show defiant behavior & higher risk of conduct problems as teens
- 30-60% still have symptoms as adults
- 40% have a parent with symptoms

Correlation

- Correlation: the degree to which one variable or set of data is related to another variable or set of data.
- Correlation coefficient: statistical calculation indicating the strength and direction of this relationship.
  - Varies between -1 (perfect inverse or negative correlation) and +1 (perfect positive correlation)
  - Correlations help us predict behavior but do not indicate the cause of the relationship.
  - Remember: Correlation does not prove causation.

The Direction of the Correlation (positive or negative)

Strength of a Correlation

- How spread out the dots are around the line
- Stronger \( \rightarrow \) Weaker

Moderate (Positive) Correlation
Negative Correlation

- Even though there is a positive correlation between ACT scores and grades in college, we cannot conclude that ACT scores CAUSE you to have particular grades or that grades cause you to have a certain ACT score.
- Often an unmeasured variable or variables (intelligence, reading ability, quality of your HS education) is the reason behind the correlation relationship we see.
- Sometimes called “the 3rd variable problem”

Correlations

- The larger the correlation coefficient, the stronger and more predictive the relationship between the data sets.
- A strong negative correlation is just as predictive as a strong positive correlation.

The “Third Variable” Problem

Ice cream sales and violent crime are positively correlated, which is a classic example of the “third variable problem.”

Is Hyperactivity Correlated in Twins?

- Male fraternal twins show almost no correlation (+.05) in their level of activity.
- But male identical twins show a strong correlation (+.71) in their level of activity.
- Supports the hypothesis that genetics play a role in ADHD, but does not prove a cause-effect relationship.
Research Methods in Psychology

- Descriptive Methods
  - Intensive individual case study
  - Naturalistic observation
  - Surveys/questionnaires/interviews
  - Correlational studies

- The Experimental Method
  - for determining cause-effect relationships

Why is an experiment different?

- Tests hypothesis by comparing the behavior of 2 or more groups of participants under very controlled conditions.
- Groups are treated as similarly as possible EXCEPT for the critical variable (the independent variable) that the researcher is interested in.
- The researcher intentionally manipulates or varies the independent variable to study its impact on behavior, while keeping everything else constant.

Hypothesis

- A testable statement or prediction about the relationship between 2 or more variables
- Examples:
  - Consumption of alcohol will impair short-term memory.
  - Relaxation training will reduce test anxiety and improve test performance.
  - Watching a violent video will increase violent behavior.

Definitions:

- Independent variable - what the investigator manipulates or varies; the thing that is different in the experimental group versus the control group.
- Dependent variable - the behavior that is observed, measured, tested; the actual data collected from both groups.
- The researcher must define both the independent & dependent variables as they will be used in his/her study: These are "operational definitions"
The groups:

- **Experimental group** – the participants exposed to the independent variable that the researcher is really interested in.
- **Control group** – the participants NOT exposed to the independent variable of interest but rather to some substitute control condition.

Random Assignment of participants to the two groups

- To make the 2 groups as equal as possible, most often participants will be *randomly assigned* to 1 group or the other. This assures that there are no systematic differences between the groups.

Why are experiments different?

- If everything is kept constant except for the independent variable, then any differences in performance between groups should be caused by the independent variable.
- In other words, the experiment tests whether the independent variable causes changes in the dependent variable (behavior).

Extraneous Variables

- Any other variables besides the independent variable that seem likely to influence the dependent variable in a particular study.
- Every effort must be made to assure that the experimental and control groups do not differ with respect to these extraneous variables.

- Hypothesis: Damage to the hypothalamus will cause a change in eating behavior.
  - IV?
  - DV?
  - Exp. Group?
  - Control Group?
Research on Multi-tasking

• Humans are NOT good at it
• Not truly able to pay attention to 2 complex tasks at once – must switch attention back and forth, missing info
• We’ve all heard about the dangers of texting while driving, but it need not be a MANUAL task to disrupt attention and behavior.

Using Experiments to Put Hypotheses to the Scientific Test – Examples Shown in Class

• A Creativity Study
• A Police Interview Study
• Some Cell Phone Studies
• An Eye-Gaze Study

• Important research by Dr. David Strayer
• Studied the effect of hands-free cell phone use on driving behaviors
• Used high quality driving simulator with Ford Crown Vic dashboard and controls
• Hypothesis 1: talking on cell phone will impair driving more than talking to passenger during 24 mile “drive” to specific location
• This experiment used 3 groups:
  • Talk on cell; talk to passenger; alone/no cell
  • http://www.psych.utah.edu/psych4130/cellphone.wmv

Lane Keeping Errors

![Lane Keeping Errors Chart]

Successful Navigation

![Successful Navigation Chart]
How Significant is the Interference?

- Cell-phone vs. drunk-driver

- Hypothesis 2 – talking on cell will impair driving as much or more than driving intoxicated

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### Reaction Time When Braking

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<th>Reaction Time</th>
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<th>Cell-Phone Driving</th>
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### Rear-end Collisions

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<th>Intoxicated Driving</th>
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Double Blind Procedure

- Always keep a skeptical eye
- Did that experimental research follow good, carefully controlled procedures?
- How might that market researcher influence the research results to favor the company paying the bill?

- Neither the participants nor the experimenter/data collector knows which product is which until after the data is collected.
- Avoids participant bias
- Avoids experimenter bias
- Recognizes “placebo responses”

- Similarly, maintain a skeptical eye when hearing survey/questionnaire results
- Was the population sample appropriate and of adequate size?
- Were the questions worded carefully to avoid biasing participants responses?
• Ideal: random selection or “random sample” of the population of interest
• But sometimes this is not feasible for practical reasons and thus the conclusions able to be drawn from that research are more limited.

Swinging Bridge Study

• http://www.youtube.com/watch?v=P0aMEkGlQE&list=UU943UnajVwe95fJ3pwLsQ&index=11
• IV?
• DV?
• Experimental group?

Clark & Hatfield – studied 48 Male and 48 Female FSU students

• On one of the busy campus quads an attractive research assistant would approach a student of the opposite sex.
• The responses of males and females asked 1 of 3 possible questions were compared.
• Question 1: Will you go out with me tonight?
• Question 2: Will you come to my apartment tonight?
• Question 3: Will you go to bed with me tonight?

Clark & Hatfield – Replicated the study with another 96 students 4 years later

<table>
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<tr>
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<th>Bed?</th>
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<td>50% yes</td>
<td>60% yes</td>
</tr>
<tr>
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<td>50% yes</td>
<td>0% yes</td>
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Repeating a previous study is important in science. Will the previous results be confirmed?

Clark & Hatfield – studied 48 Male and 48 Female FSU students

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The Hatfield Example - “Experiments” That Are Not Quite True Experiments: Quasiexperiments

• Sometimes we need to use pre-existing groups in research (e.g., males vs females, alcoholics vs non-alcoholics). Since we can’t randomly assign participants to groups, there may be other differences between the groups that impair our ability to draw conclusions.