
TEST BANK
IMAGE
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SOON

Chapter 2

Research Techniques: Observation and Correlation

Chapter Outline

Key Terms

anthropomorphizing
case study
cause
confounding
contingency research
correlation coefficient
correlational research
cross-lagged-panel correlation procedure
delimiting observations
deviant-case analysis
ethogram
ethology
ex post facto research
naturalistic observation
negative correlation
participant observation
Pearson's product-moment correlation coefficient, or Pearson r
positive correlation
reactivity
relational research
restriction of range
survey
unobtrusive measures
unobtrusive observations
variable
χ^2 test for independence

Answers to Discussion Questions

1. Behaviors that a mother might exhibit regarding the baby that are independent of the baby's immediate needs are talking, smiling, eating, sleeping, crying, doing laundry, reading, and cooking. Some behaviors that an infant might engage in when the parent is not attending to the baby are cooing, smiling, babbling, crawling, crying, sleeping, playing, teething, and watching the parent or other family members. Some behaviors that might occur when the mother and child are together are feeding, holding, talking, playing, crawling, crying, sleeping, and smiling. Observations made of both the mother and the child for five hours a day over several weeks would yield the frequency with which each behavior occurred when they were together and when they were apart. These observations would allow us to determine what behaviors occur more often, and what behaviors are more likely in each of these situations, but they do not allow us to draw any causal conclusions about why these behaviors occur. For example, we might observe that this infant cries less when the mother is present, but we could not conclude that the baby cries less because the mother is nearby.

2. a) In general, death rates from cancer tend to be higher for countries in which larger numbers of cigarettes are purchased.

   b) When graphed, the pattern suggests that there is a positive correlation between cigarette consumption in 1930 and cancer deaths in 1950.

   c)
   $$r = \frac{(11)(1691400) - (6640)(2260)}{[(11)(5440400) - (6640)2][(11)(601800) - (2260)2]}$$

   $$r = .737$$

3. No. The existence of a correlation between two variables can never be taken as evidence that changes in one variable cause changes in the other, even if there is a perfect correlation between the two. In this case, it is possible that smoking cigarettes causes cancer, but it is also possible that something else (e.g., stress) causes both an increase in smoking and an increase in cancer. That would result in a positive correlation between smoking and cancer deaths in the absence of a direct causal relationship between them.

4. Some variables that might be highly correlated without being causally related might include:
   a) age and number of blue jeans owned
   b) yearly income and number of credit cards used
   c) number of heatstroke victims and ice cream consumption
   d) amount of beer consumed and rock-n-roll album sales
   e) gasoline consumption and number of little league games in a given month

   There are several more complex correlational procedures that allow researchers to uncover possible causal connections among variables. These include the cross-lagged-panel correlation procedure, multiple regression, partial correlation, and path analysis.

Lecture Suggestion

There are relatively few examples of the use of participant observation in psychological research. However, there are two that stand out as good examples of the ways in which observational research can stimulate both theoretical development and additional research under controlled conditions. Although these are older studies, both are classics in their own right and provide for fertile discussions about the benefits and limitations of observational research. One of these is the study of the group called the Seekers and is discussed briefly in the text (Festinger, Riecken, & Schacter, 1956). In this study, several researchers presented themselves to the group as individuals interested in UFOs and joined the group shortly before the date of the catastrophe they predicted. This study allows for an interesting and thorough discussion of such issues as reactivity, observer bias, methods of recording observations, and the sheer volume of information generated using the method of data collection employed (i.e., narrative accounts written as soon as possible after the events observed). Many of these issues are discussed by the authors in the Methodological Appendix in their book. In addition, one can see the clear roots of the laboratory research on cognitive dissonance in their account of the responses of the Seekers to the disconfirmation of their prophecy. This provides a good example of a hypothesis derived from observational research and tested under more controlled conditions in the laboratory.

