

Practice Multiple-Choice Explanations

1. **(D)**; It is a very common error to assume that a statistical relationship between two variables implies that one must have caused the other. An experiment is the only type or research design from which one can infer cause and effect. Option A is incorrect in that there is no IV in correlational research. Option C can also be eliminated as not specific to correlational research. Option B is simply incorrect, and choice E implies that this research yields only nominal data, which isn't so.
2. **(D)**; Option A refers to the target population, and Option E to the selection of participants, while Option D correctly refers to random assignment as occurring when all participants have an equal chance of being placed into the control or experimental condition.
3. **(B)**; Options C, D and E refer to the null hypothesis, counterbalancing and a double blind, all of which refer more directly to experimental methodology than to naturalistic observation. The challenge with this study is that all students may have their own idea of what prosocial behavior is and therefore may all record different behaviors, a clear operational definition will help inter-rater reliability as well as allow for replication.
4. **(B)**; Experiments are the only research method that can reasonably demonstrate a cause and effect relationship. Option A will attract attention from test takers, because the stem of the question refers to a relationship between two variables, but one cannot infer a causative link from correlational data.
5. **(B)**; Option A is incorrect because as demonstrated in earlier questions, an experimental design is the only type of research that can lead to cause and effect conclusions. Option C is incorrect because is quite possible and indeed essential to obtain a representative sample when conducting a survey. Choices D and E are simply not true.
6. **(B)**; The null hypothesis is the statement that the independent variable will have no effect on the dependent variable in an experiment. One goal of experimental methodology is to determine if one can “reject the null”, based on the evidence gathered. Students may be drawn to option D which depicts the alternative hypothesis, but unlike the null hypothesis, this predicts that the independent variable will have an impact on the dependent variable.
7. **(D)**; The independent variable, or I.V. in an experiment is the component that is manipulated by the experimenter. Members of the experimental group receive the I.V. The dependent variable, or D.V. refers to the measurement of results. Theoretically, it is dependent upon whether or not experimental subjects received the I.V. In this case, the researchers are testing the effect of teacher expectations (the I.V.) on student performance (the D.V.).

8. (C); In an experiment, the control group does not receive the independent variable. Researchers compare the results from the experimental group or groups with the results from the control group, to determine the effect, if any, of the I.V. The groups that the teachers received no information about will serve as a comparison for the other groups.
9. (D); There is no manipulation by the part of the experimenter in this study, therefore it is correlational as Jacob is looking for a link or relationship between athletic participation and grade point average. Students may be drawn to Option E but because of the lack of control over the independent variable (the students were already involved in athletics; the researcher did not manipulate this) it cannot be an experiment.
10. (C); There would almost surely be a negative correlation between temperature and amount of clothing one wears; that is, generally speaking, as temperature decreases, the amount of clothing increases. Option D can therefore be readily eliminated, since it refers to positive correlations. Option B represents a negative correlation which is too close to -1.0 to be practical, and Options A and E is incorrect since correlation coefficients range between -1.0 and +1.0.
11. (E); In a randomly selected sample every member of the population under study has an equal chance of being chosen, which ensures representativeness of the sample. Option A refers to random assignment to groups and Option C refers to stratified sampling.
12. (D); Options A and B refer to the standard deviation, which is not a measure of central tendency. Most students would be able to quickly calculate the mean of this set of numbers (it's six), and the remaining three choices all offer '6' as the mean. But there is no score that occurs more frequently than the others, and Choice D is the only option that notes there is no mode in this set.
13. (B); Cross-sectional studies compare different cohorts of individuals at a single point in time. Some students may be challenged by this question because they consider cross-sectional studies to be studies exclusively about a comparison between different age groups.
14. (D); Even if students are unfamiliar with z-scores, it should still be relatively easy to determine that the question is asking what percentage of test-takers fall between one standard deviation *below* and two standard deviations *above* the mean. Because the item refers to a normal distribution, this assesses a student's understanding of the percentages in each section of such the distribution. Because 34% of test takers score between the mean and one standard deviation above the mean; likewise in the opposite direction, and just under 13.5% score between one standard deviation and two standard deviations above the mean. Adding 34, 34 and 13.5 brings you to 81.5% of the entire sample.

15. (B); The “skewedness” of a distribution is determined by its unusual scores, although this is counterintuitive for some students. In a negatively skewed distribution, high scores are more common – low scores are rare. Those outlying low scores might pull the *average* of the group of scores down, but the middle score in the set will be much closer to the top end, and in that way might be a more useful measure of the central tendency of this kind of data set.