

**Chapter 2A—Scientific Methods in Psychology**

1. To say a result is replicable means that other investigators can get similar results.

- a. True
- b. False

ANSWER: True

2. A meta-analysis combines results from many studies as if they were one large study.

- a. True
- b. False

ANSWER: True

3. A scientific theory is just a guess.

- a. True
- b. False

ANSWER: False

4. A good scientific theory should be falsifiable.

- a. True
- b. False

ANSWER: True

5. If someone makes an interesting claim, such as extrasensory perception, anyone who doubts it has the “burden of proof.”

- a. True
- b. False

ANSWER: False

6. Other things being equal, scientists prefer the most parsimonious theory.

- a. True
- b. False

ANSWER: True

7. Several laboratory demonstrations of extrasensory perception are consistently replicable.

- a. True
- b. False

ANSWER: False

8. Claims for extrasensory perception are neither parsimonious nor replicable.

- a. True
- b. False

ANSWER: True

9. Most dictionary definitions are operational definitions.

- a. True
- b. False

ANSWER: False

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10. An operational definition tells how to measure something.

- a. True
- b. False

ANSWER: True

11. If you study everyone who volunteers for your study, you obtain a random sample of the population.

- a. True
- b. False

ANSWER: False

12. A case history studies a random sample of the population.

- a. True
- b. False

ANSWER: False

13. Changing the wording of a survey question causes many people to answer differently.

- a. True
- b. False

ANSWER: True

14. A correlation coefficient of  $-0.7$  represents a stronger relationship between variables than a correlation coefficient of  $+0.5$ .

- a. True
- b. False

ANSWER: True

15. If variable A has a strong positive correlation with variable B, then changes in variable A cause changes in variable B.

- a. True
- b. False

ANSWER: False

16. Properly conducted experiments allow researchers to draw conclusions about cause and effect.

- a. True
- b. False

ANSWER: True

17. Every experiment has at least one independent variable.

- a. True
- b. False

ANSWER: True

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18. In an experiment on how coffee affects alertness, the amount of coffee would be the dependent variable.
- a. True
  - b. False

ANSWER: False

19. The control group in an experiment is the group of people who have some control over what happens.
- a. True
  - b. False

ANSWER: False

20. Random assignment is an important procedure in both experiments and correlational research.
- a. True
  - b. False

ANSWER: False

21. The use of a blind observer reduces the influence of experimenter bias.
- a. True
  - b. False

ANSWER: True

22. A double-blind procedure reduces the influence of demand characteristics.
- a. True
  - b. False

ANSWER: True

23. If most patients recover from depression after a few months of therapy, we can conclude that the therapy was helpful.
- a. True
  - b. False

ANSWER: False

24. A before-and-after study can lead to a firm conclusion, even without a control group.
- a. True
  - b. False

ANSWER: False

25. The mean is especially useful if the scores approximate the normal distribution.
- a. True
  - b. False

ANSWER: True

26. Consider the following set of scores on a quiz: 70, 100, 85, 70, 75. The mean for this set of scores is 75.
- a. True
  - b. False

ANSWER: False

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27. Consider the following set of scores on a quiz: 70, 100, 85, 70, 75. The median for this set of scores is 75.

- a. True
- b. False

ANSWER: True

28. Consider the following set of scores on a quiz: 2, 2, 3, 5, 8. The median for this set of scores is 4.

- a. True
- b. False

ANSWER: False

29. In general, scientists are impressed with an experimental result if the  $p$  value is small.

- a. True
- b. False

ANSWER: True

30. If the  $p$  value of a research study is small, the 95 percent confidence intervals for each group will be large.

- a. True
- b. False

ANSWER: False

31. “It is unlikely that chance alone would produce results like this,” means that “It is unlikely that chance alone did produce these results.”

