

## **CHAPTER 2: Research Designs and Ethical Issues**

### **MULTIPLE CHOICE**

1. A researcher compared the bone density of a group of 40-year-old women to a group of 65-year-old women and found a significant difference. This is an example of which type of effect?
- a. age effect
  - b. cohort effect
  - c. time of measurement effect
  - d. cross-sectional effect

ANS: A

RAT: An age effect is a difference that is the consequence of growing older.

REF: p. 29 Research Designs to Study the Process of Aging

BLM: Bloom's Taxonomy: Understand

2. A researcher conducting a longitudinal study finds that older adults who were raised during the Depression in the 1930s spent less money on food each week than a group of older adults who were raised after the Depression ended. This is an example of which type of effect?
- a. age effect
  - b. cohort effect
  - c. time of measurement effect
  - d. cross-sectional effect

ANS: B

RAT: A cohort effect is a difference that results from being born at a specific time period.

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BLM: Bloom's Taxonomy: Understand

3. Dr. Ellis is planning to collect data from 40-, 60-, and 80-year-olds this coming January to study age differences. This is an example of which type of design?
- a. cross-sectional design
  - b. longitudinal design
  - c. sequential design
  - d. case study design

ANS: A

RAT: A cross-sectional design involves taking a "slice" of the population at the same point in time.

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BLM: Bloom's Taxonomy: Understand

4. Which type of design has the advantage of allowing a researcher to compare different age groups at a single point in time?

- a. cross-sectional design
- b. longitudinal design
- c. sequential design
- d. case study design

ANS: A

RAT: A researcher who uses a cross-sectional design acquires data from multiple age groups all at once.

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BLM: Bloom's Taxonomy: Understand

5. Which of the following is an advantage of a cross-sectional design?

- a. low cost
- b. detects age changes
- c. eliminates cohort effects
- d. eliminates time of measurement effects

ANS: A

RAT: Cross-sectional designs involve collecting data from one set of individuals at one point in time. Because fewer data are collected these studies have the advantage of being relatively inexpensive.

REF: p. 29 Research Designs to Study the Process of Aging

BLM: Bloom's Taxonomy: Remember

6. Dr. Klein is using a cross-sectional design to study happiness at different ages. Which of the following is something that Dr. Klein will need to consider when analyzing her data?

- a. age effects
- b. practice effects
- c. cohort effects
- d. maturation effects

ANS: C

RAT: Cohort effects can arise in cross-sectional designs because each age group is part of a different cohort.

REF: p. 29 Research Designs to Study the Process of Aging

BLM: Bloom's Taxonomy: Apply

7. A researcher uses a cross-sectional design and compares the height of women aged 30 through 90. The researcher finds that younger women are much taller than older women in the study.

This finding exemplifies which of the following?

- a. age effect

- b. age difference
- c. maturation effect
- d. attrition

ANS: B

RAT: Cross-sectional designs do not allow for a comparison of the same people over time, therefore only age differences are revealed in this research. Maturation effects and attrition are phenomena associated with longitudinal designs.

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BLM: Bloom's Taxonomy: Apply

8. Dr. Reinhart has been surveying the same group of people every 5 years for the last 25 years. Dr. Reinhart's research is an example of which type of design?

- a. cross-sectional design
- b. longitudinal design
- c. sequential design
- d. case study design

ANS: B

RAT: A longitudinal design is a research design that involves collecting data from the same people at two or more points in time.

REF: p. 29 Research Designs to Study the Process of Aging

BLM: Bloom's Taxonomy: Apply

9. Which of the following is an advantage of using a longitudinal design?

- a. it allows for the assessment of cohort effects
- b. it is less expensive than other methods
- c. it minimizes practice effects
- d. it allows for the assessment of age changes

ANS: D

RAT: Longitudinal designs involve collecting data from the same people as they age, which allows for the assessment of age changes.

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BLM: Bloom's Taxonomy: Remember

10. Dr. Archambault is conducting a longitudinal study with the hopes of determining whether hand-eye coordination is affected by aging. Dr. Archambault has his participants complete the same computer-based hand-eye coordination test every year for ten years. Which of the following may threaten the validity of Dr. Archambault's study?

- a. age differences
- b. age effects
- c. practice effects

d. cohort effects

ANS: C

RAT: When the same test is used repeatedly in longitudinal designs the participants may improve because of practice, which reduces the validity of any differences observed over time.

