Four Major Goals of Research in Psychology

**Describe**
To describe thoughts, feelings and behavior

**Explain**
To explain why thoughts, feelings and behaviors occur.

**Predict**
To predict implications of thoughts, feelings and behaviors.

**Control/Change**
To modify or change to improve behaviors to better the lives of individuals and society as a whole.

What kinds of research?

- Basic Research
  - Memory
  - Development
  - Language
  - Group decision making
  - Social Relationships
  - Epidemiology of behavior (violence, sexual behavior, prevalence of disorders)
  - Etc.,

- Applied Research
  - Assessment tools
  - Interventions (e.g., parenting programs, attachment disorders)
  - Applications to social policy issues (e.g., foster care, assessment of competence for juveniles, custody decisions, educational programs)

Stanford SPARQ
Stanford SPARQ is a Psychology Department “do tank” whose mission is to create and share social psychological insights with people working to improve society.

Behavioral Science & Policy Association

Shaikh works with is creating fonts for use in US and less industrialized nations including other countries.
Steps in the Research Process

1. Find a Research Idea
   Identify a general topic that you would like to explore and review the background literature to find a new idea for a research study. Use theory to generate ideas.

2. Convert the Idea into a Hypothesis
   Use your idea to generate a specific, testable hypothesis.

3. Define and Measure Variable
   Identify the specific procedures that will be used to define and measure all variables. Plan to evaluate the validity and reliability of your measurement procedure.

4. Select a Research Strategy
   Consider the relative importance of internal and external validity, and decide among an experimental (cause-effect), descriptive, correlational or quasi-experimental strategy.

5. Identify Participants or Subjects
   Decide how many participants or subjects you will need and what characteristics they should have. Also plan for ethical treatment.

6. Conduct the Study
   Collect the data.

7. Evaluate the Data
   Use the appropriate descriptive and inferential statistics to summarize and interpret the results.

8. Report the Results
   Use the established guidelines for format and style to prepare an accurate and honest report that also protects the anonymity and confidentiality of the participants (Gravetter & Forzano, 2003).

Developing a question?
The Nature of a Theory

- Set of logically consistent statements about some behavioral phenomenon

- Organize and Explain
  - (a) summarizes existing empirical knowledge
  - (b) organizes this knowledge in the form of precise statements of relations among variables (i.e., laws)
  - (c) provides an explanation
  - (d) Basis for making predictions

- Basis for making new knowledge

- Can be modified by new research
How facts become theories

Event 1
Event 2
Event 3
Event 4
Event 5
Event 6
Event 7
Event 8

Relationships form a law

Relationship form a law

Theory formed that explain laws

Predictions from theory form hypotheses

How facts become theories-continued

Predictions from theory form hypotheses

Theory Modified and New hypothesis formed

Confidence in Theory is Increased

Prediction confirmed

RESEARCH

Prediction not confirmed

Confidence in Theory is Reduced

Theory rejected

Theories of Relationships

- Social Exchange Theory
- Behavioral Theory
- Attachment
Bowlby: Preserving Freud’s Insights

- Every thought, behavior, emotion has meaning.
- This meaning comes from past or present significant experience.
- The meaning of an experience or reaction or decision is often hidden from the person.
- Central idea is the unconscious.

Preserving Freud’s Insights
John Bowlby

- Infants have complex emotional, social and cognitive lives
- Prototype hypothesis - similarities in the nature of close relationships in infancy and adulthood
- Importance of early experience

- Monkeys separated from mothers at 6 to 12 hours after birth
- Raised by surrogate mothers
- Video
What Harlow found:

- Monkeys spent greater amount of time clinging to cloth mother than wire mother "feeding" mother.
- The most important features of a mother was WARMTH and AFFECTION rather than nourishment and (warmth)
- Need for warmth and affection goes deeper than a need for nourishment

Harlow’s contributions

- Importance of mother/child bonding. Not only does the child look to his/her mother for basic needs such as food, safety, and warmth, but he also needs to feel love, acceptance, and affection from the caregiver.
- Showed some long-term psychological physical effects of delinquent or inadequate attentiveness to child needs.

