Review Session

Review

- Four types of variables:

  nominal ordinal interval ratio

  score

- Values of variables are distributed
  - Important goal: characterizing the distribution
- Graphs
  - Bar graphs for nominal variables
  - Histograms for score variables
- Normal versus non-normal distributions
  - Skewed, bimodal, etc.

Clicker Question

Which of the following is NOT true of a normal distribution?

A. It has one peak
B. Scores diminish as one moves further from the mean
C. The median is a better indicator of central tendency than the mean
D. Scores are equally distributed around the mean

Review – 2

- Two principal measures of distributions
  - Central tendency
    - Mean, median, mode
  - Variability
    - Range, variance, SD
      - 1 SD includes approx. 68% of scores
      - 2 SD includes approx. 95% of scores
      - 3 SD includes approx. 99% of scores

Review - 3

- Population and samples
  - From studying the distribution in a sample, one can estimate the distribution in the actual population
  - Mean of actual population will
    - Fall within one SD of mean of sample 68%
    - Fall within two SD of mean of sample 95%
    - Fall within three SD of mean of sample 99%
  - Larger sample yields smaller SD and hence more precise estimate
  - Hence, to improve the precision of an estimate, use a larger sample

Clicker Question

Your laboratory has chosen a sample of 1000 individuals to study. A new assistant suggests you should sample at least 10% of the actual population of 25 million (2.5 million). You should

A. Point out to the assistant that accuracy depends on sample size, not percentage sampled
B. Promote the assistant for improving the laboratory's research
C. Point out to the assistant that sample size only affects the median, not the mean
D. Point out to the assistant that the SD will increase if you sample a larger population

Clicker Question

Jing is performing an observational study in which he records the percentage of men at different fast food restaurants. Jing is employing

a. situation sampling.
b. time sampling.
c. event sampling.
d. continuous sampling.

Clicker Question

What would demonstrate that earning a degree in business is not sufficient for getting a high-paying job?

A. Someone who didn't get a degree in business and got a high-paying job

B. Someone who didn't get a degree in business and did get a high-paying job

C. Someone who did get a degree in business and did get a high-paying job

D. Someone who did get a degree in business and did not get a high-paying job

Clicker Question

Which of the following is a contingent statement?

A. If it is raining, then it is raining.
B. It is raining but it is not raining.
C. It is raining or it is not raining.
D. It is raining or it is snowing.

Clicker Question

A valid argument with false premises

A. must have a false conclusion.
B. must have a true conclusion.
C. may have a true conclusion.
D. may still be sound.

Clicker Question

The statement “If today is Saturday, then there is a party” is false when

A. Today is Wednesday and there is a party.
B. Today is Wednesday and there is no party.
C. Today is Saturday and there is a party.
D. Today is Saturday and there is no party.

Clicker Question

"The basket is full unless the price is high" is logically equivalent to

a. If the price is high, then the basket is full.
b. If the price is high, then the basket is not full.
c. If the basket is not full, then the price is not high.
d. If the basket is not full, then the price is high.

Clicker Question

Which of the following four statements is not logically equivalent to the others?

a. Unless the stock fails, the President won't be fired.
b. If the President is fired, then the stock fails.
c. If the stock fails, then the President is fired.
d. The President is fired only if the stock fails.

Clicker Question

The dogs are barking. If the wind is howling, then the dogs bark. So the wind is howling.

a. Modus ponens
b. Modus tollens
c. Affirming the consequent
d. Denying the antecedent

e. Valid

f. Invalid

Discuss

1. What aspect of perception is illustrated by the drawing on the left? What challenge does this pose to scientists? Explain in some detail.

Discuss

Most native Japanese speakers who have grown up in Japan cannot distinguish between the “l” sound and the “r” sound. How might the fact that neither sound appears in Japanese explain this fact? How, nonetheless, might your roommate, a native Japanese speaker who grew up in Japan appear to distinguish perfectly between these letters in words you use in conversation with her?

Discuss

Why is it important to plan carefully the coding system that will be used in an observational study? What can go wrong if one has a poorly designed coding system?

Clicker Question

For classifying furniture, the categories dining table, desk chair, sofa, lamp, are

a. exhaustive and exclusive
b. exhaustive but not exclusive
c. exclusive but not exhaustive
d. neither exclusive nor exhaustive

Clicker Question

Jane Goodall's decision to use binoculars in her research on chimpanzees in Gombe National Park presumably reflected her concern with:

a. reliability
b. reactivity
c. observer bias
d. artifactual results

Clicker Question

When a nominal variable is expressed in terms of numbers, it uses the numbers

a. only as names
b. to specify rank ordering
c. to quantify differences between items
d. to specify ratios between items

Clicker Question

What category needs to be added to the categories made in the USA, made in China, made in Japan, made in Europe to make them exhaustive categories for cars:

a. made in Korea
b. all of the above
c. made somewhere else
d. made in multiple countries

Clicker Question

Which of the following is the most appropriate strategy for reducing observer bias?

a. only employ observers who are highly knowledgeable about the research

b. employ observers who do not know why the observations are being made

c. use observers who are not financially supporting the research

d. keep the subjects blinded as to the goals of the study

Clicker Question

3. In a study designed to identify people's favorite number, the variables 0, 1, 2, 3, . . . are

a. ratio variables.
b. nominal variables.
c. score variables.
d. ordinal variables.

Clicker Question

4. Which of the following sets of variables could be ratio variables?

a. stars awarded to restaurants
b. temperature in degrees Fahrenheit
c. number of political phone calls received per day
d. numeric code for major in college

Clicker Question

Jing is performing an observational study in which she records her cat's behavior every time a guest enters her apartment. Jing is employing

a. continuous sampling.
b. event sampling.
c. time sampling.
d. situation sampling.

Sue wants to study the behavior of city bus drivers while they are actually driving a bus. She randomly selects five routes to observe twice a day (once during a rush-hour and once during a non-rush-hour time) every day for one week. She plans to board each bus and sit where she can observe the driver but be discreet in recording her data. She divides her observations into six categories: Talking with passengers, job-related communication (e.g., with controllers and other bus drivers via intercom), making announcements, singing, neither talking nor singing, and other. For each trial, Sue plans to use these categories to record her observations for one thirty minute interval not including time where the bus is at a complete stop.

Sue is planning to conduct

a. an experimental study.
b. a participation study.
c. a naturalistic observation study.
d. a structured observation study.

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By observing multiple routes on different days and at different times, Sue is employing

a. time sampling.
b. situation sampling.
c. event sampling.
d. truncated sampling.

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The variable Sue is using to encode the bus drivers' behavior is

a. nominal.
b. ordinal.
c. interval.
d. ratio.

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Sue's study has a high risk of suffering from

a. observer bias.
b. reactivity bias.
c. anthropomorphism.
d. none of the above.

When she performs her study, she reports that during the ten 30 minute recording periods, the mean time making announcements was 135 seconds with a standard deviation of 60 seconds. From this you can conclude

a. approximately 68% of drivers in the study spent between 75 seconds and 195 seconds making announcements.

b. very few drivers spend more than 300 seconds/half hour making announcements.

c. the mean number of seconds for all bus drivers could be estimated, with 95% accuracy, to be between 15 and 255 seconds.

d. all of the above