UNIT 2
ANSWERS
UNIT REVIEW
The Need for Psychological Science

1. hindsight bias; common; both children and adults
2. overconfidence
3. equally wrong
4. curiosity; skepticism; humility
5. critical thinking

How Do Psychologists Ask and Answer Questions?

1. scientific method; observations; theories; revised; observations
2. theory; hypotheses; research
3. operational definitions; replicate
4. organizes; predictions
5. descriptive; correlational; experimental
6. case study
7. hypotheses; atypical
8. survey; wording
9. vivid
10. random; population; does
11. are
12. naturalistic observation
13. describe
14. social; solitary; varies
15. correlated; predict; correlation coefficient; scatterplot
16. positively correlated; negatively correlated; inversely
17. strength; weakness; causation; cause-effect

This is an example of a negative correlation. As one factor (time spent studying) increases, the other factor (anxiety level) decreases.

18. predicted
19. event; caused; explanation
20. illusory correlation
21. confirm; superstitious
22. random events
23. more; do not
24. cause; effect; statistically; factors
25. do; experiments; randomly; manipulates; holding constant
26. experimental; effect
27. double-blind
28. placebo; placebo effect
29. experimental; control
30. random assignment
31. independent; confounding; dependent
32. manipulate; independent; dependent; control

Experimentation has the advantage of increasing the investigator's control of both relevant and irrelevant variables that might influence behavior. Experiments also permit the investigator to go beyond observation and description to uncover cause-effect relationships in behavior.

Statistical Reasoning in Everyday Life

1. statistics
2. data; organize; bar graph; scale labels; range
3. mode; median; mean
4. mode
5. sum; number
7. skewed; mean
8. low; high
9. range; standard deviation
10. difference between the lowest and highest scores
11. crude; is
12. more accurate; does
13. mean; normal curve (normal distribution)
14. representative; biased
15. low
16. less
17. significance; chance; reliable; relatively large
18. practical

Frequently Asked Questions About Psychology

1. principles
2. control; general principles
3. ideas; behaviors; attitudes; traditions
4. processes ; dyslexia; brain; genders
5. similarities; diseases
6. ethical; well-being
7. safeguards

8.informed consent; debriefed

Ethical guidelines require investigators to (1) obtain informed consent from potential participants; (2) protect them from harm and discomfort, (3) treat information obtained from participants confidentially, and (4) fully explain the research afterward.

9. do
10. can; enlighten

Progress Test 1

Multiple-Choice Questions

1. a. is the answer. In a case study, one person is studied in depth. (p. 26)
   b. In survey research, a group of people is interviewed.
   c. Correlations identify whether two factors are related.
   d. In an experiment, an investigator manipulates one variable to observe its effect on another.
2. c. is the answer. Exercise is the variable being manipulated in the experiment. (p. 35) .
   a. A control condition for this experiment would be a group of people not permitted to exercise.
   b. An intervening variable is a variable other than those being manipulated that may influence behavior.
   d. The dependent variable is the behavior measured by the experimenter-in this case, the effects of exercise.
3. c. is the answer. The control condition is that for which the experimental treatment (the new drug) is absent. (p. 35)
   a. A random sample is a subset of a population in which every person has an equal chance of being selected.
   b. The experimental condition is the group for which the experimental treatment (the new drug) is present.
   d. "Test group" is an ambiguous term; both the experimental and control group are tested.

a. Hypotheses are testable propositions.
b. Dependent variables are factors that may change in response to manipulated independent variables.
c. Statistical indexes may be used to test specific hypotheses (and therefore as indirect tests of theories), but they are merely mathematical tools, not general principles, as are theories.

