CHAPTER 1
The Science of Psychology

What Is Psychology?

- Psychology:
  - Essentially trying to understand people
  - the scientific study of behavior and mental processes
    - behavior: outward or overt actions and reactions
    - mental processes: internal, covert activity of our minds

Psychology is a Science

- Prevent possible biases from leading to faulty observations
- Precise and careful measurement
- Some consider psychology to be a “soft” science

Psychology's Four Goals

- Description
  - What is happening?
- Explanation
  - Why is it happening?
  - Theory: general explanation of a set of observations or facts

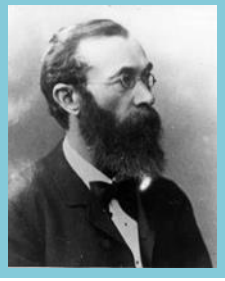
Psychology's Four Goals

- Prediction
  - Will it happen again?
  - When?
- Control
  - How can it be changed?

Structuralism

- Structuralism
  - Focused on the structure or basic elements of the mind
  - Attempt to break every experience down to individual emotions and sensations

Structuralism



- Wilhelm Wundt's psychology laboratory
  - Germany in 1879
  - Developed the technique of *objective introspection*: the process of objectively examining and measuring one's thoughts and mental activities
    - A rock is placed in your hand, you note everything that you feel as a result of having a rock in your hand (i.e., sensations stimulated by the rock, how heavy it is, its texture etc.)

Structuralism

- Edward Titchener
  - Wundt's student; brought structuralism to America
  - Also thought that introspection could be applied to thoughts
- Margaret Washburn
  - Titchener's student; first woman to earn a Ph.D. in psychology
- Structuralism died out in the early 1900s.

Functionalism

- Functionalism
  - More interested in the importance of consciousness to everyday life
  - how the mind allows people to adapt, live, work, and play
- Proposed by William James
  - Harvard
  - Wrote the first textbook on psychology

Functionalism

- Influenced the modern fields of:
  - educational psychology
  - evolutionary psychology
  - industrial/organizational psychology

Functionalism

- Injustices
  - Mary Whiton Calkins; denied Ph.D. because she was a woman
    - Completed every credit under James
    - Went on to be an influential professor and researcher, APA president

Fucntionalism

- First African American to earn a PhD in psychology – 1920
  - Francis Cecil Sumner
  - Clark University

