*YOUR TA’S NAME*:

*Lecture Worksheet*

*Tuesday 11/17/2020*

**MAIN POINTS OF LECTURE**

1. When we talk about *cause and effect* in the social sciences, we usually talk about how one variable (X, the explanatory or independent variable) **affects** another variable (Y, the response or dependent variable)
2. At the heart of all case and effect statements is a counterfactual—the situation that would have existed had the explanatory variable not changed. A fundamental problem in explanatory research is that we never actually observe the counterfactual
3. Three conditions must be met in order to establish that X causes Y:
4. X and Y must be empirically associated (criteria of association)
5. X must precede Y in time (criteria of temporal ordering)
6. There must be no third variable, Z, which acts as a “confounder”—or which induces “spuriousness”—in the association between X and Y (criteria of nonspuriousness)
7. In **experimental research** cases are randomly assigned to two or more comparison groups … X is defined by the group to which cases are assigned
8. The response variable Y is measured before (pre-test) and after (post-test) the manipulation of X; this establishes temporal ordering
9. If the change in Y between the pre-test and the post-test differs across levels of X, then X and Y are associated
10. Because the value of X is assigned at random, spuriousness is not possible
11. **Observational research** involves studying naturally-occurring variation in X and Y, with no intervention from the researcher
12. There are a number of techniques for measuring the association between X and Y
13. Longitudinal designs help to establish temporal ordering
14. However, in observational research it is usually extremely difficult to rule out the possibility that the observed relationship is spurious
15. **Statistical control** is a technique used in observational research to reduce the risk of spuriousness
16. The confounding variables Z are “held constant” so that we can observe the independent association between X and Y “net of” Z
17. Conceptually, holding Z “constant” means observing the association between X and Y among people with equal values on the confounding Z variables
18. We presume that the association between X and Y that persists after statistically controlling for Z is causal in nature (as long as the other criteria have been met)

**QUESTIONS**

1. [From the recorded lecture] What are the counterfactual claims that are implied by these causal statements?

Air pollution affects kids’ school performance

The kids would have done better had they not lived near pollution

Breast implants affect women’s suicide rates

Women would have been less likely to commit suicide had they not had breast implants

Eating a vegetarian diet makes you smarter

People wouldn’t have been so smart had they not eaten a vegetarian diet

Listening to country music leads to suicide

People wouldn’t have committed suicide had they not listen to so much country music

Guns in homes lead to more suicides

Suicide rates would be lower if people didn’t have guns in their homes

1. [From the recorded lecture] Why might the association between A and B be spurious (or at least partly spurious) in the following examples? That is, why might the association between A and B not be entirely causal in nature?

Having a TV set in the bedroom **(A)** is correlated with couples having lower frequency of sexual activity **(B)**

Marital satisfaction may be a confounder. Couples’ unhappiness may cause both A and B, such that the observed association between A and B is spurious (such that A has little or no causal effect on B even though they are associated). There may be other confounders, too.

Listening to sexually explicit music lyrics **(A)** is correlated with teen sexual activity **(B)**

Interest in sex may be a confounder. Teens’ interest in sex may cause both A and B, such that the observed association between A and B is spurious (such that A has little or no causal effect on B even though they are associated). There may be other confounders, too.

Alcohol consumption **(A)** is correlated with violent behavior **(B)**

Gender may be a confounder. Being male may cause both A and B—men tend to drink more and tend to be more violent—and such that the observed association between A and B is spurious (and such that A has little or no causal effect on B even though they are associated). There may be other confounders, too.

1. [From the synchronous session] In the synchronous class, we examined the association between students’ height at age 15 and their like/dislike for video games today. What did we find—both before and after statistically controlling for gender? What does that tell us about the association between height at age 15 and feelings about video games? Is the effect causal?

See the recorded synchronous session to find out!