5. d. is. the answer. In this case, the children are being observed in their normal environment rather than in a laboratory.(p. 28) a•. Correlational research measures relationships between two factors. The psychologist may later want to determine whether there are correlations between the variables studied under natural conditions.
   b. In a case study, one subject is studied in depth.
   c. This is not an experiment because the psychologist is not directly controlling the variables being studied.
6. d. is the answer. (p. 26)
7. d. is the answer. (p. 23)
8. b.is the answer. Replication is the repetition of an experiment in order to determine whether its findings are reliable. It is not a research method. (p.26)
9. c. is the answer. (p. 46) a., b., & d. Psychologists' personal values can influence all of these.
10. b. is the answer. (p. 30)
    a. & c. These answers would have been correct had the question stated that there is a positive correlation between shoe size and IQ. Actually, there is probably no correlation at all!
11. d. is the answer. In an experiment, it would be possible to manipulate alcohol consumption and observe the effects, if any, on memory. (p. 34) a., b" & c. These answers are incorrect because only by directly controlling the variables of interest can a researcher uncover cause-effect relationships.
12. d. is the answer. (p. 28)
    a. A sample is a subset of a population.
    b. & c. Control and experimental groups are used in experimentation, not in survey research.
13. c. is the answer. The mean is the sum of scores divided by the number of scores. [(2 + 3 + 7 + 6 + 1 + 4 + 9 + 5 + 8 + 2)/10 = 4.7.] (p. 38)
14. d. is the answer. When the scores are put in order (1,2,3,4, 7, 7, 8),4 is at the 50th percentile, splitting the distribution in half. (p. 38)
15. b. is the answer. The mode is the most frequently occurring score. Because there are more "twos" than any other number in the distribution, 2 is the mode. (p. 37)
16. d. is the answer. (pp. 40-41)
17. c. is the answer. (p. 40)
    a. A statistically significant difference mayor may not be of practical importance.
    b. This is often the case when a difference is not statistically significant.
18. c. is the answer. (p. 38)
    a. In an experiment, a placebo effect means that results were achieved by expectation alone.
    b. This is the false perception of a relationship between two events.
    c. This is the tendency to believe, after learning an outcome, that one could have foreseen it.
20. a. is the answer. As an average, calculated by adding all scores and dividing by the number of scores, the mean could easily be affected by the inclusion of a few extreme scores. (p. 38)
    b. The range is not a measure of central tendency.
    c. & d. The median and mode give equal weight to all scores; each counts only once and its numerical value is unimportant.

Matching Items

1. i (p. 43)	6. b (p. 39)	11. d (p. 39)
2. f (p. 38)	7. h (p. 39)	12. k (p. 24)
3. l (p. 35)	8. g (p. 29)	13. m (p. 32)
4. j (p. 20)	9. c (p. 38)	
5. e (p. 37)	10. a (p. 37)	

Progress Test 2

Multiple-Choice Questions

1. d. is the answer. Only experiments can reveal cause-effect relationships; the other methods can only describe relationships. (p. 34)
2. d. is the answer. (p. 34)
   a. & b. The double-blind procedure is one way to create experimental and control groups.
   c. Research participants are randomly assigned to either an experimental or a control group.
3. d. is the answer. Animal shelters are forced to kill 50 times as many dogs and cats as are used in research. (p. 44)
4. d. is the answer. (p. 35)
   a. The control condition is the comparison group, in which the experimental treatment (the treatment of interest) is absent.
   b. Memory is a directly observed and measured dependent variable in this experiment.
   c. Attention is the independent variable, which is being manipulated.
5. c. is the answer. Only about 68 percent of all cases in a normal curve fall within one standard deviation on either side of the mean. (p. 40)
6. b. is the answer. (p. 20)
   a. The phenomenon is related to hindsight rather than foresight.
   c. & d. The phenomenon doesn't involve whether or not the intuitions are correct but rather people's attitude that they had the correct intuition.
7. b. is the answer. If enough participants are used in an experiment and they are randomly assigned to the two groups, any differences that emerge between the groups should stem from the experiment itself. (p. 34) a., c., & d. None of these terms describes precautions taken in setting

