Problem Set

Dr. Snycerski used an anonymous survey to investigate the alcohol use of all California residents. The entire group of California residents is an example of a(n):

sample
statistic
population
parameter

A researcher is interested in the sleeping habits of American college students. A group of 125 students is interviewed and the researcher finds that these students sleep an average of 6.2 hours per day. For this study, the 125 students are an example of a _____.

sample
statistic
population
parameter

A researcher is interested in the sleeping habits of American college students. A group of 125 students is interviewed and the researcher finds that these students sleep an average of 6.2 hours per day. This average is an example of a _____.

sample
statistic
population
parameter

A number that describes a population is called a:

parameter
statistic
variable
constant

When using a sample to make inferences about a population, we wouldn't expect the average of the sample to be exactly equal to the average of the population. The difference between the sample and population averages is known as:

sampling error
statistical decision error
population differences
sampling distributions

Sam wants to know the number of hours that US college students work per week, so he asks his friends at San Jose State University to complete a survey. What is wrong with his approach?

Nothing. It makes sense and will provide good data.
His friends may not study a lot.
"Number of hours" is not a viable variable to study.
His sample may not be representative of the population of US college students.
His friends may not want to take his survey.

Which of the following are constructs? Choose all that apply.

How hungry someone is after waking up
How thirsty an athlete is after a game
Your annual income in USD
Your personality
Your height in inches
The fuel efficiency of your car in miles per gallon
The price of an iPad in Swiss francs
Your marketability as an employee

What is an operational definition? Choose all that apply.

- ☐ An abstract concept that we are interested in studying
- ☐ A way of turning constructs into variables we can measure
- ☐ The difference between a sample statistic and population parameter
- ☐ A way of describing a variable in terms of the way we measure it
- ☐ A group of individuals of interest in a research study
- ☐ Estimates of population parameters

In most research studies (choose all that apply):

- ☐ Every individual in the population is included in the study
- ☐ Data from all individuals in the population are used to learn about a sample
- ☐ Data from individuals in a sample are used to learn about a population
- ☐ We expect our best guesses (estimates) of the population parameters to be exactly equal to the actual values
- ☐ We expect our best guesses (estimates) of the population parameters to differ from the actual values
- ☐ We expect our sample statistics will not be exactly equal to the population parameters they are estimating

Which of the following are variables? Choose all that apply.

- ☐ Whether someone is alive or dead
- ☐ Scores on an intelligence test
- ☐ The circumference of the Earth's moon
- ☐ The number of seconds in a minute
- ☐ The number of hydrogen atoms in a molecule of pure water
- ☐ The number of friends people have on Facebook

Extraneous (or lurking) variables (choose all that apply):

- ☐ Provide possible alternative explanations for observed relationships between variables
- ☐ Are factors that could influence the relationships we measure between two or more variables
- ☐ Are usually not that important in drawing conclusions about causal relationships
- ☐ Should be controlled in an experiment before we can make confident causal statements
- ☐ Make it difficult to make causal statements from data from observational studies

$\bar{x}$ is the statistical symbol for the __, whereas μ is the statistical symbol for the__:

- ☐ sample average; population average
- ☐ population average; sample average
- ☐ sample size; population size
- ☐ sampling error; sample size
- ☐ sample size; sampling error

A random sample is one in which you select:

- ☐ individuals based on how easy it is to get data from them.
- ☐ individuals based on who is willing to answer your questions.
- ☐ individuals in such a way that everyone has the same chance of being selected.
- ☐ individuals in such a way that the selection of one individual has no effect on anyone else's chances of being selected
- ☐ your friends, family, and neighbors to participate in your study.

In general, why are random samples better for drawing conclusions about a population than convenience samples? Choose all that apply.

- ☐ They are not better; both types of samples are equally good.
- ☐ They are not better; convenience samples are better than random samples.
- ☐ They are not better; sometimes random samples are better and sometimes convenience samples are better.
- ☐ Random samples are less likely to be biased.
- ☐ Random samples are more likely to be representative of the population from which they are drawn.
- ☐ Random samples are usually easier to obtain than are convenience samples.