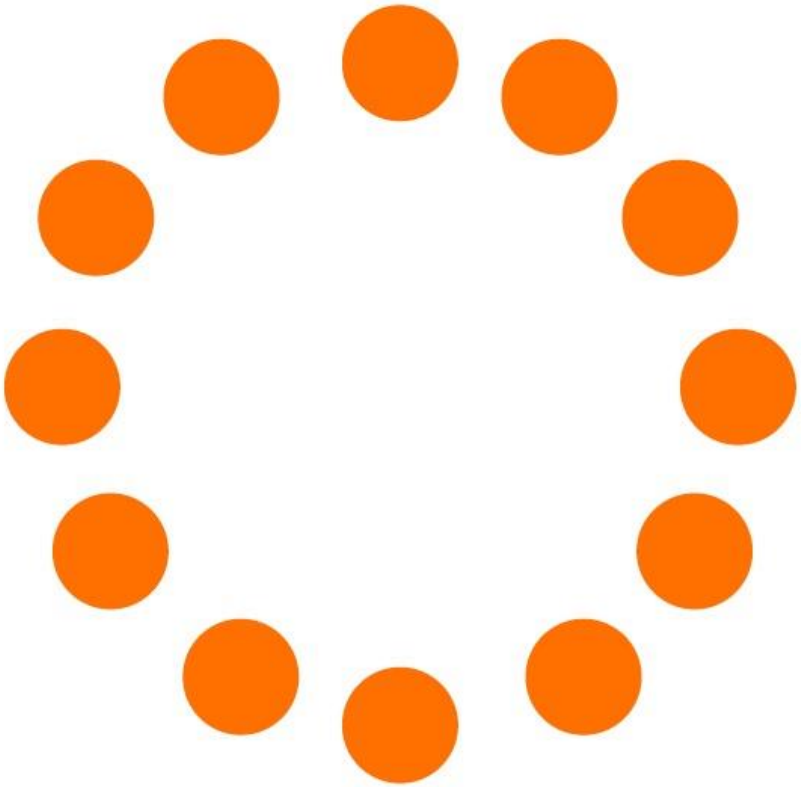
Gestalt Psychology

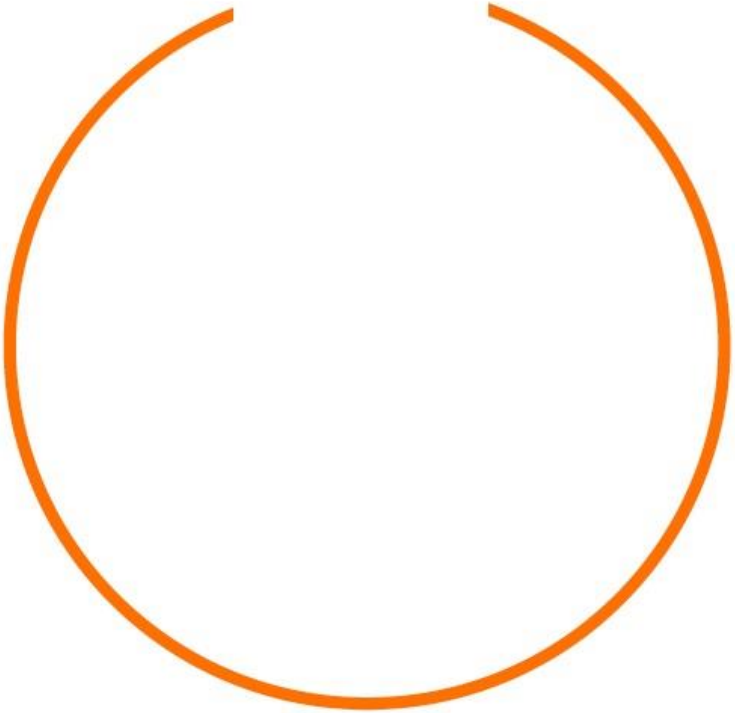
- Gestalt
  - “good figure” psychology
- Started with Wertheimer, who studied sensation and perception
  - Focus on studying patterns

Gestalt Psychology

- Gestalt ideas now part of the study of cognitive psychology
  - cognitive psychology: field focusing not only on perception but also on learning, memory, thought processes, and problem solving

Figure 1.1 A Gestalt Perception
The eye tends to “fill in” the blanks hereand sees both of these figures as circles rather than as a series of dots or a broken line.





Psychoanalysis

- Happened around the same time as structuralism and functionalism
- Psychoanalysis: theory and therapy based on the work of Sigmund Freud

Psychoanalysis

- Freud's patients suffered from nervous disorders with no apparent physical cause.
  - Freud proposed the existence of an unconscious (unaware) mind into which we push—or repress—our threatening urges and desires
  - believed that these repressed urges, in trying to surface, created nervous disorders
  - stressed the importance of early childhood experiences

Behaviorism

- Behaviorism
  - Challenged structuralism, functionalism, and psychoanalysis
  - science of behavior that focuses on observable behavior only
  - must be directly seen and measured

Behaviorism

- Proposed by John B. Watson
  - based on the work of Ivan Pavlov, who demonstrated that a reflex could be conditioned (learned)
  - Watson believed that phobias were learned
    - case of “Little Albert”: baby taught to fear a white rat

Give me a dozen healthy infants, well-formed, and my own specified world in which to bring them up in and I'll guarantee to take any one at random and train him to become any type of specialist I might select—doctor, lawyer, artist, merchant chief, and, yes, even beggarman and thief, regardless of his talents, penchants, tendencies, abilities, vocations, and race of his ancestors.

(John B. Watson)

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Modern Perspectives

- Psychodynamic perspective: modern version of psychoanalysis
  - more focused on the development of a sense of self and the discovery of motivations behind a person's behavior other than sexual motivations

Modern Perspectives

- Behavioral perspective
  - B. F. Skinner studied operant conditioning of voluntary behavior
  - Behaviorism became a major force in the twentieth century
  - Skinner introduced the concept of reinforcement

Modern Perspectives

- Humanistic perspective
  - Takes its ideas more from philosophy
  - People have free will: the freedom to choose their own destiny
  - Early founders:
    - Abraham Maslow
    - Carl Rogers

Modern Perspectives

- Humanistic perspective
  - Emphasizes the human potential, the ability of each person to become the best person he or she could be
    - self-actualization: achieving one's full potential or actual self
    - People have *free will* – the freedom to choose their own destiny

