

Unit 2 Notes

Research Methods: Thinking Critically with Psychological Science

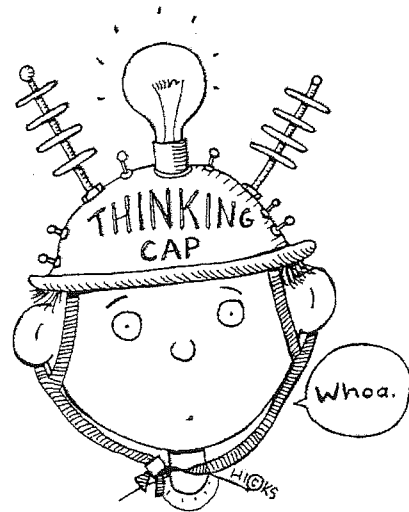
Myers Psychology for AP Textbook (p.18-49)

Terms and Concepts:

- hindsight bias
- critical thinking
- theory
- hypothesis
- operational definition
- replication
- case study
- survey
- false consensus effect
- population
- random sample
- naturalistic observation
- correlational coefficient
- scatterplot
- illusory correlation
- experiment
- double-blind procedure
- placebo effect
- experimental condition
- control condition
- random assignment
- independent variable
- dependent variable
- mode
- mean

Topics Covered:

1. The Need for Psychological Science
 - a. The limits of intuition & common sense
 - b. The scientific attitude & the scientific method
2. Description
 - a. The Case Study
 - b. The Survey
 - c. Naturalistic Observation
3. Correlation
 - a. Correlation and Causation
 - b. Illusory Correlations
 - c. Perceiving Order in Random Events
4. Experimentation
 - a. Evaluating Therapies
5. Statistical Reasoning
 - a. Describing data, measures of central tendency, measures of variation, and making inferences.



A) The Need for Psychological Science

Why do we need psychology?

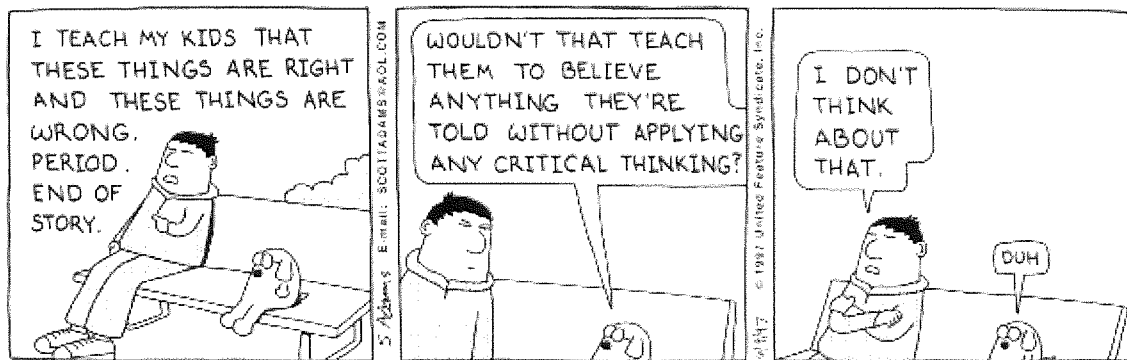
- As we familiarize ourselves with psychological science's strategies and incorporate its underlying principles into our daily thinking, our thinking becomes smarter. Two phenomenon illustrate why we cannot just rely solely on intuition and common sense when making decisions and conclusions:

- 1) HINDSIGHT BIAS- the tendency to believe, after learning an outcome, that one would have foreseen it. Also known as the '*I-knew-it-all-along phenomenon.*'
(ie: after Sept 11th, it was **OBVIOUS** that the American Intelligence should have taken advance warnings more seriously.)
- 2) JUDGEMENTAL OVERCONFIDENCE- we think we know more than we do. Humans tend to be more confident than correct.
(ie: Anagrams and confidence in unscrambling them) ☺

B) The Scientific Attitude

Underlying all science is, first, and hard-headed curiosity, a passion to explore, and understand without misleading or being misled. Some questions (ie: is there life after death?) are beyond science. To answer them in any way requires a leap of faith. With many other ideas, the proof is in the pudding. No matter how sensible or crazy sounding an idea, the hard-headed question is, "Does it work? When put to the test, can its predictions be confirmed?"

- The Scientific attitude and approach prepares us to think smarter. Smart thinking, called **CRITICAL THINKING**, examines assumptions, discerns hidden values, evaluates evidence, and assesses conclusions.



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c) The Scientific Method

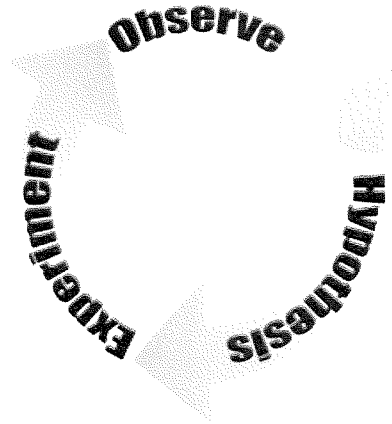
Psychologists arm their scientific attitude with the Scientific Method:

- 1) They make observations
- 2) Form Theories
- 3) Then refine their theories in the light of new observations

In everyday conversation, we tend to use 'theory' to mean "a mere hunch". In science, **THEORY** is linked with observation.

A **Scientific Theory** *explains* through an integrated set of principles that *organizes* and *predicts* behaviours or events.

