

Name: _____

Date: _____

Quiz 8 – A

1.
 - A. What makes research an observational study as opposed to other types of research?
 - B. Define administrative data. Given an example.
 - C. Why is administrative data considered an observational study?
2. Correlational thinking isn't cause-and-effect thinking. Explain why. Then discuss what types of research questions correlations can actually answer.
3. An observational study finds that variable A (a person not eating breakfast) is correlated to variable B (the person being overweight).
 - A. Give a story of A causing B.
 - B. Give a story of B causing A.
 - C. Give a story of variable C (you invent this) being a common cause of A and B.
- 4.

- A. Give an example of two variables that are completely independent. Explain.
 - B. Give an example of two variables that are partially dependent. Explain.
 - C. Give an example of two variables that are totally dependent. Explain.
5. The universe is a big place, and almost every set of astronomical conditions exists someplace.
- A. What is a natural experiment? Why is this one?
 - B. How does this help astronomers figure out causes and effects of black holes?

Quiz 8 – A – answer key

1.
 - A. In surveys, researchers ask for self-reported information; observational studies are based on observer-coded information. In experiments, researchers control the conditions closely; observational studies are based on observations in a natural setting.
 - B. Administrative data is information recorded for government, legal, or business purposes; it exists for another purpose, even though it also happens to be useful for researcher. Death certificates are a good example.
 - C. The official recording the data is observing something; it's not self-reported data.
2. Correlations are about looking for associations between two or more variables. But because these patterns are observed in real-life situations, not carefully controlled experiments, we don't know whether any observed patterns are about one variable causing the other—or just that the variables happen to happen together. Correlations are not appropriate for answering why questions, only what and how much types of questions. Correlations might let us answer a research question like, “Is there a pattern between a student's gender and reading scores such that we can predict their reading score a bit better with just the information of their gender?”
3.
 - A. Not eating breakfast messes up a person's metabolism, causing them to gain weight.
 - B. Overweight people try to cut out calories, and breakfast is the easiest meal to skip (“No doughnut for me, just coffee today. I'm on a diet”).
 - C. People with sleeping difficulties tend to miss breakfast, due to oversleeping, but sleeping difficulties (and late in the day fatigue) often cause stressed out overeating at night, more than offsetting the calories saved by skipping breakfast.
4.
 - A. Rolling a die and flipping a coin
 - B. S.A.T. reading and math scores
 - C. Age and birthdate
5.
 - A. A natural experiment is one where two situations are exactly the same except for one variable. In the universe, we can always find a situation that is exactly like the one we're already looking at, except for one difference.

- B. Astronomers can find two analogous situations to see how the presence of the black hole changes things.