Modern Perspectives

- Cognitive perspective
  - focuses on memory, intelligence, perception, problem solving, and learning
  - Compares the brain to a computer
- Cognitive neuroscience
  - New field studying the physical workings of the brain and nervous system when engaged in memory, thinking, and other processes
    - Use MRI, fMRI, PET

Modern Perspectives

- Sociocultural perspective
  - Combines two areas of psychology:
    - Social psychology – the study of groups, social roles, and rules of social actions and relationships
    - Cultural psychology – the study of cultural norms, values, and expectations
  - focuses on the relationship between social behavior and culture

Modern Perspectives

- Biopsychological perspective
  - attributes human and animal behavior to biological events occurring in the body, such as genetic influences, hormones, and the activity of the nervous system
  - Study topics such as sleep, emotions, aggression, sexual behavior, learning, memory, mental disorders

Modern Perspectives

- Evolutionary perspective
  - focuses on the biological bases of universal mental characteristics that all humans share
  - looks at the way the mind works and why it works as it does
  - behavior seen as having an adaptive or survival value
  - How the adaptations our ancestors developed influence our behavior today

Types of Psychological Professionals

- Psychologist
  - professional with an academic degree and specialized training in one or more areas of psychology
  - can do counseling, teaching, and research; may specialize in any one of a large number of areas within psychology
    - areas of specialization in psychology include clinical, counseling, developmental, social, and personality, among others

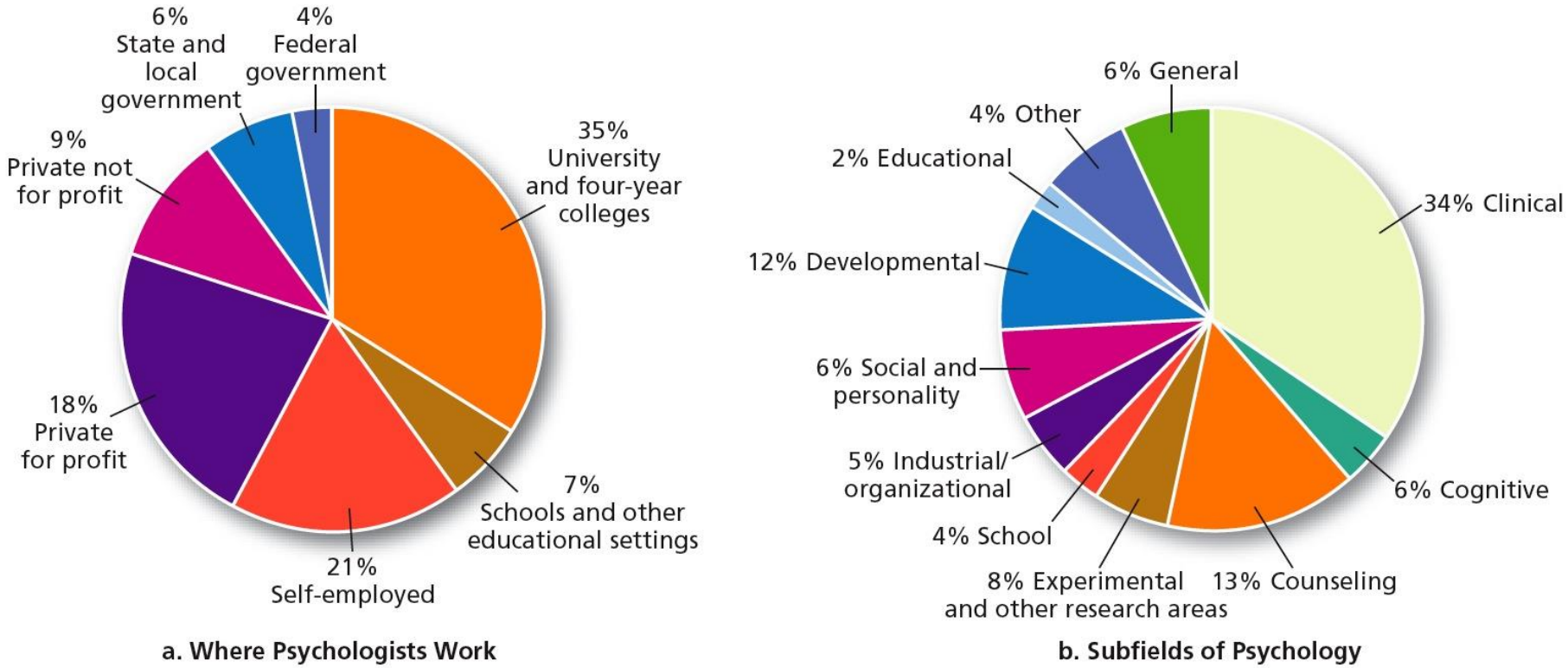
Types of Psychological Professionals

- Psychiatrist
  - medical doctor who has specialized in the diagnosis and treatment of psychological disorders
  - Can prescribe medicine
  - Has to go to medical school