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BLM: Bloom's Taxonomy: Apply

11. Dr. Patel is conducting a longitudinal study and has discovered high rates of attrition. What does this mean?

- a. participants' test scores are improving over time
- b. participants are dropping out of the study
- c. the findings will not be generalizable to the real world
- d. participants are exhibiting time of measurement effects

ANS: D

RAT: The term attrition refers to the loss of participants in a longitudinal study.

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BLM: Bloom's Taxonomy: Understand

12. Which of the following is a threat to external validity in a longitudinal design?

- a. attrition
- b. uniqueness of the study environment
- c. practice effects
- d. cohort effects

ANS: B

RAT: When the study environment is unique and differs from real world settings the results may not be generalizable.

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BLM: Bloom's Taxonomy: Remember

13. What type of research design was used in the Nun Study discussed in the text?

- a. cross-sectional
- b. longitudinal
- c. case study
- d. sequential

ANS: B

RAT: The Nun Study involved testing the same nuns at different points in time; it therefore used a longitudinal design.

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BLM: Bloom's Taxonomy: Remember

14. Dr. Panasiuk would like to conduct a study on aging that separates cohort effects from age effects. What type of design should she use?

- a. cross-sectional
- b. longitudinal
- c. cohort-sequential
- d. case study

ANS: C

RAT: Because different cohorts are studied over time a sequential design allows a researcher to separate cohort effects from age effects.

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BLM: Bloom's Taxonomy: Understand

15. Dr. Rhee conducted a study in which she assessed preventive health practices of two cohorts (1940 and 1950) at two different ages (60 and 70). Dr. Rhee examined her results and concluded with confidence that changes in preventive health practices were part of the normal aging process. What must Dr. Rhee have observed in her data?

- a. significant differences between the two cohorts but no significant differences between the two ages
- b. significant differences between the two cohorts and significant differences between the two ages
- c. no significant differences between the two cohorts and no significant differences between the two ages, but a significant interaction between cohort and age
- d. no significant differences between the two cohorts and significant differences between the two ages

ANS: D

RAT: Dr. Rhee could not have found a significant difference between cohorts because she was confident that the difference was due to normal aging. An interaction between cohort and age would have led to a more complicated interpretation. Therefore Dr. Rhee must only have found a significant effect of age when she analyzed her data.

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BLM: Bloom's Taxonomy: Apply

16. A key feature of a time-sequential design is that it isolates which of the following effects?

- a. age and time of measurement
- b. time of measurement and cohort
- c. cohort and practice
- d. practice and age

ANS: B

RAT: The time-sequential design compares multiple cross-sectional samples at multiple points

in time, which allows for both cohort and time of measurement effects to be isolated.

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BLM: Bloom's Taxonomy: Understand

17. Dr. Allen used a cross-sequential design to study changes in eating habits with age. When he attempted to publish his results, several reviewers identified a major confound in his study that occurred between which of the following?

- a. age and time of measurement
- b. time of measurement and cohort
- c. cohort and eating habits
- d. eating habits and age

ANS: A

RAT: Cross-sequential designs involve measuring several cohorts at different points in time; however, this method results in difficulty determining if observed differences are the result of aging or a result of something specific to the time and place of the assessment.

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BLM: Bloom's Taxonomy: Apply

18. What type of design must be used when a researcher wants to separate age and time of measurement effects?

- a. cohort-sequential
- b. time-sequential
- c. cross-sequential
- d. cross-sectional

ANS: B

RAT: Because the time-sequential design compares at least two cross-sectional samples at two or more points in time, it is possible to separate age effects and time of measurements effects when analyzing the data.

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BLM: Bloom's Taxonomy: Remember

19. Dr. Van Hal is specifically interested in looking at age differences in internet use and wants to conduct the least expensive study possible. Which of the following methods should he use?

- a. cross-sectional
- b. time-sequential
- c. cross-sequential
- d. cohort-sequential

ANS: A

RAT: A cross-sectional study would be both cost effective and useful for examining age differences.

REF: p. 29 Research Designs to Study the Process of Aging  
BLM: Bloom's Taxonomy: Apply

20. Which of the following ethical issues is MOST closely linked to research involving people with Alzheimer's disease?

- a. confidentiality
- b. anonymity
- c. the right to withdraw
- d. informed consent

ANS: D

RAT: People with Alzheimer's disease lack the capacity to decide for themselves whether to participate.

