

Norland Correlation v Causation

Answer these questions using full sentences and correct spelling and grammar. Be as brief and direct as possible. Remember to be clear, correct, and complete.

Read the following conversation and answer the questions that follow:

Feel free to get extra help by searching .edu sites on the Internet for added information.

Three friends, all little league coaches, were talking about hitting. The following is a transcript of their conversation.

(Note: For this exercise, you may cut and paste your answers from the conversation below.)

SARAH: Look, it's obvious; it's just natural talent. Some kids have it and some kids don't. I don't have to do any research or testing. I just know.

PATRICIA: I think the visualization exercises I do with my team work. I have them close their eyes and I walk them through, step-by-step, as they imagine getting a hit.

DELA: Well let's check. I have all the stats from the last three seasons on my laptop right here.

SARAH: Okay, how do we want to define good "hitting," batting average, number of home runs?

PATRICIA: Let's do batting average.

DELA: Okay. Patricia, for the last three seasons, have you done the visualization exercises with all your players?

PATRICIA: Yes. I do the exercise for exactly five minutes in the middle of every practice.

DELA: Well, over the last three seasons, your team's batting average has been ten percent higher than the rest of the league. Your system must work.

SARAH: Whoa! Wait a minute. What if the thing that causes your kids to hit better is the fact that you practice more often, or that you're better at picking players, or that you give them more confidence in another way? I'm not convinced.

DELA: Okay, so there's some relationship between Patricia's visualization exercises and increased batting averages, but the visualization exercises might not be the cause.

PATRICIA: I have an idea. Next year, let's take the list of every kid in the league and randomly pick 60 for the visualization exercise, and 60 to track without giving them the visualization exercise. Then we'll compare the batting averages of the two groups.

DELA: Okay, I'll go for that, but is this really fair? I mean what about the kids on your team that won't get the visualization exercise from you this year? Is it fair to them?

PATRICIA: I agree—that's a tough call, but I'll be doing the exercises with more kids than I ever have before.

SARAH: I don't think we're doing anything wrong to the kids and I'd like to see the results.

DELA: How can we be sure we aren't measuring in a biased way?

SARAH: The umpires will be calling the players safe or out, and the umpires won't know about our experiment. And we shouldn't tell the kids what we're doing either.

PATRICIA: This is going to be great.

One year later...

DELA: The 60 kids in the visualization group had batting averages seven percent higher than the 60 we selected to track but not give the visualization exercise.

PATRICIA: I'm pretty convinced that the visualization exercise works, but I supposed we'd have to do it a bunch more times in other towns to be sure.

SARAH: You're right, but at this point, I'm ready to say it looks like I was wrong. I think your karma ran over my dogma.

PATRICIA: No sweat. This was a good thing to do. I wish other people were as willing as you are to actually think carefully and test out their hypothesis. Another pitcher? Or would you like a double or a triple? Maybe a slider?

1. Quote or paraphrase the part of the conversation that illustrates dogmatic rather than empirical thinking.
2. Quote or paraphrase the part of the conversation that illustrates the theory.
3. Quote or paraphrase the part of the conversation that illustrates the operational definition.
4. Explain whether or not the operational definition was externally valid and why.
5. What was the hypothesis?
6. Quote or paraphrase the part of the conversation that illustrates the correlation.
7. Quote or paraphrase the part of the conversation that illustrates the possible third variables.
8. What was the population?
9. What was the sample?

10. Quote or paraphrase the part of the conversation that illustrates the experimental group.
11. Quote or paraphrase the part of the conversation that illustrates the control group.
12. What was the independent variable?
13. What was the dependent variable?
14. Quote or paraphrase the part of the conversation that illustrates the double-blind nature of the experiment. In other words, how did they do their best to make sure that demand characteristics didn't ruin their experiment?
15. Was the experiment internally valid? List the three criteria and make your best guess from the info you have as to whether or not the experiment fulfilled the criteria.
16. Quote or paraphrase the part of the conversation that illustrates the ethical considerations.
17. Did they follow the five most important ethical rules for psychological research listed in the text? If not, what did they do wrong?
18. Let's say that you were able to access all the patient data from a major urban hospital. You found that 18% of all patients smoke cigarettes, but that 57% of schizophrenics smoke cigarettes. *Because the people being studied decided themselves whether or not to smoke (rather than the researchers randomly assigning smoking), the relationship between the two variables (schizophrenia and smoking) is called a(n) _____.*
19. Let's say you wanted to do further research on the relationship between schizophrenia and smoking. Explain, in two or three short sentences, how you would do an experiment attempting to prove that smoking CAUSES schizophrenia. (Hint: You couldn't really do this experiment financially or ethically, so it will seem ridiculous.)

