V

Arguments about Causes

We sometimes try to explain why something happens by arguing about its *cause*. Suppose, for instance, that you wonder why some of your friends are more open-minded than others. You talk to your friends and you discover that most of the open-minded ones are also well-read –they keep up with the newspapers, read literature, and so on- while most of the less open-minded ones are not. You discover, in other words, that there is a *correlation* between being well-read and being open-minded. Then, because being well-read seems to be correlated with open-mindedness, you might conclude that being well-read *leads* to open-mindedness.

Arguments from correlation to cause are widely used in the medical and social sciences. To find out whether eating a full breakfast improves your health, doctors do a study to find out whether people who usually eat a full breakfast live longer than people who usually don't. To find out whether reading does tend to make a person more open-minded, a psychologist might devise a test for open-mindedness and a survey of reading habits, give the tests to a representative sample of the population of the regular readers are also open-minded.

Formal tests like these usually enter our arguments as arguments from authority: we rely on the authority of the people who did the tests, looking to their credentials and to their professional colleagues to make sure they are informed and impartial. We do have an obligation, however to read and report their studies carefully, and to try to assess them as best as we can.

Our own arguments about causes usually have less carefully selected examples. We may argue from some striking cases in our own experience, or from our knowledge of our friends or of history. These arguments are often speculative –but then, so are their more formal cousins that come from doctors and psychologists. Sometimes it is very difficult to know what causes what. This chapter offers several questions to ask of any argument about causes, and then a set of reminders about the pitfalls of moving from correlation to cause.

(18) Does the argument explain how cause leads to effect?

When we think that **A** causes **B**, we usually believe not only that **A** and **B** are correlated but also that it "makes sense" for **A** to cause **B**. Good arguments, then do not just appeal to the correlation of **A** and **B**: they also explain *why* it "makes sense" for **A** to cause **B**.

NO:

Most of open-minded friends are well-read; most of my less open-minded friends are not. Reading, then, seems to lead to open-mindedness.

YES:

Most of open-minded friends are well-read; most of my less open-minded friends are not. It seems likely that the more you read, the more you encounter challenging new ideas, ideas that make you less confident of your own. Reading also lifts you out of your

> daily world and show you how different and many-sided life can be. Reading, then, seems to lead to open-mindedness.

This argument could be more specific, but it does fill in some important connections between cause and effect.

More formal and statistical arguments about causes –in medicine, for example- also must try to fill in connections between the causes and effects they postulate. Doctors don't stop with evidence that merely demonstrates that eating a full breakfast is correlated with improved health; they also want to know *why* eating a full breakfast improves health.

> Doctors N. B. Belloc and L. Breslow, respectively of the Human Population Laboratory of the California Department of Public Health and of the Department of Preventive and Social Medicine at UCLA, followed 7000 adults for five and half years, relating life expectancy and health to certain basic health habits. They found that eating a full breakfast is correlated with greater life expectancy.[12] It seems probable that people who eat a full breakfast get more of the necessary nutrients than people who skip breakfast or go through the morning on snacks and coffee. It is also likely that if the body starts out the day with a good meal, it metabolizes later meals more efficiently. Thus, it seems likely that eating a full breakfast leads to better health.

Notice that this argument not only explains how cause may lead to effect, but also cites its source and explains why that source is an informed source.

(19) Does the conclusion propose the most likely cause?

Most events have many possible causes. Just finding a possible cause, then, is not enough; you must go on to show that it is the most *likely* cause. It is always possible that the "Bermuda Triangle" really is inhabited by supernatural beings who protect their domain from human intrusion. It's *possible*. But the supernatural explanation is highly unlikely compared to the other likely explanations for the disappearance of ships and planes: tropical storms, unpredictable wind and wave patters, etc. (If indeed there is anything unusual about the Bermuda Triangle at all: remember rule 10.) Only if these everyday explanations fail to account for the facts should we begin to consider alternative hypotheses.

Likewise, it is always possible that people become open-minded, or at least tolerant, because they are just tired of arguing. Maybe they just want to "let the long contention cease," as Matthew Arnold put it. It's *possible*. But we also know that not very many people are like that. Most people who have dogmatic views stick up for them; it pains them too much to see other people going astray. Therefore, it seems more likely that people who become tolerant have truly become open-minded, and reading remains a likely cause.

How do we know which explanations are most likely? One rule of thumb is: prefer explanations which are compatible with our best-established beliefs. Natural science is well-established; so is our ordinary understanding of what people are like. Sometimes the most likely explanation may still be wrong, of course, but we have to start with our best guesses.