Another example of participant observation is the study by Rosenhan (1973). In this study, seven researchers presented themselves to several psychiatric hospitals around the US complaining of symptoms of a condition that was included in the Diagnostic and Statistical Manual in use at that time, but was considered rare. Once admitted, the observers recorded the ways in which the hospital staff interacted with them as patients. This research stimulated a great deal of discussion and debate about the possible effects of being labeled as a psychiatric patient on the ways in which psychiatric patients were treated.

References

Festinger, L., Riecken, H. W., & Schacter, S. (1956). When prophecy fails: A social and psychological study of a modern group that predicted the destruction of the world. NY: Harper & Row.

Rosenhan, D. L. (1973). On being sane in insane places. Science, 179, 250-258.

Demonstration Suggestions

1. Have everyone in the class give an estimate of the distance in miles from their homes to the university campus. Then have them give an estimate of the number of times they visit their homes during a semester. After collecting this information, have each student work through the exercise of computing a Pearson Product Moment correlation coefficient for these data. Chances are that there will be a negative correlation between the two measures. That is, the further away a student lives, the less likely he or she is to make trips home during the semester. Discuss the outcome with the class. This particular example is interesting because students will likely wish to postulate a causal relationship between the two variables even though such a conclusion should not be drawn from correlational data.

2. Because demonstrations of correlation can be difficult when the class size is small, here is an alternative that is possible to do either in a lab section or over two class sessions. Have the students in the class design and run a small-scale correlational study. Provide the students with a short, existing measure of some psychological characteristic (e.g., stress, optimism, self esteem) and have them discuss variables that might be related to that characteristic (e.g., exercise, involvement with extracurricular activities). Have the class, as a group, create a measure of that variable by generating a set of questions and turning them into items that can be responded to on a Likert scale. They can then give their questionnaire to a convenience sample of students on campus, score their measure, and calculate the correlation coefficient. This activity illustrates the challenges of creating measures of naturally occurring variables and interpreting the results of a correlational analysis.

Experimental Dilemmas

1. A social psychologist interested in the effects of unemployment on alcohol abuse conducted the following study. He mailed questionnaires to the homes of workers who had been laid off from a local automobile plant. The questionnaires were mailed at various time intervals, and the workers were asked to fill them out anonymously and return them. The questionnaires contained items designed to provide information as to the amount of alcohol consumed daily before and after the layoffs occurred. Fifty percent of the participants completed and returned the questionnaires. For those individuals who returned the questionnaires, the researcher found a positive correlation between alcohol consumption and length of unemployment ($r = .87$). That is, the longer the workers were unemployed, the more alcohol they reported consuming. In his report, the researcher stated that "the conditions of unemployment produce a tendency for people to increase their alcohol intake." If you were the editor in charge of deciding whether his work should be accepted for publication, what would your judgment be?

   ANSWER: The work should not be accepted for several reasons. First, the questionnaire was returned by only half of the original sample, so these results should be interpreted with caution. It is possible that there is a systematic difference between those who participated by returning the questionnaire and those who did not, making this a biased sample. Second, the researcher cannot conclude that unemployment causes an intake in alcohol consumption. The existence of a correlation cannot be taken as evidence that changes in one variable (here, length of unemployment) causes a change in the other (daily alcohol consumption). It is possible that something else is responsible for the correlation. Third, this study could have been done using more rigorous controls. One possibility is comparing the unemployed workers to a matched sample of those who still work at the plant. Another would be to measure alcohol consumption before, during, and after their period of unemployment; if unemployment is responsible for an increase in alcohol consumption the researcher should see a decline in alcohol use once the workers return to their jobs.