EXTRA HELP

I decided to share answers to questions 1 - 17 based on a different scenario in the hopes that it would give some of you a better idea about how to answer the questions. Your answers should be very much like my answers below except that your answers should be based on the little league dialogue rather than the exercise/IQ scenario in my example:

A group of friends were arguing about whether or not exercise causes people to be smarter.

1. Quote or paraphrase the part of the conversation that illustrates dogmatic rather than empirical thinking.

"I don't need to test it. It's obvious. My friends who exercise get better grades."

2. Quote or paraphrase the part of the conversation that illustrates the theory.

"Exercise causes people to be smarter."

3. Quote or paraphrase the part of the conversation that illustrates the operational definition.

"Let's define 'smarter' as having a higher IQ."

4. Explain whether or not the operational definition was externally valid and why.

"Yes, most people would agree that an IQ test score is a fair measure of intelligence."

5. What was the hypothesis?

"Those Evansville sophomores who walk for 30 minutes a day for one year will score significantly higher on the IQ test than those who do not."

6. Quote or paraphrase the part of the conversation that illustrates the correlation.

"When we surveyed all the students, those who exercised regularly had higher IQ scores." (Hint: The people surveyed were not chosen randomly, making this a correlation. So this doesn't yet prove that exercise causes higher IQ. There might be third variables other than exercise—like the ones

listed below in the next answer—that are causing those who exercise to have higher IQ scores.)

7. Quote or paraphrase the part of the conversation that illustrates the possible third variables.

“It could be that those who exercise have more free time and less stress, and it's less stress that causes higher IQ. Or it could be nutrition—maybe those who exercise are more concerned about their health and therefore eat better. It could be many things.” (Hint: The key to eliminating these third variables is choosing who is in the experiment randomly. That way, in our experiment, we will have the just as many people with bad nutrition as the general population and just as many with high stress etc.)

8. What was the population?

“The population was sophomores at Evansville High School.”

9. What was the sample?

“The sample was 80 randomly chosen sophomores.”

10. Quote or paraphrase the part of the conversation that illustrates the experimental group.

“The experimental group was 40 randomly chosen sophomores who would walk 30 minutes a day for a year.”

11. Quote or paraphrase the part of the conversation that illustrates the control group.

“The control group was 40 randomly chosen sophomores who would receive no instructions about exercising.”

12. What was the the independent variable?

“The independent variable was exercise—walking for 30 minutes a day.”

13. What was the dependent variable?

“The dependent variable was IQ score.”

14. Quote or paraphrase the part of the conversation that illustrates the double-blind nature of the experiment. In other words, how did they do their best to make sure that demand characteristics didn't ruin their experiment?

“All the sophomores get the IQ test at the end of the year anyway. Except for making sure our randomly selected experimental group actually does the 30

minutes of walking, we won't tell anyone anything about what we're what we're doing."

15. Was the experiment internally valid? List the three criteria and make your best guess from the info you have as to whether or not the experiment fulfilled the criteria.

"They successfully got the 40 students in the experimental group to walk 30 minutes a day. The IQ test was unbiased. (The people giving the test didn't know about the study and couldn't, consciously or unconsciously, make the test easier for those who had exercised.) And in the end those who had exercised scored, on average, 10 points higher than the control group (the correlation). The experiment was internally valid."

16. Quote or paraphrase the part of the conversation that illustrates the ethical considerations.

"Is it fair to the students who don't get picked to exercise?"

17. Did they follow the five most important ethical rules for psychological research listed in the text? If not, what did they do wrong?

"Informed consent: No, they neglected to tell those who exercised that this was part of a psychological experiment.

Freedom from coercion: Yes, no one was forced to exercise.

Protection from harm: Yes, it's highly unlikely that walking 30 minutes a day will cause harm

Risk-benefit analysis: Yes, very little risk here, and they did consider the risk of NOT asking some to exercise.

Debriefing: No, they forgot to tell everyone who participated about the details of the experiment after the experiment concluded."