STAT 1350, 1/13 Discussion Questions

1. A psychologist wants to know if adults with normal vision can be fooled by a certain optical illusion. She recruits 50 students from her PSY 120 class and finds that 42 of them are fooled by the illusion. The population in this study is

   adults w/ normal vision

2. A 2008 national sample survey interviewed 1007 people age 18 and older nationwide by telephone. One question asked was whether "on the whole, would you say you are satisfied or dissatisfied with the way the nation is being governed?" The population for this sample survey appears to be

   (American) adults

3. In a(n) _____, the environments of the subjects are controlled or manipulated by the researcher.

   experiment

4. The essential difference between an experiment and an observational study is that

   experiments manipulate one of the variables

Can pleasant aromas help people work more efficiently? Researchers did this study to find out. Twenty-two students worked a paper-and-pencil maze six times. On three tries, they wore a mask with floral scents. On the other three tries, they wore a mask with no scent. The six tries were done in random order and each used a different maze. The researchers found that the subjects took less time to complete the maze when wearing the scented mask.

5. What kind of study is this? experiment

6. What is the *population* for this study? people

7. What is the *response variable* for this study? What is the explanatory variable for this study?

   time to complete a maze ; scent of mask

8. A(n) _____ is a subset of subjects from the population.

   Sample

9. We select a sample in order to do what?

   infer information about the entire population

10. For a sample to be a simple random sample of size n, what must be true?

every person in the population must have an equal chance of being selected

11. Voluntary response polls almost always suffer from

bias

Suppose you want to take a simple random sample of size 6 from the 20 participants in your Zumba exercise class. You label the students 01 to 20 in alphabetical order by last name. In the table of random digits, you read the entries

45149 32992 75730 66280 03819 56202 02938 70915

used already

12. The six participants in your selected sample have labels

14, 6, 3, 2, 9, 15

13. Which of these statements about a table of random digits is true?

A) No two-digit number appears more than once in a given row. false

B) It is not possible for 00000 (five zeros in a row) to appear in the table. false

C) It is possible for five consecutive digits (e.g., 12345) to appear in the table. true

D) All of these are true.

E) None of these is true.

STAT 1350, 1/15 Discussion Questions

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 82 people who responded, 79% said "No."

1. The number 79% is a proportion or a mean: which is it?

   proportion

   The number 79% is a statistic or a parameter: which is it?

   Statistic

2. If we applied the quick method to the poll, what is the margin of error? $\frac{1}{\sqrt{82}} = .11$ or 11%

   What is the formula for the 95% confidence interval?

   $\left(p - \frac{1}{\sqrt{n}}, p + \frac{1}{\sqrt{n}}\right)$

   What is the 95% confidence interval we obtain from this formula?

   $(.79 - .11, .79 + .11) = (.68, .90)$ or $(68\%, 90\%)$

   What does this confidence interval mean in the context of the problem? Describe this to someone who does not understand statistics.

   We are 95% confident that the true proportion of students who think the college is not doing enough to provide student parking is between 68% and 90%.

3. Increasing the size of an SRS has these beneficial effects: reduces the margin of error / variability

4. Which of the following is correct?
   - (A) Parameters describe population characteristics. true
   - B) Parameters describe sample characteristics. false
   - C) The population is a subset of the sample. false
   - D) Statistics must be based on a simple random sample. false (should, not must)

5. The margin of error for a poll is 4%. This means that

   the true population parameter is probably within 4% of the value we found in the sample.

6. A statistician tells the producer that the margin of error for a 95% confidence statement for these data is about plus or minus 3 percentage points. The producer therefore reports that between 1.5% and 7.5% (that's 4.5% ± 3%) of all eggs are contaminated. It turns out this isn't right—only 0.1% are contaminated. What went wrong?

not necessarily anything. This could just be one of those 5% of the time when our data was not in the interval.

7. An opinion poll asks a sample of 1100 people whether they support reducing the number of legal immigrants to the United States; 53% of these 1100 people say "Yes." The number 53% is a (proportion or mean; parameter or statistic)?

proportion; statistic

8. If the sample size is much smaller than the population size, the margin of error of a simple random sample depends on

the size of the sample only

9. A 95% confidence interval was created for the proportion of the city's residents that are opposed to constructing a new baseball stadium in the downtown area. By "95% confidence" we mean what? Describe what this means in two different but equally valid ways.

we mean that if we repeat the sample 100 times, about 95% of the time we will get results in that confidence interval.

or we are 95% sure that this sample reflects the true proportion of the population but having the true parameter inside the confidence interval.