REF: p. 36 Informed Consent

BLM: Bloom's Taxonomy: Remember

21. Hugh is 80 years old and has been offered a large sum of money to participate in a study examining the effects of exercise on the body at different ages. Hugh feels compelled to participate because he has very little income. Which ethical principle is being undermined in this scenario?

- a. confidentiality
- b. voluntary participation
- c. the right to withdraw
- d. anonymity

ANS: B

RAT: The large financial incentive may make Hugh feel like he has no choice but to participate, which negates the ethical principle of voluntary participation.

REF: p. 36 Informed Consent

BLM: Bloom's Taxonomy: Apply

22. Edith's physician has been supplying her with free samples of a medication that she could not otherwise afford to buy. The physician asks Edith to participate in a research study that he is conducting, suggesting that he will continue to give Edith the free samples only if she complies. Which of the following BEST describes the physician's behaviour?

- a. coercion
- b. undue influence
- c. a breach of confidentiality
- d. standard recruitment practices

ANS: A

RAT: The physician is threatening Edith's health in order to get her to participate, which is a form of coercion.

REF: p. 36 Informed Consent

BLM: Bloom's Taxonomy: Apply

23. What role do proxies play in research involving older adults?

- a. they provide consent
- b. they ensure confidentiality
- c. they ensure anonymity
- d. they provide compensation

ANS: A

RAT: A proxy can serve as a substitute decision maker when a participant lacks the capacity to understand informed consent.

REF: p. 36 Informed Consent

BLM: Bloom's Taxonomy: Remember

24. What does it mean when a researcher indicates their data are confidential?

- a. they are not collecting identifying information about the participants
- b. they are not linking individual responses with participants' identities
- c. only the researcher will have access to the data
- d. the data will be destroyed when the research is complete

ANS: C

RAT: Confidentiality refers to who can access the data, while anonymity refers to what is in the data itself. If a researcher promises confidentiality this means that only the researcher or research team will be able to access the data.

REF: p. 37 Confidentiality of Data

BLM: Bloom's Taxonomy: Understand

25. When researchers studied the main issues raised by ethics review boards assessing proposals for research involving people with dementia, which of the following was MOST often cited as a concern?

- a. participant vulnerability
- b. participant burden
- c. data access
- d. study methodology

ANS: A

RAT: The study revealed that patient vulnerability was raised as a concern for 58.6% of research proposals, which is more than any of the other items listed.

REF: p. 37 Confidentiality of Data

BLM: Bloom's Taxonomy: Remember



26. A researcher is conducting a longitudinal study on helping behaviours among older adults in Alberta. Every five years each participant completes a survey related to volunteer work and charitable donations. The researcher collected data in 2016, a year when a wildfire destroyed Fort McMurray, Alberta, and many people in the province donated their time and money to help those affected. What might the fire introduce to the research study?

- a. age effect
- b. time of measurement effect
- c. maturation effect
- d. practice effect

ANS: B

RAT: The fire may make participants more likely to perform helping behaviours, which could introduce a time of measurement effect to the data.

REF: p. 29 Research Designs to Study the Process of Aging

BLM: Bloom's Taxonomy: Apply

27. Which of the following can never be a true independent variable in a research design?

- a. age
- b. activity level
- c. diet
- d. medication dose

ANS: A

RAT: Because age cannot be randomly assigned it can never be a true independent variable.

REF: p. 29 Research Designs to Study the Process of Aging

BLM: Bloom's Taxonomy: Understand

28. The Nun Study provided researchers with new and valuable information regarding the developmental pattern of which disease?

- a. Parkinson's disease
- b. Huntington disease
- c. cardiovascular disease
- d. Alzheimer's disease

ANS: D

RAT: The Nun Study allowed researchers to examine the writing of nuns who later developed Alzheimer's disease.

REF: p. 29 Research Designs to Study the Process of Aging

BLM: Bloom's Taxonomy: Remember

29. Marge's daughter-in-law signed Marge up to participate in a research study examining the effect of age on a person's vocabulary. Marge is very shy and would not have chosen to participate on her own, but complies because she doesn't want to have a disagreement with her daughter-in-law. This is an example of which of the following?

- a. coercion
- b. undue influence
- c. a breach of confidentiality
- d. a breach of anonymity

ANS: B

RAT: Marge did not participate by her own free will; however, because her health and safety were not being threatened this was an act of undue influence not coercion.