2. An Australian ethologist has been studying the behavior of kangaroos for the past several months. She discovered a group of kangaroos living approximately 100 miles from her home, and she moved out into the brush area in which they were living. Taking great care to keep a distance of at least 1/2 mile between herself and the animals, the researcher observed their behavior for 97 consecutive days. She tabulated the most frequently observed behaviors and constructed an ethogram from her findings. The behaviors exhibited most often by the kangaroos included eating, hopping, boxing, sleeping, and grooming. She noted different patterns of behavior among males and females and also between adults and young kangaroos. Is there anything wrong with this ethologist's attempts at naturalistic observation?

   ANSWER: No.

QUESTIONS

Answers and text page references for test questions can be found in Appendix C.

Multiple Choice

1. If all the values of one variable are about the same, and the values of a second variable are very different, then the correlation coefficient will approach
   a. 1.0
   b. zero
   c. -1.0
   d. either 1.0 or -1.0

2 The validity of scientific observations is threatened by
   a. reactivity.
   b. errors of observation.
   c. delimiting the choice of behaviors to observe.
   d. all of the these.

3. In naturalistic observation, the observer's presence may make the measures
   a. comparative
   b. error free
   c. correlational
   d. reactive

4. Looking for a relationship between two variables involves the _____ technique.
   a. naturalistic
   b. authoritative
   c. a priori
   d. correlational

5. Correlation coefficients vary from
   a. 0.0 to 1.0.
   b. -1.0 to 0.0.
   c. -1.0 to 1.0
   d. -10.0 to 10.0

6. Deviant-case analysis attempts to minimize
   a. errors of observation.
   b. the difficulties of making inferences.
   c. reactivity.
   d. statistical bias.

7. Which of the following is an example of a negative correlation?
   a. Body weight increases as children get older.
   b. The rate of heart attacks is directly proportional to yearly income.
   c. Shoe size increases as height increases.
   d. The likelihood of owning a baseball card collection decreases with age.

8. _____ occurs when a third factor varies along with one of the variables of interest, making the interpretation of the correlation between the two main variables difficult.
   a. Confounding
   b. Correlation
   c. Confliction
   d. Truncation

9. In making scientific observations, pure objectivity
   a. is only possible with naturalistic observation.
   b. is only possible with experimentation.
   c. is only possible with deviant-case analysis.
   d. is never possible.

10. Low correlations
   a. imply that the two variables are causally related.
   b. are found only with Pearson coefficients.
   c. may be produced by a restricted range of one of the variables.
   d. are seldom observed in psychological research.

11. The correlation coefficient does not indicate
   a. the association between two variables.
   b. the direction of the relationship between two variables.
   c. the effect of one variable on another.
   d. how one factor varies with another.

12. An experimenter computing the correlation between age and memory span would
   a. be able to show that old age produces a decrease in memory span.
   b. be able to determine that a third variable was involved.
   c. make an error because age and memory span are measured on different scales.
   d. be able to determine whether there is a relationship between age and memory span.

13. Assessing the relation between two variables in correlational studies is usually made ex post facto, or
   a. a priori.
   b. before the data are collected.
   c. after the data are collected.
   d. independently of data collection.

14. Before calculating a Pearson correlation coefficient, it is advisable to plot the data because
   a. one must be sure that the underlying relationship between the two variables is linear.
   b. the diagram is more informative than the correlation coefficient regarding causality.
   c. one must make sure that the data are from a truncated range.
   d. the correlation coefficient cannot show the direction of the relationship.

15. Using a cross-lagged-panel correlational procedure, Eron, Huesmann, Letkowitz, and Walder (1972) found evidence which suggests that
   a. watching violent TV programs may produce later aggression.
   b. aggressive people tend to watch nonviolent TV programs.
   c. people who watch violent TV programs when they are young continue to do so all of their lives.
   d. aggressive third graders watch violent TV programs when they grow up.

16. In naturalistic observations, one can guard against reactivity by
   a. making unobtrusive observations.
   b. giving unobtrusive instructions.
   c. making obtrusive measures.
   d. eliminating confounding variables.

