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Chapter 2 Test Bank

Multiple choice (listed by objective and section)

Describe what the scientific method is. (section 2.2)

1. Research methods
    a. Are not needed, human factors is mostly common sense.
    b. Are useful in defining goals.
    c. Can be used only in simulation studies.
    d. Ought to be employed only after the system has been designed.
2. In order to design something well, research methods
    a. Are needed to determine how to design the system and to test the system.
    b. Are not needed. Most human factors work is just common sense.
    c. Need only be used under certain circumstances.
    d. Should be used to test the system.
3. Research methods
    a. Cover the methods for theory development.
    b. Focuses mainly on inferential statistics.
    c. Includes the methods of data collection and analysis.
    d. Must include some form of experimentation.
4. Collecting information in a systematic and unbiased manner describes the
    a. Empirical method.
    b. Experimental method.
    c. Inferential method.
    d. Scientific method.

Compare and contrast basic and applied research. (section 2.3)

5. You are attempting to understand how individuals develop cognitive maps. This is an example of
    a. Applied research.
    b. Basic research.
    c. Quasi-experimental research.
    d. A study.
6. When conducting research that addresses real-world problems, this is
    a. Applied research.
    b. Basic research.
    c. Quasi-experimental research.
    d. A study.
7. Students are expected to propose an applied research project in their human factors course. Which of the following best represents applied research?
    a. Studying the impact of noise on levels of irritability.

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b. Determining the best level of lighting for enhancing learning when studying on computers.
c. Investigating the impact of computer screen brightness on legibility.
d. Evaluating the impact of an office layout on mood.

Define study, experiment, and quasi-experiment. (section 2.4.1)

8. When you evaluate a situation without manipulating any variables, this is considered a(n)
    a. Basic study.
    b. Experiment.
    c. Quasi-experiment.
    d. Study.
9. When you evaluate a situation and manipulate one or more variables, this is considered a(n)
    a. Basic study.
    b. Experiment.
    c. Quasi-experiment.
    d. Study.
10. You decide to study the differences between individuals in the college of engineering versus the college of arts and sciences. Given this comparison, your research is considered a(n)
    a. Basic study.
    b. Experiment.
    c. Quasi-experiment.
    d. Study.
11. To evaluate the impact of cognitive load on performance, you plan to control the amount of information a person must process. This best describes a(n)
    a. Basic study.
    b. Experiment.
    c. Quasi-experiment.
    d. Study.
12. Which of the following best describes a quasi-experiment?
    a. Students at your university are randomly assigned to different conditions.
    b. To investigate worker's perceptions of safety, you distribute a survey to all workers in the company.
    c. You will expose individuals to different room colors and expect differences in responses based on whether they live in the north or south.
    d. You will manipulate the layout complexity of a path and randomly assign individuals to the levels.

Define the terms related to conducting a research project. (section 2.4)

13. In your research, you propose that subjecting individuals to a loud, hot environment will lower performance. This is a

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a. Hypothesis.
b. Parsimonious explanation.
c. Replicable result.
d. Theory.

14. To understand how individuals process signage information, you recruit students to participate in your research. The students are the
a. Sample.
b. Population.
c. Covariate.
d. Criterion.

15. Collecting data from students at your university or elderly individuals at a near-by nursing home represents a(n)
a. Cohort sample.
b. Convenience sample.
c. Stratified sample.
d. Dependent sample.

16. If you randomly sample students, but make sure you get individuals from the different majors and who represent freshmen, sophomores, juniors, and seniors, this is a
a. Cohort sample
b. Independent sample.
c. Random assignment sample.
d. Stratified sample.

17. Random sampling refers to
a. Letting anyone who will participate, participate.
b. Obtaining a representative sample of the population in general.
c. Obtaining a representative sample of the population of interest.
d. Selecting a small stratified group of individuals.

18. The sample size you need for your research will be
a. Larger if the effect size is expected to be small.
b. Larger if you achieve a strong power analysis.
c. Smaller if the effect size is expected to be small.
d. Smaller if you achieve a weak power analysis.

19. Elderly individuals are asked to perform a driving task in a simulator. The driving complexity and number of passengers will be varied to determine the impact on driving performance. Driving performance is the
a. Confounding factor.
b. Covariate.
c. Dependent variable.
d. Independent dependent variable.

20. As you increase the complexity of the building layout for your research project, you also measure the level of mobility someone has, as this could impact one's speed of completing the wayfinding task. Level of mobility is a
a. Covariate.