REF: p. 36 Informed Consent

BLM: Bloom's Taxonomy: Apply

30. What are the three core principles of the TCPS-2?

- a. concern for welfare, justice, and compensation
- b. respect for persons, concern for welfare, and justice
- c. justice, compensation, and respect for persons
- d. compensation, respect for persons, and concern for welfare

ANS: B

RAT: The TCPS-2's three core principles are respect for persons, concern for welfare, and justice.

REF: p. 37 Confidentiality of Data

BLM: Bloom's Taxonomy: Remember

## ESSAY QUESTIONS

1. Describe a cross-sectional research design, including an example of this design as well as a description of advantages and disadvantages associated with cross-sectional designs.

ANS: Student answers should include the following:

-a cross-sectional design involves studying people of different ages at the same point in time

-for example, a researcher may recruit people who are 50, 55, 60, and 65 and ask them to complete a survey relating to their social activities

-advantages of a cross-sectional design include: low cost, fast data collection, and the ability to examine many variables from different age groups/cohorts at the same time

-disadvantages of cross-section designs include: being able to detect age differences but not age changes, impossible to determine if differences between groups are cohort effects or age effects

REF: p. 29 Research Designs to Study the Process of Aging

2. Describe a longitudinal research design, including an example of this design as well as a description of advantages and disadvantages associated with longitudinal designs.

ANS: Student answers should include the following:

- a longitudinal design involves collecting data from the same people using the same measures at at least two points in time
- for example, a researcher may recruit a group of 50-year-olds and administer a survey about their social activities when these individuals are 50, 55, 60, and 65.
- advantages of longitudinal designs include: ability to study age changes, and reduced risk that any observed changes are due to cohort effects
- disadvantages of longitudinal designs include: problems separating maturation effects from time of measurement effects, expense, time commitment, practice effects, attrition, and poor external validity

REF: p. 29 Research Designs to Study the Process of Aging

3. Describe three different types of sequential designs, provide an example of each, and describe the advantages and disadvantages of each of these designs.

ANS: Student answers should include the following:

- cohort-sequential: involves two or more cross-sectional studies done at two or more time periods.
  - for example, a researcher could administer a survey to a sample of 50- and 60-year-olds and then administer the same survey to 50- and 60-year-olds 10 years later and 20 years later, collecting data from previous participants who meet the age criteria at each point in time
  - advantages include: being able to distinguish age effects from cohort effects
  - disadvantage: not possible to determine time of measurement effects
- time-sequential: compares two or more cross-sectional samples at two or more points in time.
  - for example, a researcher may recruit 50-, 55-, and 60-year-olds and administer them a survey in 2017 and 2022, then recruit 50-, 55-, and 60-year-olds and administer them a survey in 2019 and 2024
  - advantages include: can separate out age and time of measurement effects
  - disadvantages include: cohort and time of measurement are confounded
- cross-sequential: compares a cross-sectional sample at two or more points in time
  - for example: a sample of 50-, 55-, and 65-year-olds may be surveyed in 2017 and then the same people could be surveyed in 2022, 2027, and 2030
  - advantages include: can eliminate age as a factor if desired
  - disadvantages include: age effects and time of measurement effects are confounded

REF: p. 29 Research Designs to Study the Process of Aging

4. Define informed consent and discuss three issues that can compromise informed consent in older adults.

ANS: Student answers should include the following:

- informed consent is an indication of agreement by an individual to become a participant in a research project
- informed consent can be compromised in older adults if there is undue influence or coercion, financial incentives that are difficult to decline, or issues with their ability to make decisions

REF: p. 36 Informed Consent

5. Discuss the results of the study by Pachana and her colleagues that examined the experiences of researchers submitting ethics proposals for research involving older adults with or without dementia.

ANS: Student answers should include the following:

- the main issues brought up by the ethics review boards were consent and information requirements, participant vulnerability, participant burden, data access, and study methodology
- the main points reported by the researchers revolved around restrictions and delays that made it difficult to retain participants and study the issues most important to the cohort (such as dementia). In addition, researchers suspected that some members of ethics review committees held negative stereotypes of older adults (such as all older adults are vulnerable), which led to their objections to various research studies.
- a suggestion by Pachana was to educate research boards on ageism and to remind members of ethics boards that not all adults are in poor cognitive or physical health.

REF: p. 37 Confidentiality of Data