8. b. is the answer. (p. 32)
9. a. is the answer. (p. 40)
   b. & c. Large, random samples are more likely to be representative of the populations from which they are drawn.
10. d. is the answer. Because we are sensitive to dramatic or unusual events, we are especially likely to perceive a relationship between them. (p. 32) a., b., & c. The relationship between vivid events is no more likely to be significant, positive, or negative than that between less dramatic events.
11. b. is the answer. (p. 25)
   a. In fact, the artificiality of experiments is part of an intentional attempt to create a controlled environment in which to test theoretical principles that are applicable to all behaviors.
   c. Some psychological theories go against what we consider common sense; furthermore, on many issues that psychology addresses, it's far from clear what the "common sense" position is.
   d. Psychology has always had ties to other disciplines, and in recent times, these ties have been . increasing.
12. d. is the answer. Correlations show how well one factor can be predicted from another. (p. 29)
   a. Because a case study focuses in great detail on the behavior of an individual, it's probably not useful in showing whether predictions are possible.
   b. Naturalistic observation is a method of describing, rather than predicting, behavior.
   c. In experimental research the effects of manipulated independent variables on dependent variables are measured. It is not clear how an experiment could help determine whether IQ tests predict academic success.
13. b. is the answer. The control condition is the one in which the treatment-in this case, pollution is absent. (p. 35)
   a. Students in the polluted room would be in the experimental condition.
   c. Presumably, all students in both conditions were randomly assigned to their groups. Random assignment is a method for establishing groups, rather than a condition.
   d. The word dependent refers to a kind of variable in experiments; conditions are either experimental or control.
14. c. is the answer. The lighting is the factor being manipulated. (p. 35)
   a. & d. These answers are incorrect because they involve aspects of the experiment other than the variables.
   b. This answer is the dependent, not the independent, variable.
15. b. is the answer. (pp. 37-38)
16. c. is the answer. The mean is the sum of the scores divided by the number of scores (60/10 = 6). (p. 38)
17. c. is the answer. When the scores are put in order (5,6, 7, 8, 9, 10, II), 8 is at the 50th percentile, splitting the distribution in half. (p. 38)
18. d. is the answer. Since the range is the difference between the highest and lowest scores, it is by definition affected by extreme scores. (p. 39)
   a. & c. The mean and mode are measures of central tendency, not of variation.
   b. The standard deviation is less affected than the range because, when it is calculated, the deviation of every score from the mean is computed.
19. b. is the answer. Averages derived from scores with low variability tend to be nlore reliable estimates of the populations from which they are drawn. Thus, a. and c. are incorrect. Because the standard deviation is a more accurate estimate of variability than the range, d. is incorrect. (p. 40)
20. d. is the answer. A difference that is statistically significant is a true difference, rather than an apparent difference due to factors such as sampling variation, and it is reliable. (p. 41)

Psychology Applied

Multiple-Choice Questions

1. b. is the answer. A general belief such as this one is a theory; it helps organize, explain, and generate testable predictions (called hypotheses) such as "boys drink more soft drinks than girls."
   (p.25)
   c. & d. Independent and dependent variables are experimental treatments and behaviors, respectively. Beliefs and predictions may involve such variables, but are not themselves those variables.
2. c. is the answer. The members of one club are' likely to share more interests, traits, and attitudes than will the members of a random sample of students. (pp. 27-28)
   a. & b. Unlike experiments, surveys do not specify or directly manipulate independent and dependent variables. In a sense, survey questions are independent variables, and the answers, dependent variables.
3. b. is the answer. (p. 35)
   a. Although the descriptive methods of case studies, surveys, naturalistic observation, and correlational research do not involve control of variables, they nevertheless enable researchers to describe and predict behavior.
   c. Whether or not a sample is representative of a population, rather than control over variables, determines whether results can be generalized from a sample to a population.
4. c. is the answer. To determine the effects of caffeine on reaction time, Martina needs to measure reaction time in a control, or comparison, group that does not receive caffeine. (p. 35)
   a. Caffeine is the independent variable.
   b. Reaction time is the dependent variable.
   d. Whether or not Martina's experiment can be replicated is determined by the precision with which she reports her procedures, which is not an aspect of research strategy.

a. This is not an experiment because the researcher is not manipulating the independent variable (seating position); she is merely measuring whether variation in this factor predicts test performance.
c. If the study were based entirely on students', self-reported responses, this would be a survey.
d. This study goes beyond naturalistic observation, which merely describes behavior as it occurs, to determine if test scores can be predicted from students' seating position.

6. d. is the answer. (p. 42)

7. d. is the answer. Selecting every tenth person would probably result in a representative sample of the entire population of students. (pp. 27-28)
   a. It would be difficult, if not impossible, to survey every student.
   b. Psychology students are not representative of the entire student population.
   c. This answer is incorrect for the same reason as
   b. This would constitute a biased sample.

8. d. is the answer. (p. 30)
   a. Correlation does not imply causality.
   b. Again, a positive correlation simply means that two factors tend to increase or decrease together; further relationships are not implied.
   c. A separate factor mayor may not be involved. That the two factors are correlated does not imply a separate factor. There may, for example, be a direct causal relationship between the two factors themselves.

