

Cause/correlation

On page 127 of *How to Write Better Essays* I use the heart disease example to illustrate the mistake that occurs when we confuse a cause with a correlation. It illustrates that, prior to identifying something as a cause and not a mere correlation, we must have something analogous between the two things, something that allows us to conclude that one might be the cause of the other.

Example

Crime

In our attempt to explain the rise in violence in Western societies we might find that 60% of all those convicted of violent offences regularly watch violent programmes on TV. Such a correlation is very persuasive, but, as in the heart disease example, is it any more than this? Is it just a correlation or is it also the cause? We might find that 60% of those convicted also chew gum, but we're less likely to believe that this is the cause.

We know of no causal link between crime and chewing gum, so we probably wouldn't have looked for any correlation between the two, but we do have an idea how there might exist a causal link between violent programmes and violent behaviour. We can conjure up from our imagination an analogy of a person seeing violent crime on the TV and then going out and imitating the same behaviour on the streets.

Example

Car crash

If I were to drop my pen and, just a fraction of a second later, we were both to look out of the window to see a car crash in the street below, it would not be convincing for me to argue that the first event caused the second, because we know of no law or uniformity in our experience in which the dropping of pens cause cars to crash. However, if I were to argue that the light reflected off the falling pen, distracting the driver, who then lost control and crashed, it would still not be as convincing as it should be for a satisfactory explanation, but it is on its way.

The reason is that we have had analogous experiences in our own lives when people have been distracted in what they are doing by loud noises or bright lights, and this has led them to make mistakes or have accidents. We have used such patterns to explain events before; they have a good track record, so we feel confident about using them again in this case.

Example

Stress and breast cancer

In the section on the *Post hoc fallacy* in this website I cited a report in the *British Medical Journal* of an 18-year study involving over 6,500 women, which found that those with high levels of stress were 40 per cent less likely to develop breast cancer than those who described their stress as low. But another study, this one over 24 years, published in 2003, found that women who endured high levels of stress ran twice the risk.

Putting aside the obvious problem that both studies seem to be arriving at conflicting conclusions, we still need to know in both studies that the apparent connection between stress, or the lack of it, and breast cancer is in fact a causal connection and not just a correlation, like that between crime and chewing gum.

Exercises

1. Obesity and stomach cancer

Suppose it is found that there is a very much higher incidence of stomach cancer among those who are obese (those who have a BMI¹ over 30), than those who have a normal weight (no more than 25 BMI). In other words, there is a high *correlation* between obesity and stomach cancer. Do we have good grounds for inferring a *causal connection*? If not, why not and how can we settle the issue?

2. Marriage and owning a pet

¹ Body Mass Index – an index that compares weight and height to identify when someone is overweight to an unhealthy degree.

Studies have shown that men aged 18-27 who have owned a pet for at least 2 years before marrying are 35% less likely to divorce. Researchers conclude that caring for a pet prepares men for long-term, healthy relationships in marriage.

Which of the following, if true, most strengthens the conclusion that men who have owned pets are prepared for healthy marriages?

- A. Studies have shown that pet ownership drastically reduces daily stress levels.
- B. Many successful marriages are based on emotional investment in a common interest, such as a pet.
- C. Many men who have been married for 25 years or more continue to own pets.
- D. Men who have not owned pets for at least two years before marrying are more likely to divorce.
- E. Men whose wives who owned a pet for at least two years are equally as unlikely to divorce.

Answer

- A. While this may be true, it does not introduce *additional* evidence to support the conclusion.
- B. This option does not address the question of why *men* who own pets are less likely to divorce.
- C. The question concerns men who have owned pets *before* marrying, not after.
- D. Correct.** This option provides additional evidence of a causal correlation between pet ownership and the likelihood of divorce.
- E. The question concerns *men*, not their wives.