Using a random sample (n = 100), researchers found that the average US resident spends 32 hours/week online. Imagine the true value for the entire population of US residents is 25 hours/week spent online. Given this scenario, which of the following is true? Choose all that apply.

- ☐ The sample statistic is 32 and the population parameter is 25.
- ☐ The difference between 32 and 25 is called "sampling error".
- ☐ The sample value is wrong because the sample was random.
- ☐ We should not be surprised that the sample average is different from the population average.
- ☐ The sample statistic is 25 and the population parameter is 32.
- ☐ The amount of sampling error in this example is 7 hours/week (32 – 25).
- ☐ $\bar{x} = 32$; $\mu = 25$
- ☐ $\mu = 32$; $\bar{x} = 25$
- ☐ The sample had 100 US residents in it.
- ☐ We might have found a sample average closer to the population average if we used a larger sample (for example, n = 1000).
- ☐ We should be surprised that our sample average is different than our population average because random samples guarantee 100% accurate estimates.

A researcher found a relationship between the number of hours spent playing violent video games per week and the level of aggression shown by adolescent males, as measured by the Aggression Scale, which is a self-reported measure of someone's aggressive behavior (Orpinas & Frankowski, 2001). More hours spent playing was associated with higher scores on the Aggression Scale. Which of the following are true? Select all that apply.

- ☐ Aggression is a construct.
- ☐ Playing video games causes aggression in adolescent males.
- ☐ Naturally aggressive male adolescents are more likely to play violent video games.
- ☐ Male adolescents who play violent video games will commit violent acts.
- ☐ Males are more violent than females.
- ☐ The operational definition of aggression was the score on the Aggression Scale.
- ☐ If we know how many hours a week an adolescent male plays violent video games, we can predict his self-reported level of aggression.

In an experiment, the researcher manipulates the __ variable, measures changes in the __ variable, and seeks to control __ variables.

- ☐ lurking; dependent; independent
- ☐ continuous; discrete; dependent
- ☐ dependent; independent; lurking
- ☐ independent; dependent; lurking

Imagine that a university sent a student satisfaction survey to a random sample of its 30,000 students. Only 50 of the 1000 sampled students completed and returned the survey. What would you conclude from this information? Select all that apply.

- ☐ The university should make major changes to the curriculum based on these data.
- ☐ There is likely to be non-response bias because most students in the sample did not complete and return the survey.
- ☐ The students who responded may not have reported accurately about their satisfaction.
- ☐ The sample is representative of all 30,000 students because the sample was randomly selected.
- ☐ The sample may not be representative of all 30,000 students for various reasons.

Suppose we randomly assigned people with insomnia to one of two treatment conditions. In one condition, participants received 20 mg of zolpidem (Ambien). In the other condition, participants received a placebo pill. Participants were not told what type of pill they took. After taking the pill, the participants slept in a sleep laboratory to help control for lurking variables. The next morning, in an interview with a psychologist, they rated their quality of sleep on a scale of 1 to 10 (1 being "very poor" and 10 being "excellent"). The psychologist did not know what pill the participants took. The participants in the zolpidem group reported a higher quality of sleep (average = 8) than did those in the placebo group (average = 5).

Which of the following is true about this scenario? Select all that apply.

- ☐ This is an example of an observational study, so we cannot make causal conclusions about the effectiveness of zolpidem.
- ☐ The participants were not blinded to the pill they took.
- ☐ Type of pill (zolpidem or placebo) was the dependent variable.
- ☐ This study is an experimental study, so we can make causal conclusions about the effectiveness of zolpidem.
- ☐ The study used a double-blind control because neither the participants nor the psychologist knew which pill each person took.

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Which of the following is true about this scenario? Select all that apply.

- ☐ The difference in self-reported sleep quality between the zolpidem group and the placebo group was likely not caused by the zolpidem.
- ☐ Sleep quality was operationally defined using a 100-point scale.
- ☐ Type of pill (zolpidem or placebo) was the independent variable.
- ☐ The operational definition of the success of the treatment was the 10-point sleep quality scale.
- ☐ The psychologist was blinded to which pill the participants took.
- ☐ Based on this study, zolpidem appears to be more effective than the placebo pill in improving the quality of sleep, all else held equal.