17. _____ is inherent in correlational research and leads to interpretational difficulties.
   a. Participant observation
   b. Reactivity
   c. Delimiting observation
   d. Confounding

18. A potential problem threatening the validity of naturalistic observations is that
    a. the observations are never reliable.
    b. the observer is unable to predict the participant's reaction.
    c. the participant may react to being observed.
    d. the observer can not statistically analyze the findings.

19. Naturalistic observation is a valuable procedure in that
    a. it allows for extensive experimental control.
    b. it is easily replicated.
    c. it is primarily descriptive.
    d. it can define a problem area and raise further questions.

20. Which of the following is true?
    a. We can rule out the possible effects of mediating variables in correlational research.
    b. As a correlation coefficient increases, we can be more sure that a causal relationship exists between the two variables.
    c. It is not possible to correlate two variables that have different scales of measurement.
    d. Correlational research cannot demonstrate a causal relationship between two variables.

21. Stating that a kitten is sad because it has been separated from its mother is an example of
    a. naturalistic observation.
    b. confounding.
    c. anthropomorphizing.
    d. a correlation.

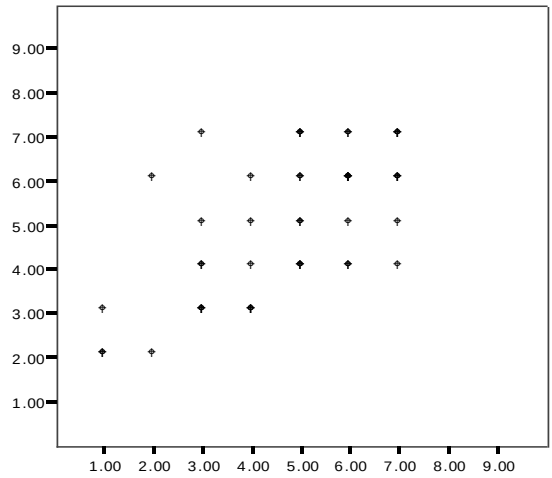
22. In a study of the social interactions of the homeless in a busy railroad station, the researcher poses as a homeless woman and keeps a daily record of all of her interactions with other people, including the homeless, commuters, public officials (e.g., police officers), and those who work in the station. This is an example of
    a. survey research
    b. participant observation
    c. an experiment
    d. archival research

23. A researcher studying productivity among factory workers finds that productivity declines as the outside temperature increases. This is an example of
    a. a negative correlation
    b. a zero correlation
    c. a positive correlation
    d. a confound

24. When doing observational research, recording the behaviors on videotape
    a. eliminates observer bias.
    b. eliminates reactivity.
    c. makes it possible to replicate the study.
    d. provides a way to assess the reliability of the observations.

25. A researcher measures the number of birds belonging to each of 5 different species sighted in a particular nature preserve over a three month period. What kind of research is this?
    a. correlational
    b. experimental
    c. relational.
    d. observational

26. Which of the following correlation coefficients most likely corresponds to the pattern of data shown in the graph below?
    a. 1.00
    b. 0.60
    c. -0.60
    d. 0.10



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27. In a contingency table, the number in each cell of the table is
    a. the number of categories used to classify the participants.
    b. the number of individuals in the sample who are classified in a particular category.
    c. the total number of individuals in the sample.
    d. the number of individuals who would be expected to belong to a particular category by chance.

28. A case study
    a. is an intensive study of a single individual or group.
    b. is a form of observational research.
    c. cannot be used to test a causal hypothesis.
    d. all of the these.

29. Which of the following is not true of survey research?
    a. It eliminates the problem of reactivity.
    b. It is a form of observational research.
    c. It provides descriptive data about a population based on a random sample.
    d. It can suggest hypotheses that can be tested under more controlled conditions.

30. Where there is a restricted range of values for one of two variables being measured
    a. the correlation coefficient will be close to +/- 1.0.
    b. the correlation coefficient may be close to zero even if the two variables are related.
    c. the correlation coefficient will be negative.
    d. the correlation coefficient will be positive.

