

Exam 1, Statistics 110

Spring 2002

Multiple Choice — Circle the correct answer for each question. No partial credit will be given. Each question is worth 1 points.

- It is hard to measure "intelligence." Let's do it the easy way: measure height in inches, and call the result "intelligence." Not only is this method easy, it gives the same number every time we repeat the measurement on the same person. Measuring intelligence this way is
 - not reliable and not valid.
 - highly reliable but not valid.
 - valid, but not reliable.
 - both valid and highly reliable.
- Professor Ziegenfuss of the Geology Department has ordered a new instrument which is supposed to measure the iron content of iron ore. After the instrument arrives, he uses it to measure the iron content of five test samples of ore, all of which are known to be exactly 16% iron. The numbers given by the machine on these five test samples are 5%, 3%, 28%, 16%, and 25%. Based on these measurements, one can conclude that the new instrument
 - is biased.
 - is not reliable.
 - suffers from the placebo effect.
 - is confounded.
 - Both (B) and (C).
- A dishonest butcher has a scale on which he weighs the meat his customers buy. In order to increase his profits, he has doctored the scale so that it always reads very close to 10 percent more than the actual weight. The measurements from this scale are
 - biased and unreliable
 - biased and reliable
 - unbiased and unreliable
 - unbiased and reliable
- When several treatments are to be compared, a randomized block experiment is often more effective than a completely randomized experiment because
 - Blocking allows smaller sample sizes to be used.
 - Blocking can reduce extraneous variations in subjects.
 - Blocking helps to confound extraneous and treatment effects.
 - Blocking increases variability in subjects.
 - Blocking always reduces experimental costs.
- We divide the class into two groups: first year students and others. We then take random samples from each group. This is an example of
 - simple random sampling
 - clustered sampling
 - multistage sampling
 - stratified random sampling
 - systematic random sampling
- In a(n) _____ the environments of the subjects are controlled or manipulated by the researcher.
 - stratified sample
 - experiment
 - observational study
 - sample survey
- A typical opinion poll uses a sample size between 1000 and 1500 people. The Current Population Survey samples 50,000 households every month to gather data on employment and unemployment. The main advantage of the much larger sample is
 - there is less bias in a large random sample.
 - a large random sample has a smaller margin of error.
 - a larger random sample allows use of stratified sampling.
 - nonsampling errors are smaller in a large random sample.
- A quality control inspector on an assembly line making microwave ovens randomly chooses one of the first ten ovens manufactured each day. This oven and every tenth oven thereafter gets inspected. This is called
 - a block design.
 - a completely randomized design.
 - simple random sampling.
 - systematic random sampling.
 - stratified random sampling.

9. A farmer wishes to determine which of two brands of baby-pig pellets, Kent or Moormans, produces better weight gains. Two of his sows each give birth to litters of 10 pigs on the same day, so he decides to give the baby-pigs in litter A only Kent pellets, while the pigs in litter B will get only Moormans pellets. After four weeks, the average weight gain for pigs in litter A is greater than the average weight gain for pigs in litter B. The farmer in this story has conducted
- a stratified random sample.
 - a matched pair design.
 - an observational study.
 - an experiment.
 - a double-blind trial.
10. Refer to the previous problem. In the farmer story above, the weight of the pigs after four weeks is
- a parameter.
 - the response variable.
 - the explanatory variable.
 - the placebo effect.
 - stratified.
11. Refer to the previous two problems. The brand of pellets in this story is
- a parameter.
 - the response variable.
 - the explanatory variable.
 - the placebo effect.
 - stratified.
12. Refer to the previous three exercises. In this case, we can't determine if the reason for the advanced growth is due to the type of feed or the genetics of the sow that produced the litter. This is an example of
- bias
 - margin of error
 - response error
 - confounding
 - lack of reliability
13. The student newspaper runs a weekly question that readers can answer online or by campus mail. One question was "Do you think the college is doing enough to provide student parking?" Of the 136 people who responded, 79% said no. When we say that the newspaper poll is biased, we mean that
- repeated polls would miss the truth about the population in the same direction
 - repeated polls would give results that are very different from each other
 - the question asked shows gender or racial bias
 - faculty may have a different opinion from students
14. The margin of error for a poll is 4%. This means that
- 4% of those sampled did not answer the question asked
 - we have 95% confidence that the sample statistic is within 4% of the population parameter
 - 4% of those sampled gave the wrong answer to the question asked
 - 4% of the population were in the sample
 - the confidence we have in the statistic is 4%
15. A sportswriter wants to know how strongly Lafayette residents support the local minor league baseball team, the Lafayette Leopards. She stands outside the stadium before a game and interviews the first 20 people who enter the stadium. The population of interest to the sportswriter is
- all residents of Lafayette.
 - all Leopard fans.
 - all people attending the game the day the survey was conducted.
 - the 20 people who gave the sportswriter their opinion.
 - all American adults.
16. Refer to the previous problem. What type of sample was collected?
- voluntary response
 - convenience
 - stratified
 - systematic
 - simple random sample
17. The New York Times conducted a poll on women's issues in June of 1989. The poll conducted telephone interviews with 1497 adults. These 1497 people make up the
- population.
 - sampling frame.
 - sample.
 - response variable.