Attachment theory

John Bowlby

- The goal of the attachment system is to promote safety (& feelings of security) across the lifespan through a secure base relationship with an attachment figure
- Attachment figures are a few key individuals in life, e.g., parents and partners
- The attachment system serves as a balance to exploration: optimizing both mastery and safety
Components of the attachment system

- Behavior
  - The secure base phenomenon
- Emotion
  - Triggers activation of the system
  - Associated with quality of attachment
- Cognition
  - Script or representation associated with behavior/emotion pattern

Development of attachment representations

- Secure base behaviors become automatic
- Expectations lead to the development of scripts or cognitive representations
- Cognitive representations are a framework or filter for understanding attachment experiences
- Representations are a guide for behavior in attachment-relevant situations

What does Attachment Behavior look like?
The Secure Base Phenomenon
Evaluating Theories

- Parsimony
- Precision
- Testability

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   Use your idea to generate a specific, testable hypothesis. (Gravetter & Forzano, 2003)

Hypotheses

- Statement describing relationship between or among variables.
- Must be testable
  - Positive
  - Not circular
  - Adequately defined
Hypotheses

• Testable
  • There is a relationship between intelligence and creativity

• Untestable
  • There is no relationship between age and memory ability

Hypotheses

• Testable
  • There is a difference between the social skills of 4 year old girls and those of 4 year old boys

• Untestable
  • There is no difference between social problem solving of female and male college students

Hypotheses

• Testable
  • The play therapy will decrease depression in elementary school children.

• Untestable
  • The curriculum will have no effect on the self-esteem of children
Untestable Hypotheses

- The more sins a person commits, the less likely he or she is to get into heaven.
- If people could fly, there would be substantially fewer cases of depression.

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3. **Define and Measure Variable**
   Identify the specific procedures that will be used to define and measure all variables.

**Independent & Dependent Variables**

- **Independent/Predictor**
  - Manipulated variables (levels, conditions, groups, treatment groups)
  - Subject: Individual Difference Variable (age, gender, socio-economic status)

- **Dependent/ Criterion**
  - Measured/Continuous
  - Behavior/outcome: Measured to assess changes; Measured on all participants

**Experimental Design**

- Natural Groups Design
- Correlational Design

**Correlational**
Independent & Dependent variables

- **Independent**: manipulated in an experiment; measured (continuous) variable in a correlational design; identified by researcher
  - Effects of computer simulation on high school problem solving
  - Timing of eyewitness testimony and case strength on trial verdict

- **Dependent/Criterion/outcome**: differs as function of IV. In correlational design often referred to as criterion variable
  - The influence of mothers’ smoking on adolescent behavior problems.
  - Effects of neighborhood on educational outcomes

Operational Definitions

- IVs and DVs need to be defined in term of how they are to be measured and/or manipulated.
- Different definitions lead to different procedures=diffrent studies
- Based on theoretical orientation
Examples of Operational Definitions

<table>
<thead>
<tr>
<th>Variable</th>
<th>Operational Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>A physiological measure (heart rate)</td>
</tr>
<tr>
<td></td>
<td>A self-report of anxiety level</td>
</tr>
<tr>
<td></td>
<td>Behavioral observation of avoidance behavior</td>
</tr>
<tr>
<td>Marital Quality</td>
<td><strong>Self-reported Satisfaction</strong></td>
</tr>
<tr>
<td></td>
<td>Self-report Discord</td>
</tr>
<tr>
<td></td>
<td>Observed Behavior (conflict behavior, attachment behaviors)</td>
</tr>
</tbody>
</table>

Construct validity:

Accuracy of measurement of an operational definition.

- Does it reflect reality and measure what it claims?

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Two basic research designs

• Correlational
• Experimental

Implications for Internal Validity and External Validity

**Internal validity**: Ability to make conclusions about causal relationships

Strong internal validity requires:
• Temporal precedence
• Covariation between the two variables
• Elimination of plausible alternative explanations including Third Variable and/or Confounds

**External validity** is the extent to which a study’s results can be generalized to other situations.

Correlational Designs

**Correlational Designs (Nonexperimental method)**: Observes naturally occurring variables of interest to find out if they vary together (IV is subject or Continuous)

Correlation (or covariance): Two variables that vary, or change, together
Correlational Design

Participants

Measure of Recent Life Stress

Measure Blood Pressure

Correlate the two variables

Relationships between Variables:

Four common relationships are found between variables with numeric properties.

**Positive linear relationship**
- Increases in one variable result in increases in another

**Negative linear relationship**
- Increases in one variable result in decreases in another

**Curvilinear relationship**
- Increases in one variable result in systematic increases and decreases in another
- Includes U-shaped and inverted U-shaped curves

**No relationship**
- Flat-line graph

**Correlation coefficient:** Numerical index of the strength of relationship between variables

Detection of relationships between variables reduces uncertainty by increasing understanding of the variables.
### Four Types of Relationships between Variables

1. **Positive Linear Relationship**
   - As speech rate increases, so does attitude change.
2. **Negative Linear Relationship**
   - As group size increases, amount of noise decreases.
3. **Curvilinear Relationship**
   - Liking of visual stimulus is highest when the stimulus is moderately complex.
4. **No Relationship**
   - Amount of crowding is not related to performance level.