Types of Psychological Professionals

- Psychiatric social worker
  - social worker with some training in therapy methods who focuses on the environmental conditions that can have an impact on mental disorders, such as poverty, overcrowding, stress, and drug abuse

Figure 1.2 Work Settings and Subfields of Psychology
(a) There are many different work settings for psychologists. Although not obvious from the chart,many psychologists work in more than one setting. For example, a clinical psychologist may work in a hospital setting and teach at a university or college. (Tsapogas et al., 2006) (b) This pie chart shows the specialty areas of psychologists who recently received their doctorates. (Hoffer et al., 2007)



Psychology and the Scientific Method

- Scientific method
  - system of gathering data so that bias and error in measurement are reduced

Psychology and the Scientific Method

- Steps in the scientific method:
  1. Perceive the question
  2. Form a hypothesis: tentative explanation of a phenomenon based on observations.
  3. Test the hypothesis
  4. Draw conclusions
  5. Report your results so that others can try to replicate, or repeat, the study or experiment to see whether the same results will be obtained in an effort to demonstrate reliability of results

Descriptive Methods

- Naturalistic observation
  - watching animals or humans behave in their normal environment
  - major advantage: realistic picture of behavior

Descriptive Methods

- Naturalistic observation: disadvantages
  - observer effect: tendency of people or animals to behave differently when they know they are being observed
    - participant observation: a naturalistic observation in which the observer becomes a participant in the group being observed (to reduce observer effect)

Descriptive Methods

- Naturalistic observation: disadvantages
  - observer bias: tendency of observers to see what they expect to see
    - blind observers: people who do not know what the research question is (to reduce observer bias)
  - Each naturalistic setting is unique, and observations may not hold

Descriptive Methods

- Laboratory observation
  - watching animals or humans behave in a laboratory setting
  - advantages
    - control over environment
    - allows use of specialized equipment

