Conducting research

- Empirical evidence
- Define the problem.
- Operationalize
- Hypothesis.
Experimental Designs

• Cause and effect.
• Hold conditions constant/manipulate (change) the independent variable.
Independent/Dependent Variable

- **Independent Variable (IV)**
  Altered by the experimenter.
- Hypothesized to cause behavior.
- **Dependent variable (DV):**
  condition affected by the independent variable.
Experimental Designs—Cont’d

• Placebo
• Random assignment of subjects to groups.
• Double blind conditions
• Extraneous variables
Descriptive Research Methods

• Observation (Naturalistic or Lab methods)
• Case study
Famous “Case Study”
Some of the earliest information on the effects of damage to frontal areas of the brain came from a case study of the accidental injury of Phineas Gage.
Observation

- **Naturalistic**: Outside a laboratory in the “real world”
- Observe behavior as it naturally occurs.
- Strengths?
- Limits?
- **Laboratory based** observational studies.
Harlow’s Monkeys (Observation in the Lab)
Predictive methods

- Designs based on Correlation
- *Statistical* relationship between two events, measures, or variables.
Correlation-Key points

• Correlation Coefficient: Ranges from -1.00 to +1.00.
• Size and the direction used to make predictions.
• Direction (Positive or Negative)
Positive correlation

- Increases in one measure predict increases in the other measure.
Negative Correlation

• **Negative correlation:**
  Increases in one measure predict decreases in the other measure.
Correlation

High positive correlation

+1.00 perfect positive
as one event increases, the second exactly increases

+.50 positive
as one event increases, the second sometimes increases

0 zero correlation
no relationship between the events

-.50 negative
as one event increases, the second sometimes decreases

-1.00 perfect negative
as one event increases, the second exactly decreases

High negative correlation
Figure 2.5  Effects of interference on memory. A graph of the approximate relationship between percentage recalled and number of different word lists memorized. (Adapted from Underwood, 1957.)

Figure 2.6  The relationship between years of college completed and personal income (hypothetical data).

Figure 2.7  The relationship between air temperature and amount of coffee consumed (hypothetical data).
Advantages/Disadvantages

• Allows for prediction.
• Ethical considerations
• Little or no control
• Cannot identify cause and effect relationships.
Ethical Principles in Research

- Ethical Guidelines
- Institutional Review Board (IRB)
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<thead>
<tr>
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<th>Basic Ethical Guidelines for Psychological Researchers</th>
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<tbody>
<tr>
<td>1</td>
<td>Do no harm.</td>
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<tr>
<td>2</td>
<td>Accurately describe risks to potential subjects.</td>
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<td>3</td>
<td>Ensure that participation is voluntary.</td>
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<td>4</td>
<td>Minimize any discomfort to participants.</td>
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<td>5</td>
<td>Maintain confidentiality.</td>
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<td>6</td>
<td>Do not unnecessarily invade privacy.</td>
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<td>7</td>
<td>Use deception only when absolutely necessary.</td>
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<td>8</td>
<td>Remove any misconceptions caused by deception (debrief).</td>
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<td>9</td>
<td>Provide results and interpretations to participants.</td>
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<tr>
<td>10</td>
<td>Treat participants with dignity and respect.</td>
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