9. b. is the answer. Psychology is a science because psychologists use the scientific method and approach the study of behavior and mental processes with attitudes of curiosity, skepticism, and humility. (pp. 22-23)
   a. Psychologists study both overt (observable) behaviors and covert thoughts and feelings.
   c. Psychologists' values definitely do influence their research.

10. b. is the answer. (p. 34)
    a. The low-dose comparison group is the control group.
    c. Rashad was not given a placebo.

11. d. is the answer. (p. 43)
    a. In fact, just the opposite is true.
    b. Actually, psychological experiments tend to use the most readily available people, often white North American college students.
    c. Although this may be true, psychological experiments ren1ain importa!1t because they help explain underlying processes of human behavior everywhere. Therefore, d. is a much better response than c.

12. d. is the answer. (p. 23)
    a. This follows from the attitude of skepticism, rather than humility.
    h. & c. Although both of these are true of the scientific method, neither has anything to do with humility.

13. a. is the answer. (p. 35)
    b. Use of a placebo tests whether the behavior of a treatment (such as a drug) is in effect, is the same as it would be if the treatment were actually present.
    c. & d. These are examples of blind and double-blind control procedures.

14. c. is the answer. If height and weight are positively correlated, increased height is associated with increased weight. Thus, one can predict a person's weight from his or her height. (p. 30)
    a. Correlation does not imply causality.
    b. This situation depicts a negative correlation between height and weight.

15. d. is the answer. A small or large standard deviation indicates whether a distribution is homogeneous or variable. (p. 39) a., b., & c. These statistics would not give any information regarding the consistency of performance.

16. c. is the answer. A correlation that is perceived but doesn't actually exist, as in the example, is known as an illusory correlation. (p. 32)
    a. Statistical significance is a statement of how likely it is that an obtained result occurred by chance.
    b. Overconfidence is the tendency to think we are more right than we actually are.
    d. Hindsight bias is the tendency to believe, after learning an outcome, that one would have foreseen it.

17. d. is the answer. (pp. 40-41)

18. c. is the answer. (pp. 37-38)
    a. The mean is computed as the sum of the scores divided by the number of scores.
    b. The median is the midmost score in a distribution.
    d. The range is the difference between the highest and lowest scores in a distribution.

19. a. is the answer. The mean is strongly influenced by extren1e scores. In this example, the mean would change from $25,000 to (75,000 + 25,000 + 25,000 + 25,000 + 25,000)/5 = $35,000. (p. 38)
    b. & c. Both the median and the mode would remain $25,000, even with the addition of the fifth family's income.
    d. The standard deviation is a measure of variation, not central tendency.

20. b. is the answer. (p. 40)
    a. If the difference between the sample means is not significant, then the groups probably do not differ in the measured ability.
    c. When a result is not significant it means that the observed difference is unreliable.

Essay Question

Elio's hypothesis is that daily aerobic exercise for one month will improve memory. Exercise is the independent variable. The dependent variable is memory. Exercise could be manipulated by having people in an experimental group jog for 30 minutes each day. Memory could be measured by comparing the number of words they recall from a test list studied before the exercise experiment begins, and again afterward. A control group that does not exercise is needed so that any improvement in the experimental group's memory

memory test. The control group should engage in some non-exercise activity for the same amount of time each day that the experimental group exercises. The participants should be randomly selected from the population at large, and then randomly assigned to the experimental and control groups.