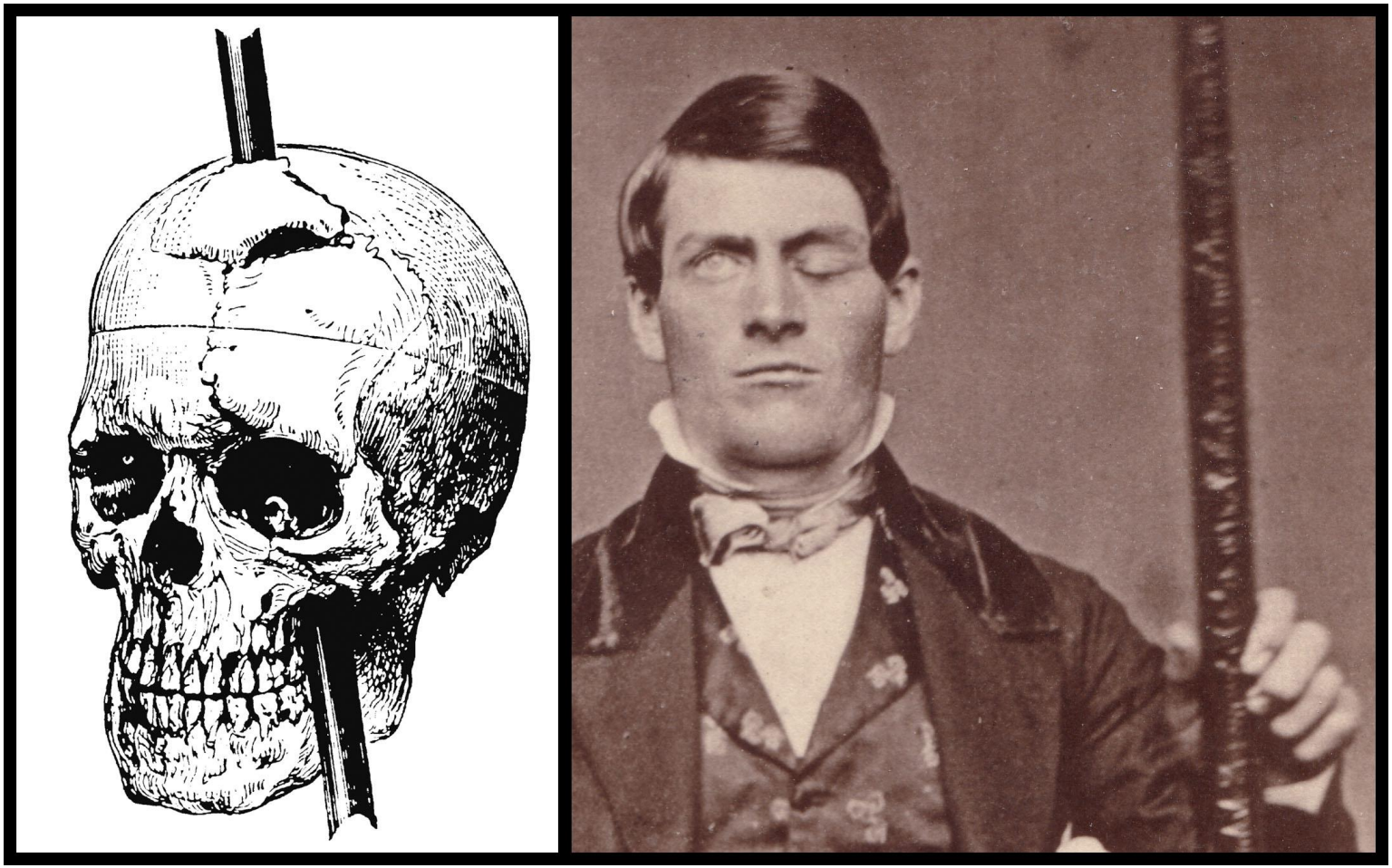
Descriptive Methods

- Laboratory observation: disadvantage
  - artificial situation may result in artificial behavior
- Descriptive methods lead to the formation of testable hypotheses

Descriptive Methods

- Case Study
  - study of one individual in great detail
  - advantage
    - tremendous amount of detail
  - disadvantage
    - cannot apply to others