- a. True
- b. False

ANSWER: False

32. Some statistically significant results represent only random fluctuations in the data.

- a. True
- b. False

ANSWER: True

33. Psychologists are confident that almost any statistically significant result can be replicated.

- a. True
- b. False

ANSWER: False

34. Any ethical experiment on people begins by asking participants for their informed consent.

- a. True
- b. False

ANSWER: True

35. A statement that leads to a clear prediction is called a \_\_\_\_\_.

ANSWER: hypothesis

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36. The goal of scientific research is to establish comprehensive explanations of observable events. These explanations are called \_\_\_\_\_.

ANSWER: theories

37. If different researchers consistently get similar results, we say the results are \_\_\_\_\_.

ANSWER: replicable

38. If a theory is stated so precisely that we can see what evidence would count against it, we say the theory is \_\_\_\_\_.

ANSWER: falsifiable

39. If a theory makes simple, acceptable assumptions, we say the theory is \_\_\_\_\_.

ANSWER: parsimonious

40. One objection to claims of extrasensory perception is that the explanations are not parsimonious. Another objection is that the results are not \_\_\_\_\_.

ANSWER: replicable

41. A definition that states how to measure something is a(n) \_\_\_\_\_ definition.

ANSWER: operational

42. If every individual in the population has an equal chance of being selected for a sample, the sample is said to be a(n) \_\_\_\_\_ sample.

ANSWER: random

43. A researcher who wants to generalize the findings to apply to the whole population will, ideally, get what kind of sample? \_\_\_\_\_

ANSWER: random sample  
cross-cultural sample

44. A sample of the population that matches the whole population in percentage of males and females, old and young, and so on, is a(n) \_\_\_\_\_ sample.

ANSWER: representative

45. An instructor measures to what extent the students who attend class regularly also do well on the tests. This type of research is called a \_\_\_\_\_.

ANSWER: correlational study

46. A correlation coefficient ranges from a low of zero to a high of \_\_\_\_\_.

ANSWER: 1 (or “plus or minus 1”)  
1 or “plus or minus 1”  
1  
plus or minus 1

47. If an increase in one variable is not associated with any consistent increase or decrease in a second variable, then the correlation between the two variables is \_\_\_\_\_.

ANSWER: zero  
0

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48. To evaluate the effects of expectations, a researcher might give the experimental group a new drug and give the control group an inactive pill, known as a(n) \_\_\_\_\_

ANSWER: placebo

49. An experimenter manipulates one variable to see how it affects a second variable. The one the experimenter manipulates is the \_\_\_\_\_ variable.

ANSWER: independent

50. An experimenter manipulates one variable to see how it affects a second variable. The one the experimenter measures to see how it was affected is the \_\_\_\_\_ variable.

ANSWER: dependent

51. In a properly conducted experiment, the researcher assigns people to the experimental and control groups by a procedure known as \_\_\_\_\_ assignment.

ANSWER: random

52. To reduce or avoid effects of experimenter bias, it is best to have a \_\_\_\_\_ observer make the observations or collect the data.

ANSWER: blind

53. In many cases a researcher conceals the purpose of the study, so that participants will not be heavily influenced by \_\_\_\_\_ characteristics.

ANSWER: demand

54. A before-and-after study can provide invalid results if it has no \_\_\_\_\_ group.

ANSWER: control

55. The sum of all the scores divided by the total number of scores is called the \_\_\_\_\_. (NOT “average.” Give the more precise term.)

ANSWER: mean

56. If you arrange scores from the highest to the lowest, the middle one is called the \_\_\_\_\_.

ANSWER: median

57. Traditionally, most researchers have called a result “statistically significant” if \_\_\_\_\_ is less than 0.05.

ANSWER:  $p$

58. Recently, many psychologists have worried that because of random fluctuations in data, some published results, even though they are statistically significant, may not be \_\_\_\_\_.

ANSWER: replicable

59. Before conducting any experiment on humans, a psychological investigator must obtain \_\_\_\_\_ consent from the participants.