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b. Criterion.
c. Dependent variable.
d. Third variable problem.

21. When variables are described in concrete, measurable terms, the measure has been
    a. Confounded.
    b. Determined to be a covariate.
    c. Operationalized.
    d. Set as a criterion.
22. You hypothesize that older adults will have slower reaction times in your driving simulation research. Your hypothesis is the
    a. Alternative hypothesis.
    b. Null hypothesis.
    c. Operationalized hypothesis.
    d. Parsimonious hypothesis.

Define reliability and validity. (section 2.4.6)

23. If your measure has test-retest reliability,
    a. It is clear that the items measure a similar construct.
    b. It is possible to predict an outcome measure.
    c. The construct being measured is stable.
    d. The measure results in similar scores on both tests.
24. If you achieve inter-rater reliability,
    a. A rater is a reliable rater on self-report measures.
    b. Raters tend to have similar ratings.
    c. The content of the measure is measuring the same construct.
    d. You also have face validity.
25. Your correlation coefficient for reliability is r = .56. This suggests _____ reliability.
    a. High.
    b. Low.
    c. No.
    d. Spurious.
26. You assess whether your measure is truly tapping the concepts you want to measure. You are assessing
    a. Congruency.
    b. Predictability.
    c. Reliability.
    d. Validity.
27. Subject matter experts reviewed your measure to ensure the items were measuring what you wanted to measure. This represents evidence for
    a. Face validity.
    b. Content validity.
    c. Criterion-related validity.
    d. Construct validity.

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Describe the difference between descriptive and inferential methods. (section 2.5)

28. Descriptive methods help us
    a. Collect more informative data.
    b. Define the situation or behavior.
    c. Explain behavior in order to offer better solutions to the problem.
    d. Understand the underlying issues related to a problem.
29. When you design a research project in order to interpret your data and explain relationships, you are using
    a. Descriptive methods.
    b. Empirical methods.
    c. Experimental methods.
    d. Inferential methods.
30. Nonexperimental methods
    e. Include the use of observation, interview, and/or surveys.
    f. May use any sample available.
    g. Obtain causative data.
    h. Use simulation and manipulation of certain variables.
31. When you want to determine a cause and effect relationship, you should employ the
    i. Correlational approach.
    j. Experimental approach.
    k. Nonexperimental approach.
    l. Regression approach.
32. If you want a great deal of control in your study, you should conduct a
    m. Correlational study.
    n. Field experiment because there is higher realism.
    o. Lab experiment.
    p. Simulation study.

Understand what types of ethical behaviors are required for research. (section 2.6)

33. The need for informed consent in research with human participants comes from the
    a. Belmont Principles.
    b. Nuremberg Code.
    c. Principle of Competence
    d. Tuskegee Syphilis Study
34. A manufacturer of child safety restraints asks you to test whether the restraints are perceived to be easy to use and effect. You happen to be on the board of directors for this manufacturer. This is an example of
    a. Conflict of interest.
    b. Cost / benefit analysis.
    c. External validity.

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d. Informed consent.

35. You ask students to complete your usability research project for a new online learning tool. This is
    a. Deceptive.
    b. Minimal risk.
    c. Risky.
    d. Worthwhile, regardless of the cost.

Short answer

1. Describe what the scientific method is.
2. Describe the pros and cons of basic and applied research
3. Describe the main difference between nonexperimental and experimental methods of research.
4. Define face, content, construct, and criterion-related validity.
5. Give an example of a quasi-experiment and explain how it is similar or different to a study and an experiment.
6. Give an example of a conflict of interest in research and how it should or could be resolved.
7. Describe the difference among within, between, and mixed designs.
8. Describe the difference between descriptive and inferential methods.

Essay

1. You want to develop and test the use of toys for children. Describe how you would design this project. Be sure to specify what type of research this is, what your variables are, and how you will handle issues related to the IRB and informed consent such as the use of vulnerable groups, cost/benefit ratio, and debriefing.
2. In your research you must assess individual's perceptions of a new building design and the displays used for wayfinding. Explain how you would design ways to test these perceptions, and how you would test for reliability and validity. Be sure to justify your response.
3. To learn more about distracted drivers, you plan to use simulations. Explain how you will establish hypotheses, what would be reasonable independent and dependent variables, and how you would operationalize those variables. Finally, discuss the generalizability of your findings and what factors impact the generalizability.

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