  - famous case study: Phineas Gage

Phineas Gage



Descriptive Methods

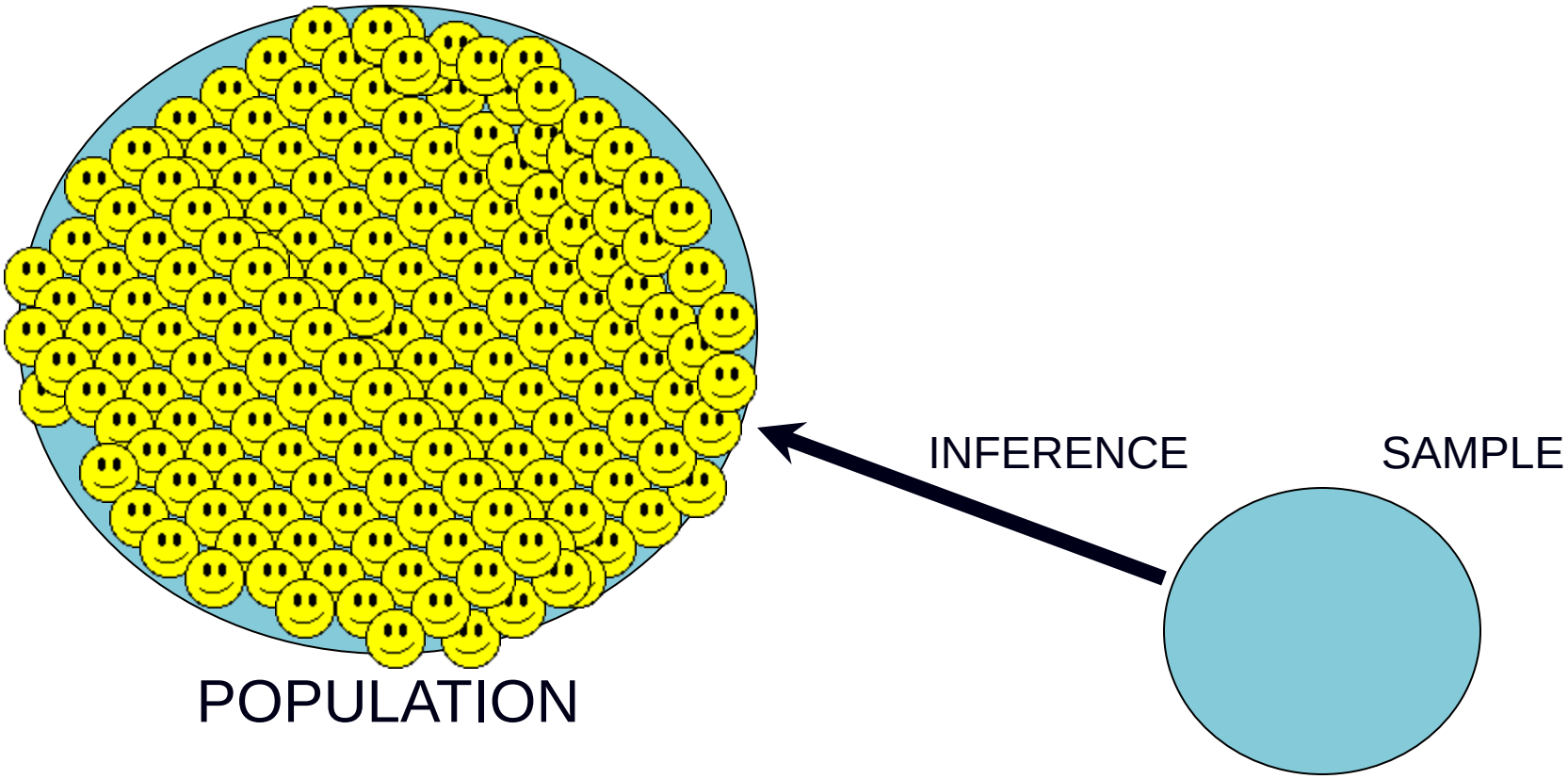
- Surveys
  - researchers ask a series of questions about the topic under study
- Given to representative sample
  - representative sample: randomly selected sample of subjects from a larger population of subjects
  - population: the entire group of people or animals in which the researcher is interested