ANSWER: informed

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60. A scientist has formed the following hypothesis: Students who listen to music while studying will take longer to complete their reading and remember less of it. Once she has constructed her hypothesis, what are the three steps that she should follow to complete her experiment? State the steps and give an example of how to complete each step.

*AN* The first step is to devise a method to test the hypothesis. One way to assign students randomly to two groups, one of *SW* which listens to music and one that does not.

*ER*

: The next step is to collect results. In this case, she might ask each student to record the time he or she started reading and the time of finishing. At one or more later times she would administer tests of how well students in the two groups remembered the material.

The final step is to interpret the data and determine what the results mean. If the students listening to music took longer to finish and remembered less, then she gains confidence in her hypothesis. However, she should try to replicate the result, possibly using different types of music or different types of reading. If the groups did not differ, or if the group listening to music remembered more, then she should abandon or modify her hypothesis.

61. After defining the variables involved in a study, scientists have to identify individuals to study. The *population* is the group of individuals to whom we hope our conclusions will apply. Researchers generally hope that their conclusions will apply to a large population, such as all 20-year-olds in the country. Because it is not practical to examine everyone in the population, researchers study a *sample* of people and assume that the results for the sample apply to the whole population. Briefly define the following types of samples: convenience sample, representative sample, random sample, and cross-cultural sample.

*ANS Convenience Sample:* a group chosen because of its ease of study. An example is the use of college students taking a *WER* psychology course.

:

*Representative Sample:* closely resembles the population in its percentage of males and females, Blacks and Whites, young and old, or other characteristics that are likely to affect the results.

*Random Sample:* every individual in the population has an equal chance of being selected. For example, the researcher might take the census report for a state and try to contact 100 people (in this case, 100 20-year-olds), chosen at random from the list.

*Cross-Cultural Sample:* groups of people from at least two cultures, such as the United States and India.

62. Why are most psychological researchers skeptical of the idea of extrasensory perception?

*ANS* First, despite many attempts, no one has found evidence for extrasensory perception that is consistently replicable.

*WER* Second, because the idea conflicts with basic principles of physics, researchers seek a more parsimonious

: explanation.

63. Describe an example of a negative correlation.

*AN A few possible examples:* (1) The greater the number of days in a month spent exercising, the fewer the number of sick *SW* days used. (2) The more time someone practices golf, the lower the person's golf score, on average. (3) On average,

*ER* people who smoke more cigarettes have a shorter life expectancy. (4) The more times a student misses class, the lower

: the probable score on a test.

64. A professor assembles a group of volunteers to compare two methods of studying. One group spends an hour a day on the first subject (such as psychology), then an hour on the second (chemistry), and so forth. The other group goes back and forth, with a few minutes on each topic, repeating the sequence until completing the same total study time as the first group. At the end of a week, the professor tests each student's knowledge of each subject. Identify the independent variable and the dependent variable.

*ANSWE* The independent variable is the pattern of studying (one subject at a time or frequent changes). The dependent

*R:* variable is the test score at the end of the week.

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65. Falsifiability, independent variables, dependent variables, blind observers, and demand characteristics are all potential characteristics of an experiment. Which of these would an experimenter try to minimize or avoid, and why?

*AN* An experimenter would try to minimize or avoid demand characteristics, because these are cues that tell a participant *SW* what is expected of him or her and what the experimenter hopes to find. The experimenter would like the results to *ER*: depend on the experimental manipulation rather than participants' attempts to conform to the experimenter's predictions.

66. Why have many psychologists begun to worry that some of the published results may not be replicable?

*AN* Throughout the world, many psychological researchers are conducting studies. Overall, a huge number are conducted. *SW* Random fluctuations in the data will occasionally produce an unlikely event, with  $p < 0.05$ . Researchers attempt to *ER* publish any result that appears to be statistically significant, and therefore some of the published results (including : some that seem very interesting) may be accidents, or may represent a finding that occurs only under limited circumstances. (Also, some results are known to depend on incidental factors such as the odor of the experimenter!)