Week 1 Quiz

6/7 points (85%)

Quiz, 7 questions

✔ **Congratulations! You passed!**

Next Item

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1.

Consider the table below describing a data set of individuals who have registered to volunteer at a public school. Which of the following is a discrete numerical variable?

Name	Year born	Phone number	Number of siblings	Annual income
Jenny	1975	8929223	0	60,000
Ted	1984	8675309	3	22,500
...	...	...	...	...

- name
- phone number
- annual income
- number of siblings

Correct

This question refers to the following learning objective(s):

Identify variables as numerical and categorical.

- If variable is numerical, further classify as continuous or discrete based on whether or not the variable can take on an infinite number of values or only non-negative whole numbers, respectively.
- If variable is categorical, determine if it is ordinal based on whether or not the levels have a natural ordering.

Counted data are discrete numerical variables since they can't take on non-whole values.

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2.

The General Social Survey conducted annually in the United States asks how many friends people have and how they would rate their happiness level (very happy, pretty happy, not too happy). In order to evaluate the relationship between these two variables a researcher calculates the average number of friends for people who categorize themselves as very happy, pretty happy, and not too happy. Which of the following correctly identifies the variables used in the study as explanatory and response?

- explanatory:happiness level (categorical with 3 levels)

  response: number of friends

Correct

This question refers to the following learning objective(s):

Identify the explanatory variable in a pair of variables as the variable suspected of affecting the other, however note that labeling variables as explanatory and response does not guarantee that the relationship between the two is actually causal, even if there is an association identified between the two variables.

Having more friends might cause people to be happier or being happier might cause people to have more friends. So we can't easily determine which variable is the explanatory and which the response based on which we might expect to affect which. However in this particular analysis the happiness level is the explanatory variable since we first divide the data into groups based on this variable, and then analyze summary statistics of number of friends of people who fall into these three categories. Therefore, number of friends is the response variable. Happiness level is a categorical variable that can take on three possible values (very happy, pretty happy, not too happy). These possible values are called levels.

- explanatory:number of friends

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3.

In a study published in 2011 in The Proceedings of the National Academy of Sciences, researchers randomly assigned 120 elderly men and women who volunteered to be a part of this study (average age mid-60s) to one of two exercise groups. One group walked around a track three times a week; the other did a variety of less aerobic exercises, including yoga and resistance training with bands. After a year, brain scans showed that among the walkers, the hippocampus (part of the brain responsible for forming memories) had increased in volume by about 2% on average; in the others, it had declined by about 1.4%. Which of the following is **false**?

- The explanatory variable is the type of exercise, and the response variable is the change in volume of the hippocampus.
- A causal link between walking and expansion of the hippocampus can be inferred based on these results.
- The results of this study can be generalized to all elderly.

Correct

This question refers to the following learning objective(s):

Classify a study as observational or experimental, and determine whether the study's results can be generalized to the population and whether they suggest correlation or causation.

- If random sampling has been employed in data collection, the results should be generalizable to the target population.
- If random assignment has been employed in study design, the results suggest causality.

Results cannot be generalized to the population of all elderly since random sampling was not employed; the

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4.

A school district is considering whether it will no longer allow students to park at school after two recent accidents where students were severely injured. As a first step, they survey parents of high school students by mail, asking them whether or not the parents would object to this policy change. Of 5,799 surveys that go out, 1,209 are returned. Of these 1,209 surveys that were completed, 926 agreed with the policy change and 283 disagreed. Which of the following statements is the **most** plausible?

- It is possible that 80% of the parents of high school students disagree with the policy change.

Correct

This question refers to the following learning objective(s):

Question confounding variables and sources of bias in a given study.

It is possible that all who did not return surveys actually disagree with the policy change.

- The school district has strong support from parents to move forward with the policy approval.
- The survey is unlikely to have any bias because all parents were mailed a survey.

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5.

For your political science class, you'd like to take a survey from a sample of all the Catholic Church members in your town. Your town is divided into 17 neighborhoods, each with similar socio-economic status distribution and ethnic diversity, and each contains a Catholic Church. Rather than trying to obtain a list of all members of all these churches, you decide to pick 3 churches at random. For these churches, you'll ask to get a list of all current members and contact 100 members at random. What kind of design have you used?

- simple random sampling
- stratified sampling
- systematic sampling
- multistage sampling

Correct

This question refers to the following learning objective(s):

Distinguish between simple random, stratified, and cluster sampling, and recognize the benefits and drawbacks of choosing one sampling scheme over another.

First we pick 3 out of 17 clusters at random, and then we sample from within these clusters.

- quota sampling

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0 / 1 points

6.

In an experiment, what purpose does blocking serve?

- [ ] Prevent skewed results.

This should not be selected

Review the learning objective: Identify the four principles of experimental design and recognize their purposes: control any possible confounders, randomize into treatment and control groups, replicate by using a sufficiently large sample or repeating the experiment, and block any variables that might influence the response.

- [ ] Increase sample size.
- [ ] Control for variables that might influence the response.
- [ ] Obtain a random sample.

1 / 1 points

7.

Which of the following is one of the four principles of experimental design?

- [x] randomize

Correct

- [ ] stratify
- [ ] cluster

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