

Philosophy 12: Introduction to Causal Reasoning

Study questions for Lecture 9: “Causation vs. Association”

1. Assume that Bert and Russell had the Hand Hygiene Act passed (as in the story in the lecture notes), and that everyone obeyed it and washed their hands every day. In the “natural system” smoking causes finger stains. Does smoking cause finger stains in the “experimental system” where everyone washes their hands with Phil Morris’s special soap? Why?
2. Harry’s policy intervention (concerning the story discussed in the readings) is never to hurry. In the “experimental system” representing the causal story after Harry puts his policy into effect, is Leaving Late still a cause of Hurrying? Why?
3. The lights in my neighbor’s office go on when he flips the light switch to the “up” position. Does telling me that the lights are on in my neighbor’s office give me information about the state of the switch?
 - (a) Yes
 - (b) No
 - (c) Not enough information to tell
4. Does the light being on in my neighbor’s office cause the light switch to be in the “up” position?
 - (a) Yes
 - (b) No
 - (c) Not enough information to tell

What Harry observed in weeks of research was a positive association between hurrying and arriving late. Among the people he observed, those who hurried had a higher chance of arriving late than those who didn’t. For simplicity, let’s assume that overall, half of the people Harry observed were late, and half on time. Among the half that were late, the proportion of those who hurried was higher than among the half that were one time.

5. If we put a chip for each person Harry observed into a new barrel, stirred it up and picked one out at random, what are the chances of the person arriving late in Harry’s study?
 - (a) 25%
 - (b) 50%
 - (c) 75%
6. Now suppose that we pick another chip, and tell you that the person had hurried. Using figure 4200–1 from the lecture notes, what are the chances that the person was late?
 - (a) 50%
 - (b) Lower than 50%
 - (c) Higher than 50%
 - (d) Not enough information to tell

Imagine we had a large barrel that contained one chip for every American. Furthermore, suppose I tell you that 28% of Americans smoke.

7. Suppose we pick a chip randomly out of the barrel. What are the chances that the chip represents a person who smokes?
 - (a) 28%
 - (b) Lower than 28%
 - (c) Higher than 28%
 - (d) Not enough information to tell

8. Suppose that we replace the first chip, stir the barrel, and pick another chip from the barrel at random. Now suppose we tell you that the person picked has nicotine-stained fingers. What are the chances that they smoke?
- (a) 28%
 - (b) Lower than 28%
 - (c) Higher than 28%
 - (d) Not enough information to tell
9. Suppose that we replace the chip, stir, and pick another chip from the barrel at random. Suppose that we then tell you that the person picked has a cousin who owns a red shirt. What are the chances that the person picked smokes?
- (a) 28%
 - (b) Lower than 28%
 - (c) Higher than 28%
 - (d) Not enough information to tell

For problems 10 through 13, assume the following population facts:

- 28% smoke
- 10% have nicotine stained fingers
- Smoking and nicotine stains are positively associated
- Smoking causes nicotine stains

Suppose, then, that we choose a person at random from the population.

10. If you know nothing about whether the person selected at random has nicotine stained fingers, what is the chance that he or she smokes?
- (a) 28%
 - (b) More than 28%
 - (c) Less than 28%
11. Suppose we learn this person does not have nicotine stained fingers. Use that information to specify the chance that this person smokes.
- (a) 28%
 - (b) More than 28%
 - (c) Less than 28%
12. Now, suppose we intervene in some way to force the person we have selected to have nicotine stained fingers (say, by applying nicotine paint to their fingers). Assuming that all effects produced by having nicotine stained fingers appear immediately, what is the chance that this person smokes?
- (a) 28%
 - (b) More than 28%
 - (c) Less than 28%
13. Now, suppose we force the person we have chosen to remove all stains from his or her fingers. Assuming that all effects produced by having stain-free fingers appear immediately, what is the chance that this person smokes?
- (a) 28%
 - (b) More than 28%
 - (c) Less than 28%

For problems 14 through 21, assume the following population facts:

- 50% study hard
- 35% score high on the final exam
- Studying and scoring high are positively associated
- Studying hard is a cause of scoring high

Suppose we choose a person at random from the population.

