What is psychology

Psychology is the science that studies behavior and mental (or cognitive) processes, and it is the profession that applies the accumulated knowledge of this science to practical problems.
Goals of Psychology

- description
- explanation
- prediction
- control
  for behavior and mental processes.
Methods of Science

- **Descriptive Research Methods:**
  - Naturalistic Observation
  - Case Study
  - Survey Research

- **Experimental Method**

- **Correlational Method**
Naturalistic Observation

Making unobtrusive observations in natural settings.

Potential problem: observer bias.

Example: Anthropologist Margaret Mead spent many years observing primitive cultures. She observed the degree of assertiveness in four different societies and found that assertiveness levels in men and women seemed to be strongly influenced by the culture.
Case Study

In-depth study of a single individual or a small number of persons through the use of observations, Interviews, and psychological testing over an extended period of time for the purpose of providing a detailed description of some behavior or disorder.

Limitations: causes of observed behavior cannot be established and degree to which findings can be generalized is not known.

Examples: Freud’s study of his own clients to develop a theory of personality and Luria’s study of the deficits in higher cortical function of men with penetrating head wounds during World War II.
Survey Research

The gathering of information about attitudes, beliefs, experiences, or behavior through the use of interviews and/or questionnaires

**Limitations:** the difficulties of selecting a representative sample and controlling subjects’ tendency to respond on the basis of social desirability

*representative sample:* a sample consists of the important subgroups (e.g., age, sex, education, income) in the same proportion as they are found in the population.

**Examples:** Research on the voting behavior of American voters by the Gallup poll, and survey of incidence of drug use by American high school students.
Experimental Method

The experimental method is the only method that is able to establish *cause-effect* by manipulation of independent variable to produce changes in dependent variable. It provide control for other irrelevant variations.

**Potential problems:**

- **Selection Bias** - controlled by random assignment of subjects in different groups
- **Placebo Effect** (effect due to mental expectation) – controlled by a control group given a placebo
- **Experimenter Bias** - controlled by the double-blind technique
Experimental Method

In an experiment, the variable which is assumed to influence a subject’s behavior and which is manipulated is called the independent variable.

In an experiment, the measure of a subject’s performance is the dependent variable.

In an experiment, the experimental group receives the treatment and the control group does not. The control group’s performance serves as a baseline for comparison purpose.
An investigator believed that children’s aggressive behavior will be increased by their observations of violence. To test his idea, he conducted an experiment. He showed films to two groups of children who were randomly assigned to two groups. One group viewed a segment of a very violent television program (“The Untouchables”). The other group viewed a program of a nonviolent athletic competition (a track event). Afterwards, he asked five graduate students (who were unaware of the design of his study or of which subjects were in which group) to observe and score instances of aggressive behavior in children from both groups playing together in a room. He found that children from the group who watched the “The Untouchables” behaved significantly more aggressively than the children from the other group.
Experimental Method - Example

In this experiment, the independent variable was:
  - type of film (violent vs. nonviolent)

the dependent variable was:
  - aggressive acts observed in children (subjects)

the experimental group was:
  - the group of children who watched the “Untouchables”

the control group was:
  - the group of children who watched the track event

Why did the researcher not score the children’s behaviors himself?
  - to avoid experimenter bias

What was the hypothesis of this experiment?
  - Watching TV violence can cause increase in aggression.
Correlational Study

Correlational study is the study of relationships (associations expressed as correlation coefficients) between two or more variables. It allows us to make possible predictions about performance on one variable from knowledge of performance on a related (correlated) variable.

Limitations: inability to infer cause-effect relationships from results
Correlational Study

Type of Correlation:

Positive correlation: two variables change in the same direction, e.g., the more you study, the better your grades tend to be.

Negative correlation: two variables change in the opposite directions, e.g., the more the police on the street, the fewer the crimes tend to occur.

Correlation coefficients: a number ranging from –1.00 to +1.00 to indicate the type and strength of correlation. The sign (+ or -) indicate whether there is a positive or a negative correlation. The numbers close to +1.00 and –1.00 (e.g., +0.85 or –0.78) indicate strong correlation, whereas the numbers close to 0.00 indicate weak association (e.g., +0.15 or –0.05).
Correlational Study - Examples

1. Studies have found a strong positive correlation between SAT scores and college academic performance (GPAs). SAT scores have been used in the admission process by colleges, because they predict college academic performance.

2. Correlational studies have found a strong positive correlation between smoking and lung cancer in humans.
An investigator was interested in the effect of a nutritionally poor diet during pregnancy on the likelihood of brain defects. He realized it would be unethical to take a group of pregnant women and randomly assign half of them to a condition in which they would consume a nutritionally inadequate diet. He chose instead to conduct a correlational study. He collected data on the nutritional adequacy of the mother’s diet and the occurrence of birth defects for all children born in the hospitals of a large city for one month. He found that the two variables are significantly related (correlation coefficient was –0.80, the more adequate the diet, the fewer the birth defects). Can he conclude that the children’s birth defects are caused by the mother’s nutritionally inadequate diet?

No, he did not conduct an experimental study to establish a cause-effect relationship between the two variables. There are many possible reasons why the two variables are strongly related (e.g., alcohol or drug use may be related to poor diet).
APA Ethical Guidelines for Psychological Research

- Participation in research must be strictly voluntary.
- Participants must give informed consent.
- If deception is used, then subjects must be debriefed as soon as possible after the study.