18. The term “95% confidence” means
- If we took many samples, the confidence interval would cover the true population result in 95% of them.
 - The sampling frame lists 95% of all American adults.
 - 95% of those interviewed said Yes to the question asked.
 - The confidence interval covers 95% of all responses in the population.
19. Randomization in experimental design is used to
- control for the response variable.
 - avoid confounding.
 - avoid the placebo effect.
 - implement the double-blind technique.
20. Based on 1500 interviews of American adults, 28% of those interviewed oppose capital punishment, we can be 95% confident that the percent of all adults who oppose capital punishment is
- $95\% \pm 3\%$.
 - $28\% \pm 3\%$.
 - 95% of 28%, which is 26.6%.
 - exactly 28%.
21. Refer to the previous problem. The percentage of all American adults that oppose capital punishment is called
- a parameter.
 - a statistic.
 - a population.
 - a sample.
22. Refer to the previous two problems. Which value would you be willing to believe for the true percentage of all Americans who oppose capital punishment?
- 20%
 - 30%
 - 40%
 - 95%
23. An opinion poll asks a sample of 1100 people whether they support reducing the number of legal immigrants to the U.S.; 53% of these 1100 people say yes. The number 53% is a
- margin of error.
 - statistic.
 - bias.
 - parameter.
 - reliability.
24. One source of error in pre-election polls is that some people in the sample say they will vote but later do not vote. This is an example of
- a nonsampling error.
 - a random sampling error.
 - a sampling error, but not a random sampling error.
 - incorrect randomization.
25. You read that drinking moderate amounts of alcohol may reduce the risk of heart disease. To be convinced this is true, you would like to have data from
- a random sample of people with heart disease that asked about their drinking habits.
 - a random sample of people with different drinking habits, followed for several years to compare their future heart disease.
 - a comparison of heart disease rates in countries where people drink lots of wine with countries where people drink little.
 - a randomized comparative experiment in which some people drink moderately and others do not drink at all.
26. Students in a large statistics class were randomly divided into two groups. The first group took the midterm exam with soft music playing in the background while the second group took the exam with no music playing. The scores of the two groups on the exam were compared. This experiment was not double-blind because
- students were allowed to keep their eyes open while taking the exam
 - the exam was too long
 - the students knew whether or not music was playing while they were taking the exam
 - some of the students did not study for the exam
 - students were randomized into the two groups

27. Refer to the previous exercise. The students who listened to music are called the
- (a) block.
 - (b) control group.
 - (c) experimental group.
 - (d) stratified sample.
 - (e) treatment
28. Professional wrestlers decide to sample people to find out what they think of the sport. The wrestlers themselves go to randomly selected addresses and ask the inhabitants questions. They are likely to see
- (a) sampling error.
 - (b) nonrandom sampling error.
 - (c) nonresponse error.
 - (d) response error.
29. To find out how faculty members feel about a new degree program a sample is collected. The process of selecting a faculty member for the sample is as follows: first, a college was randomly selected, then a department within that college was randomly selected, and lastly a member of that department was randomly selected. What type of sample has been taken?
- (a) multistage
 - (b) convenience
 - (c) voluntary response
 - (d) systematic
 - (e) simple random sample
30. In an experiment designed to test the efficacy of a memory enhancing drug, patients were asked to memorize as many digits as possible from a random digit table before and after taking the drug. The experimental design is
- (a) a randomized block design.
 - (b) a simple random sample.
 - (c) a matched pairs design.
 - (d) a completely randomized design.
 - (e) a stratified sample.