Key Terms

1. Hindsight bias refers to the tendency to believe, after learning an outcome, that one would have foreseen it; also called the I-knew-it-all-along phenomenon. (p. 20)
2. Critical thinking is careful reasoning that examines assumptions, discerns hidden values, evaluates evidence, and assesses conclusions. (p. 24)
3. A theory is an explanation using an integrated set of principles that organizes observations and predicts behaviors or events. (p. 25)
4. A hypothesis is a testable prediction, often implied by a theory; testing the hypothesis helps scientists to test the theory. (p. 25)
   Example: In order to test his theory of why people conform, Solomon Asch formulated the testable hypothesis that an individual would be more likely to go along with the majority opinion of a large group than with that of a smaller group.
5. An operational definition is a precise statement of the procedures (operations) used to define research variables. (p. 26)
6. Replication is the process of repeating an experiment, often with different participants and in different situations, to see whether the basic finding generalizes to other people and circumstances. (p.26)
7. The case study is an observation technique in which one person is studied in great depth, often with the intention of revealing universal principles. (p. 26)
8. The survey is a technique for ascertaining the self-reported attitudes or behaviors of a representative, random sample of people. (p. 27)
9. A population consists of all the members of a group being studied. (p. 28)
10. A random sample is one that is representative because every member of the population has an equal chance of being included. (p. 28)
11. Naturalistic observation involves observing and recording behavior in naturally occurring situations without trying to manipulate and control the situation. (p. 28)
12. Correlation is a measure of the extent to which two factors vary together, and thus of how well either factor predicts the other. (p. 29)
13. The correlation coefficient is a statistical measure of the relationship; it can be positive or negative (from-1 to +1). (p. 29)
    Example: If there is a positive correlation between air temperature and ice cream sales, the warmer (higher) it is, the more ice cream is sold. If there is a negative correlation between air temperature and sales of cocoa, the cooler (lower) it is, the more cocoa is sold.
14. A scatterplot is a depiction of the relationship between two variables by means of a graphed cluster of dots. (p. 29)
15. Illusory correlation is the perception of a relationship where none exists. (p. 32)
16. An experiment is a research method in which a researcher directly manipulates one or more factors (independent variables) to observe the effect on some behavior or mental process (the dependent variable); experiments therefore make it possible to establish cause-effect relationships. (p. 34)
17. Random assignment is the procedure of assigning participants to the experimental and control conditions by chance, thus minimizing preexisting differences between those assigned to the different groups. (p. 34)
18. A double-blind procedure is an experimental procedure in which neither the experimenter nor the research participants are aware of which group is receiving the treatment. It is used to prevent experimenters' and participants' expectations from influencing the results of an experiment. (p. 35)
19. The placebo effect occurs when the results of an experiment are caused by expectations alone. (p.35)
20. The experimental group in an experiment is one in which participants are exposed to the independent variable being studied. (p. 35)
    Example: In the study of the effects of a new drug on reaction time, participants in the experimental group would actually receive the drug being tested.
21. The control group in an experiment is one in which the treatment of interest, or independent variable, is withheld so that comparison to the experimental condition can be made. (p. 35)
    Example: The control group in an experiment testing the effects of a new drug on reaction time would be a group of participants given a placebo (inactive drug or sugar pill) instead of the drug being tested.
22. The independent variable of an experiment is the factor being manipulated and tested by the investigator. (p. 35)
    Example: In the study of the effects of a new drug on reaction time, the drug is the independent variable.
23. A confounding variable is any factor other than the independent variable that might affect the factor being measured in an experiment. (p. 35)
24. The dependent variable of an experiment is the factor being measured by the investigator, that is, the factor that may change in response to manipulations of the independent variable. (p. 35)
    Example: In the study of the effects of a new drug on reaction time, the participants' reaction time is the dependent variable.
25. The mode is the most frequently occurring score in a distribution; it is the simplest measure of central tendency to determine. (pp. 37-38)
26. The mean is the arithmetic average, the measure of central tendency computed by adding the scores in a distribution and dividing by the number of scores. (p. 38)

27. The median, another measure of central tendency, is the score that falls at the 50th percentile, cutting a distribution in half. (p. 38)
    Example: When the mean of a distribution is affected by a few extreme scores, the median is the more appropriate measure of central tendency.
28. The range is a measure of variation computed as the difference between the highest and lowest scores in a distribution. (p. 39)
29. The standard deviation is a computed measure of how much scores in a distribution deviate around the mean. Because it is based on every score in the distribution, it is a more precise measure of variation than the range. (p. 39)
30. The normal curve is the symmetricat bell-shaped distribution describing many types of psychological data, in which most scores fall near the mean, with fewer and fewer at the extremes. (p. 40)
31. Statistical significance means that an obtained result, such as the difference between the averages for two samples, very likely reflects a real difference rather than sampling variation or chance factors. Tests of statistical significance help researchers decide when they can justifiably generalize from an observed instance. (p. 41)
32. Culture is the enduring behaviors, ideas, attitudes, and traditions shared by a large group of people and transmitted from one generation to the next. (p. 43)
33. Informed consent is the ethical principle that research participants should be told enough about an experiment to enable them to decide whether they wish to participate. (p. 45)
34. Debriefing occurs when participants are fully informed about an experiment's purpose and procedures once the study has concluded. (p.45)