Descriptive Methods

- Survey advantages
  - data from large numbers of people
  - study covert behaviors
- Survey disadvantages
  - researchers have to ensure representative sample or the results are not meaningful
  - people are not always accurate (response bias)

Descriptive Methods

- Random Sampling from Population



Finding Relationships

- Correlation
  - measure of the relationship between two variables
  - variable: anything that can change or vary

Finding Relationships

- Correlation
  - measures of two variables go into a mathematical formula and produce a correlation coefficient (r), which represents two things:
    - direction of the relationship
    - strength of the relationship
  - knowing the value of one variable allows researchers to predict the value of the other variable

Finding Relationships

- Correlation coefficient ranges from -1.00 to +1.00.
- The closer to +1.00 or -1.00, the stronger the relationship between the variables
  - no correlation = 0.0
  - perfect correlation = -1.00 or +1.00

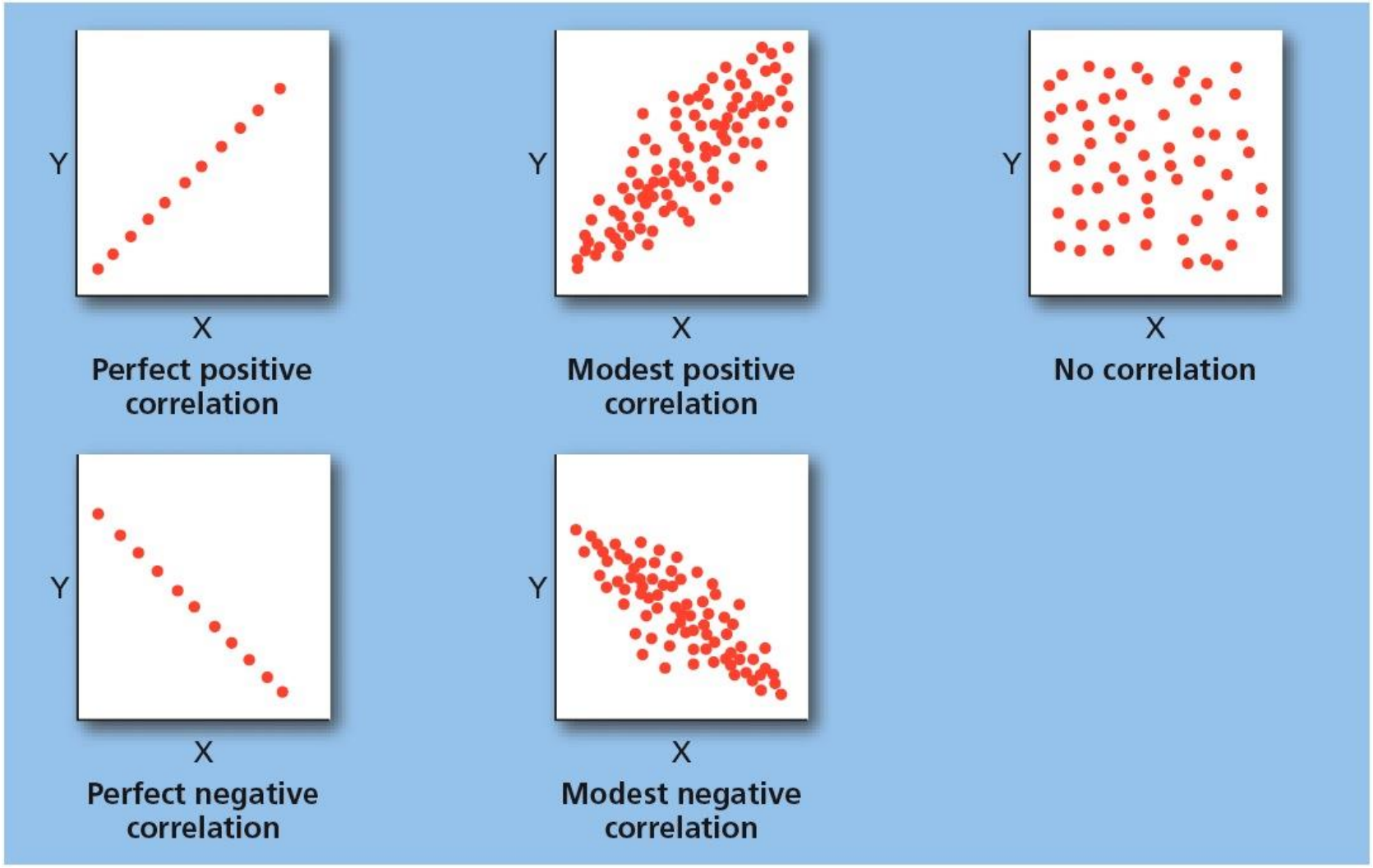
Finding Relationships

- positive correlation: variables are related in the same direction
  - as one increases, the other increases
  - as one decreases, the other decreases
- negative correlation: variables are related in opposite direction
  - as one increases, the other decreases
- Correlation does not prove causation!

Finding Relationships

Figure 1.3 Five Scatterplots

These scatterplots show direction and strength of correlation. It should be noted that perfect correlations, whether positive or negative, rarely occur in the real world.



The Experiment

- Experiment
  - a deliberate manipulation of a variable to see whether corresponding changes in behavior result, allowing the determination of cause-and-effect relationships
- Operational Definition
  - definition of a variable of interest that allows it to be directly measured
  - definition: aggressive play

The Experiment

- Independent variable (IV)
  - the variable in an experiment that is manipulated by the experimenter
  - IV: violent TV
- Dependent variable (DV)
  - the variable in an experiment that represents the measurable response or behavior of the subjects in the experiment
  - DV: aggressive play

The Experiment

- Experimental group
  - subjects in an experiment who are subjected to the independent variable
  - experimental group: watch TV

The Experiment

- Control group
  - subjects in an experiment who are not subjected to the independent variable and who may receive a placebo treatment (controls for confounding variables).
  - control group: no TV

The Experiment

- Random assignment
  - the process of assigning subjects to the experimental or control groups randomly, so that each subject has an equal chance of being in either group
  - controls for confounding (extraneous, interfering) variables

The Experiment

- Random Assignment

SAMPLE

Experimental Group

Test for Differences

Control Group

The Experiment

- Confounding Variables

SAMPLE

Experimental Group

Are differences due to manipulation or confounding variable (mood)?

Control Group

The Experiment

- No Confounding Variables

SAMPLE

Experimental Group

Differences are due to manipulation, not an extraneous variable, because mood is randomly determined.

