Using the Scientific Method in Psychology
Experimental Psychology
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The Scientific Method

1. Ask a question
2. Do background research
3. Construct a hypothesis
4. Test your hypothesis by doing an experiment
5. Analyze your data and draw a conclusion
6. Report your results (Was your hypothesis correct?)
Scientific Method

- Objective measurement
- Replication
- Self-correction
- Control
  - Cause & Effect
Objective Measurement

- Instrumentation
- Empiricism
Replication

- with Extension
- Confirmation
- Mozart effect
Self-Correction

- Public Scrutiny
- e.g., Intelligence
Control

- Factor of Interest
- Extraneous Variables (Influences)
Independent Variable(s)

- Directly Manipulated
- Levels
- Cause
  - Historical Variables
Dependent Variable

- Data (datum)
- Effect
Extraneous Variables

- Oops
- Impact on Interpretation of Data
Establishing Cause-Effect

To the extent that extraneous variables are controlled, the relation between the IV and the DV is perceived and cause and effect can be inferred.

Extraneous Variable Controls
1. Random assignment of participants to groups.
2. An attorney assisted in the preparation of the excerpts.
3. All participants answered all questions independently.

Independent Variable Manipulation
(DNA evidence vs. eyewitness testimony)

The experimenter seeks to establish a cause-and-effect relation between the IV and the DV.

Dependent Variable Measurement
(Jurors' verdict)
Types of Reasoning

- **Induction**
  - Observations → Theories
- **Deduction**
  - Theories → Observations

Bystander effect

1. Several separate experiments (A, B, C, D) are conducted.
2. The collective results of these experiments are used to formulate a theory. (Inductive Reasoning)
3. Based on the theory, additional experiments (E, F, G) are conducted. (Deductive Reasoning)
4. The results of these experiments result in a modification of the theory. (Inductive Reasoning)
5. Further experiments (H, I, J) are suggested by the modified theory. (Deductive Reasoning)
Hypotheses

- Directional vs. Nondirectional