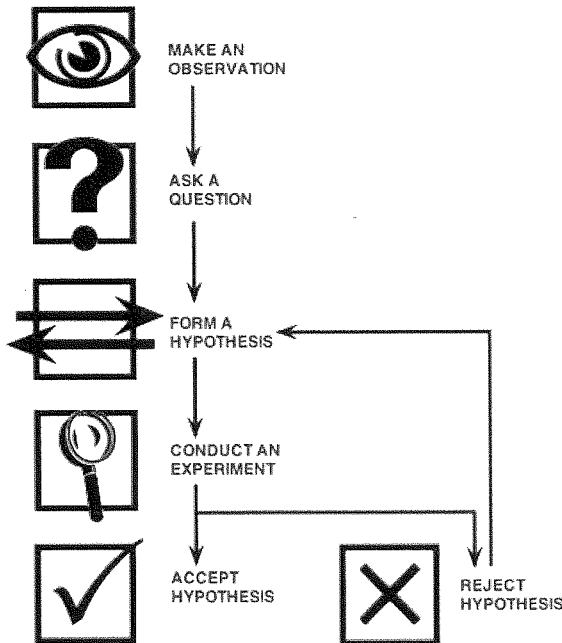
A good theory must imply *testable predictions* called **HYPOTHESES**. (what do you predict will be the results?)



The hypotheses are then tested to validate and refine the theory and to suggest practical applications.

In the end, the theory will be useful if it:

- 1) effectively organizes a range of self reports and observations
- 2) implies clear predictions that anyone can use to check the theory and repeat it.
- 3) Lead to a revised theory that better organizes and predicts your original ideas and questions.

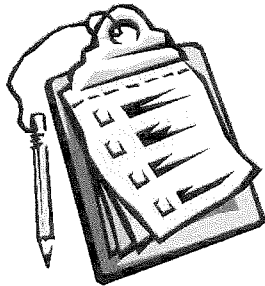


GOOD THEORIES EXPLAIN BY:

- 1) organizing and linking observed facts
- 2) implying hypotheses that offer testable predictions and, sometimes, practical applications.

THREE DIFFERENT RESEARCH METHODS:

1) **DESCRIPTIVE**- drawing conclusions about why people behave the way they do by using three main methods:



1. **THE CASE STUDY**- an observation technique in which one person is studied in depth in the hope of revealing universal principles.
2. **THE SURVEY**- a technique for ascertaining the self-reported attitudes or behaviours of people, usually by questioning a representative, random sample of them.
3. **NATURALISTIC OBSERVATION** (aka: Spying ☺)- watching and recording the behaviour of animals and humans in their natural environment without them knowing they are being observed.

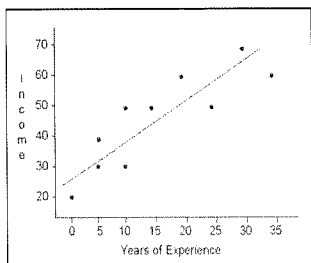


**** BUT WHAT ARE THE CRITICISMS OF EACH?**

- how many people are being observed?
- How does the wording effect surveys?
- Do people answer truthfully all the time?
- Sampling? Who are you asking or directing questions toward?
- Can naturalistic observation explain behaviour? Or just describe it?

2) **CORRELATION**- Psychologists use numbers to describe the strength of a relationship expressed as a correlation.

- Describing behaviour is the first step towards predicting it. When surveys and naturalistic observations reveal that one trait or behaviour accompanies another, we say the two *correlate*.
- The **Correlational Coefficient** is a statistical measure of relationship and reveals how closely two things vary together and thus how well either one *predicts* the other.
- Psychologists use **Scatterplots** to graph the correlation of between two variables.

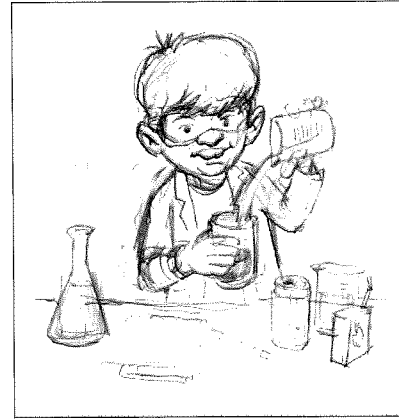


- Correlation and Causation
- Illusory Correlation - perception of a relationship where one does not exist.
- Perceiving Order in Random events (deck of cards)
- See Experiment (Basketball and the Stock Market)

3) EXPERIMENTATION

- TERMS TO KNOW FOR EXPERIMENTATION:

- a. experiment
- b. double-blind procedure
- c. placebo effect
- d. experimental condition
- e. control condition
- f. random assignment
- g. independent variable
- h. dependent variable



- To discover cause-and-effect relationships, psychologists conduct experiments. By constructing a controlled reality, experimenters can manipulate one or more factors and discover how these independent variables affect a particular behaviour, the dependent variable.

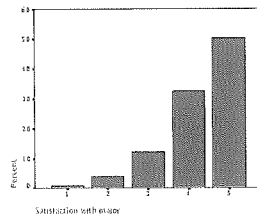
Evaluating Experiments:

- In many experiments, control is achieved by randomly assigning people either to the experimental condition (the group exposed to the treatment) or to a control condition (a group that experiences no treatment or a different version-ie; placebo).

D) STATISTICAL REASONING:

- Once a psychologist has gathered that data through the experiments and research, they have to organize, summarize, and make inferences from it, using statistics.

- Describing Data- organize it using a bar graph
- Measures of Central Tendency (mean, mode, median, range)
- Measures of Variation (standard deviation)
- Making Inferences- When is an observed difference reliable? Statistical Significance?



CRITICISMS? FAQ'S?