31. A scatterplot showing the relationship between two variables
    a. provides information about the data that is not reflected in the correlation coefficient.
    b. can reveal problems with the data that may result in spuriously high or low correlation coefficients.
    c. illustrates graphically both the strength and the direction of the relationship between them.
    d. all of these

True-False

1. T / F The X^2 test for independence is a statistical test often used to determine the significance of the relationship between the variables in contingency research.

2. T / F The correlational method provides for better understanding of events than any other scientific method.

3. T / F Naturalistic observation occurs mostly in laboratory settings.

4. T / F Using advanced technology to record events eliminates the possibility of observer bias.

5. T / F One difficulty associated with naturalistic observation of animals is that researchers may anthropomorphize animal behaviors.

6. T / F A positive correlation is observed if the values of one variable decrease as the values of another variable decrease. .

7. T / F If two variables are correlated, one may predict the value of one variable given the value of the other variable.

8. T / F Possible mediation effects prevent the inference of causation from correlation.

9. T / F Confounding is a greater problem in experimental than in correlational research.

10. T / F An assumption underlying the Pearson r is that the relationship between two variables is linear.

11. T / F Correlation allows for more control of extraneous factors than does the experimental method.

12. T / F Descriptive observation involves the recording of facts about natural phenomena.

13. T / F In participant observation, the researcher remains totally uninvolved in the lives of the participants.

14. T / F Contingency research is a relational research design in which the frequencies of all combinations of two variables are assessed to determine the relationship between the variables.

15. T / F In correlational studies, a number of factors may vary together, so that the results are confounded.

16. T / F In participant observation, a research participant observes other participants so that the experimenter's preconceived notions do not contribute to observation error.

17. T / F Unobtrusive measures are indirect observations of behavior conducted ex post facto.

18. T / F Relational research attempts to determine how two or more variables are related to each other.

19. T / F A negative correlation occurs when the increase in the value of one variable is associated with a corresponding decrease in another variable.

20. T / F A Pearson r can have a value of -.99.

21. T / F The validity of scientific observations can be threatened by reactivity.

22. T / F When making scientific observations, pure objectivity is possible only with deviant-case analysis.

23. T / F The Pearson correlation coefficient is useful only for nonlinear data.

24. T / F Naturalistic observation is a valuable procedure in that it can help to define a problem area and raise further research questions.

25. T / F A variable can be manipulated but not measured.

Essay Questions

1. Describe a real life situation where two variables are related nonlinearly.

2. Describe three different research techniques and outline the advantages and disadvantages of each of them.

3. Describe a real life problem that is difficult or impossible to examine with the experimental method. What method would you use to investigate this problem?

4. A scientist is interested in investigating the claim that talking on a cell phone while driving increases the risk of having an accident. Describe how this study might be done using an observational method, a correlational method, and an experimental method. Which method do you think is best and why?

5. Set up a hypothetical contingency table that describes the relationship between young and older adults in some domain of interest. Try to make your table reflect what you think is the true state of affairs. Describe the relationship shown in your contingency table.

6. Describe a situation where naturalistic observation would be an ideal method to use. What are the positives and negatives of using this method for the situation you describe.

7. Give an example of a situation in which the cross-lagged-panel correlational procedure would be appropriate.

8. A researcher is interested in seeing whether early exposure to certain FDA approved food preservatives has a negative impact on the cognitive development of children. Clearly a controlled laboratory experiment would be difficult, if not impossible, to do and raises some ethical issues as well. What kind of study could be done that might provide evidence for a possible causal relationship between ingestion of food preservatives and cognition. Describe briefly how this study might be done.

9. A psychologist finds a significant negative correlation between Body Mass Index (BMI) and self esteem among adolescents in the US. Can we conclude that a high BMI is damaging to self esteem? Why? Offer two alternative interpretations for this correlation.