Control Group

The Experiment

- Placebo effect
  - the phenomenon in which the expectations of the participants in a study can influence their behavior
- Single-blind study
  - subjects do not know whether they are in the experimental or the control group (reduces placebo effect)
  - the participants are “blind” to the treatment they receive

The Experiment

- Experimenter effect
  - tendency of the experimenter's expectations for a study to unintentionally influence the results of the study
- Double-blind study
  - neither the experimenter nor the subjects know which subjects are in the experimental or control group (reduces placebo effect and experimenter effect)

Example of a Real Experiment

- Hypothesis
  - knowing that other people might think one's success in school is due to athletic ability rather than intelligence can make an athlete perform poorly on an academic test
- Independent variable
  - timing of "threat"
- Dependent variable
  - test scores

Example of a Real Experiment

- Experimental group
  - answered “high threat” question before taking the test
- Control group
  - answered “high threat” question after taking the test
- Results-supported hypothesis
  - those asked the “high threat” question before the intellectual test scored significantly lower on that test

Ethics in Psychological Research

- Institutional review boards
  - groups of psychologists and other professionals who look over each proposed research study and judge it according to its safety and consideration for the participants in the study

Ethics in Psychological Research

- Common ethical guidelines:
  - The rights and well-being of participants must be weighed against the study's value to science.
  - Participants must be allowed to make an informed decision about participation.
  - Deception must be justified.
  - Participants may withdraw from the study at any time.

Ethics in Psychological Research

- Common ethical guidelines (cont'd):
  - Participants must be protected from risks or told explicitly of risks.
  - Investigators must debrief participants, telling them the true nature of the study and their expectations regarding the results.
  - Data must remain confidential.

Ethics in Psychological Research

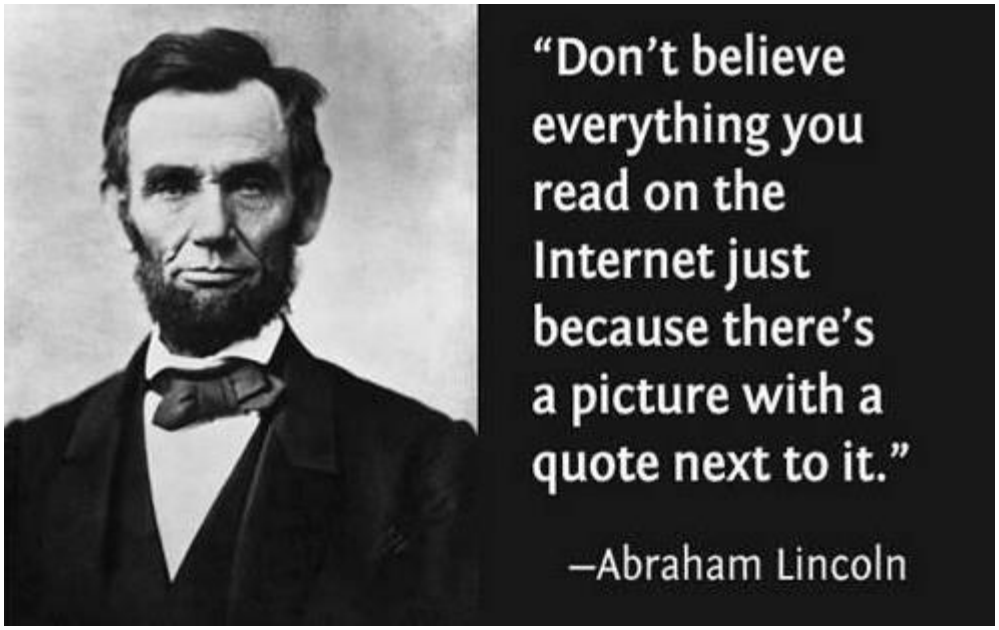
- Common ethical guidelines (cont'd):
  - If for any reason a study results in undesirable consequences for the participant, the researcher is responsible for detecting and removing, or correcting, these consequences.

Ethics in Psychological Research

- Animal research answers questions we could never investigate with human research.
- The focus is on avoiding exposing animal subjects to unnecessary pain or suffering.
- Animals are used in approximately 7 percent of psychological studies.

Critical Thinking

- Critical thinking
  - making reasoned judgments about claims
  - Something psychologists use, and can be helpful in daily life



Critical Thinking

- Four basic criteria:
  1. There are very few “truths” that do not need to be subjected to testing.
  2. All evidence is not equal in quality.
  3. Just because someone is considered to be an authority or to have a lot of expertise does not make everything that person claims automatically true.
  4. Critical thinking requires an open mind.

QUESTIONS?