14. If you know nothing about whether the person selected studies hard, what is the chance that he or she scores high on the final exam?
 - (a) 35%
 - (b) More than 35%
 - (c) Less than 35%
15. Now suppose we learn that the person selected studies hard. Use that that information to specify the likelihood that this person scored high on the final exam.
 - (a) 35%
 - (b) More than 35%
 - (c) Less than 35%
16. Now suppose that we force the person we have chosen to study hard. Assuming that all effects produced by studying appear immediately, what is the chance that this person scores high on the final?
 - (a) 35%
 - (b) More than 35%
 - (c) Less than 35%
17. Now suppose we force the person you have chosen to not study. Assuming that all effects produced by not studying appear immediately, what is the chance that this person scores high on the final?
 - (a) 35%
 - (b) More than 35%
 - (c) Less than 35%
18. If you know nothing about whether this person scores high, what is the chance that this person studied hard for the final exam?
 - (a) 50%
 - (b) More than 50%
 - (c) Less than 50%
19. Suppose we learn that this person did not score high on the final. Use that information to specify the chance that this person studied hard for the final exam.
 - (a) 50%
 - (b) More than 50%
 - (c) Less than 50%

20. Now suppose we guarantee the person we have chosen a high grade on the final (perhaps by fraudulently changing his or her score on the final after it was graded). Assuming that all effects produced by receiving a high grade appear immediately, what is the chance that this person studied hard for the final?
- (a) 50%
 - (b) More than 50%
 - (c) Less than 50%
21. Now suppose we give the person we have chosen a low grade on the final. Assuming that all effects produced by receiving a bad grade appear immediately, what is the chance that this person studied hard for the final?
- (a) 50%
 - (b) More than 50%
 - (c) Less than 50%
22. If two properties P_1 and P_2 are associated, then learning that someone has property P_1 changes the chances that they have property P_2 .
- (a) True
 - (b) False
 - (c) True only if P_1 is a cause of P_2
 - (d) True only if P_2 is a cause of P_1
23. If two properties P_1 and P_2 are associated, then intervening to make someone have property P_2 changes the chances that they have property P_1
- (a) True
 - (b) False
 - (c) True only if P_1 is a cause of P_2
 - (d) True only if P_2 is a cause of P_1

“President Clinton seems to think that the answers to the Littleton massacre can be found at the movies Yesterday in an Oval Office ceremony, Mr. Clinton announced that he had persuaded the National Association of Theater Owners to demand that youths produce photo identification before seeing R-rated movies. And last week the President launched a \$1 million federal inquiry into entertainment industry marketing techniques...”

“Numerous correlative studies (the President cited the figure as 300, but the actual number is closer to 1,000), indicate an association between media violence and aggression.”

(From “Violence Doesn’t Begin in the Theater”, Wall Street Journal, June 9, 1999)

Clearly President Clinton proposed an intervention that would reduce the number of teenagers who see violent movies. The reason President Clinton proposed this intervention is that he believes that reducing the number of teenagers seeing violent movies will reduce the number of teenagers who commit violent acts (like the Littleton massacre).

24. “President Clinton believes that reducing the number of teenagers seeing violent movies will reduce the number of teenagers who commit violent acts.” This is:
- (a) A causal claim
 - (b) An association claim
 - (c) Both a causal claim and an associational claim
 - (d) Neither a causal claim nor an association claim

25. The article quote above says that there is evidence of an association between media violence and aggressive behavior. That evidence might be something like: “the average number of violent movies seen by American teenagers per year is 15 while the average number of violent movies seen by teenagers who commit violent acts is 30.”
- Would this evidence prove that reducing the number of teenagers seeing violent movies will reduce the number of teenagers who commit violent acts?
- (a) Yes
 - (b) No
26. Which of the following states of affairs, if true, would justify the proposed policy of stricter enforcement of exclusion of teenagers from violent movies?
- (a) Violent acts by teenagers are associated with viewing violent movies.
 - (b) Violent acts by teenagers are caused by violent violent movies.
 - (c) Violent acts by teenagers and violent movies are both caused by the pressured pace of modern life.
 - (d) Violence in movies is caused by violent acts by teenagers.
27. Was Clinton’s proposed policy justified by the evidence of association between media violence and teenage aggression?
- (a) Yes
 - (b) No