### Two major problems with the correlational design (i.e., nonexperimental method)

- Difficult to tell the direction of cause and effect, which variable causes the other.
- Third-variable problem: Possibility that one or more extraneous variables (or confounding variables) are actually responsible for an observed covariance.

### Experimental Methods

**Experimental method:** Involves direct manipulation and control of variables

- Independent and dependent variables
- Experimental control: Extraneous variables kept constant
- Randomization: Eliminates the influence of difficult to control extraneous variables by ensuring their chances of affecting each experimental group is equal
Experimental Design

- Participants in Stress Group
  - Give a speech on statistics
  - Blood pressure measured
- Participants in No Stress Group
  - Sit quietly
  - Blood pressure measured

Compare the blood pressure of the two groups

Experimental Methods

**Internal validity**: Ability to make conclusions about causal relationships

Strong internal validity requires:
- Temporal precedence
- Covariation between the two variables
- Elimination of plausible alternative explanations

Experimental Methods: Additional Considerations

**External validity** is the extent to which a study's results can be generalized to other situations.
- The artificiality of laboratory experiments can limit their external validity.

**Field experiments** are experiments conducted in a natural setting.
- They are more realistic but offer less control.

Ethical and practical considerations limit what variables can be manipulated.
- **Participant variables** are characteristics of individuals that cannot be manipulated, such as age.
Additional Considerations

Some questions cannot be answered through experiments.

- Research with the goal of describing behaviors falls into this category.

Successful predictions of future behavior can often be made without studying cause and effect.

Using multiple methods of studying a phenomenon, both experimental and nonexperimental, yields a better understanding of it.

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*Explain*
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*Predict*
To predict implications of these thoughts, feelings and behaviors.

*Control*
To modify or change to improve behaviors to better the lives of individuals and society as a whole.

Describing Behavior: Infant Attachment Classifications

- Ainsworth was able to identify three distinct patterns of attachment:

  **Securely attached (B) 60-65%:** These infants protest or cry on separation from their mother, but when she returns, they greet her with pleasure. They are relatively easy to console, generally want to be picked up and held tightly.

  **Insecure/Avoidant (A) 20-25%:** These infants appear independent; they explore the new environment without using their mothers as a base, and they do not turn around to be certain of their mother’s presence. They do not seem affected when the mother leaves. When the mother returns, the infant avoids her.

  **Insecure/Ambivalent (C) 10%:** These infants tend to be clingy and afraid to explore the room on their own even when their mothers are present. They become very anxious during separation, often crying intensely. When mothers return, infants seek contact but simultaneously arch away from her and resist being soothed.
Outcomes of Early Attachment Experiences

Predict
To predict implications of thoughts, feelings and behaviors.

Why Early Attachment Experiences

Explain
To explain why these thoughts, feelings and behaviors occur.

Change: Improve Attachment relationships

Control/Change
To modify or change to improve behaviors to better the lives of individuals and society as a whole.
Science in Context

• Social and Cultural Context
  • Scientists’ questions, resources, and acceptance are influenced by the current zeitgeist — the social and cultural spirit of the times.
  • Because scientists conduct psychological research in a social and cultural context, they are susceptible to the potential bias of ethnocentrism.

• Ethnocentrism
  • A bias in which we try to understand the behavior of individuals in a different culture through the framework or views of our own culture.
  • Be aware of cultural influences:
    • The way we think about ourselves and others is heavily influenced by the culture in which we live.
    • Our understanding of psychology is based on research done primarily within the American cultural context.

Science in Context (continued)

• An ethnocentric bias can influence the research areas and questions we choose to pursue. For example:
  • Do we focus on deficits in aging people (e.g., declining memory) rather than strengths (e.g., wisdom)?
  • Do we examine questions of aggression and race rather than nurturance and race?
  • When developing a research question, be sure to consider whether you are being ethnocentric.
  • Consider developing a research question that goes against the cultural norm.
Science in Context

• An ethnocentric bias also influences how we interpret behavior.
• Consider, for example, how we stereotype people based on their dress or hairstyle (e.g., "Goth," Hip-Hop).
• Has your behavior ever been interpreted in terms of an ethnocentric bias?

Science in Context
Historical, Social/Cultural, and Moral Contexts

• Historical Context
  • The scope of scientific psychology has increased dramatically in 100 years.
  • The American Psychological Association (APA) and the American Psychological Society (APS) promote the science of psychology.
  • At the turn of the 20th century, early psychologists adopted the empirical approach as the best means for developing the science of psychology.
  • The computer revolution has been a key factor in the shift from behaviorism to cognitive psychology as the dominant theoretical perspective in psychology.

Psychological Science
Social/Historical Context

• Zeitgeist—Spirit of the times
  • What to study
  • How to study
  • Funding
    • Acceptability of findings