Sometimes additional evidence is necessary before *any* explanation can be accepted with much confidence. More evidence is necessary when several competing "natural" explanations all

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[12] See Belloc and Breslow, "The Relation of Physical Health Status and Health Practices," *Preventive Medicine*, volume 1 (August, 1972), pp. 409-421.

fit the available evidence. Rules 20-23, though not exhaustive, explain some of the most common types of competing explanations.

(20) Correlated events are not necessarily related

Some correlations are just coincidental

> Ten minutes after I took Doctor Hartshorne's Insomnia Bitters." I was once asleep.
> Therefore , Doctor Hartshorne's Insomnia Bitters" put me to sleep

Here the event being explained is my going to Sleep. Because my going to sleep was correlated with my taking "Doctor Hartshorne's Insomnia Bitters," the argument concludes that taking the "Bitters" was the *cause* of my going To sleep. However, although "Doctor Hartshorne's Insomnia Bitters" *may* have put me to sleep, I may also have fallen asleep on my own. Maybe it had nothing to do with the "Bitters." Maybe I Was tired, and took the "Bitters" shortly before I would have fallen asleep anyway.

Doctor Hartshone could have her day in court. We would need to set up a controlled experiment, with one group of people using the "Bitters" and another group not using it. If more people who did not use it, then it may have some medicinal value after all. But mere correlation, by itself, doe not *establish* a cause-and-effect relationship. The rise and fall of women's hemlines has correlated for years with the rise and fall of the Dow Jones Industrial Average. but who thinks that one causes the other? The world is just full of coincidences.

(21) Correlated events may have a common cause

Some correlations are not relations between cause and effect but represent two effects of some *other* cause. It is quite possible, for instance, that being well-read and being open-minded are both cause by some third factor: by going to college, for example. Being well-read, then, might *not* itself lead to open-mindedness: instead, going to college leads to open-mindedness (maybe by exposing a person to many different points of view), and helps a person become well-read as well. You may need to survey your friends again: find out which ones went to college!

> **Or:**
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> Television is ruining our morals. Shows on television portray violence, callousness, and depravity –and just look around us!

The suggestion here is that "immorality" on television causes "immorality" in real life. It is at least as likely, however, that both televised "immorality" and real-life "immorality" are caused instead by more basic common causes, such as the breakup of traditional value-systems, the absence of constructive pastimes, etc. Or again:

> Over the past 20 years, children have watched more and more television. Over the same period, college admission test scores have steadily declined. Watching television seems to ruin your mind.

The suggestion is that watching television causes lower test scores. It would be useful, for a start, if this argument explained exactly how the alleged cause, watching television, leads to this effect (rule 18). In any case, other explanations seem at least as good. Maybe something quite different accounts for the drop in test scores –a drop in the quality of the schools, for example –which

would suggest that the two correlated trends are not related (rule 20). Then again, possibly, *both* watching television *and* lower test scores might be caused instead by some common cause. Maybe, for instance, the lack of more challenging pastimes is again at fault.

(22) Either of two correlated events may cause the other

My parents tell me that when I was a small child, I thought that the cause of fires was firemen. After all, at every fire I saw, there were firemen. It was a natural association. Only later did I learn that fires "causes" firemen, not the other way around.

Correlation, then, does not establish the direction of causality. If A is correlated with B, A may cause B –but B may also cause A. The very same correlation that suggests that television is ruining our morals, for example, could also suggest that our morals are ruining television. So, in general, yet another kind of alternative explanation also needs to be investigated.

This problem effects even the most advanced studies of correlations. Psychologists might devise a test for open-mindedness and a survey of reading habits, give the tests to a representative sample of the population, and then check to see whether an unusually high proportion of the readers are also open-minded. Suppose that there is indeed a correlation. It still does not follow that reading leads to open-mindedness. Open-mindedness might lead instead to reading! After all, people who are open-minded may be more likely to seek out a variety of papers and books in the first place. This is one reason that it is important to explain the connections between cause and effect. If you can fill in plausible connections from A to B but not from B to A, then it seems likely that A leads to B rather than vice versa. If B could lead to A as plausibly as A leads to B, though, then you can not tell which direction the cause goes –or perhaps it goes both ways.

(23) Causes may be complex

It is occasionally argued that pedestrian walkways across streets are more dangerous than unmarked streets, because crosswalks seem to be correlated with a higher, not lower, number of accidents. Often the suggested conclusion is that walkways themselves cause accidents, perhaps by creating in the users a "false sense of security." Remembering rule 22, though, we should also consider the possibility that the causal connection runs the other way. Maybe, in a manner of speaking, accidents cause crosswalks. Crosswalks don't just appear arbitrarily, after all: they tend to be put at places where accidents have frequently happened. But they may not necessarily solve the problem. Dangerous places may become less dangerous, but not suddenly safe.

Moreover, once a crosswalk is installed, still more people are likely to use it. So we might well expect the *number* of people involved in accidents at these locations to increase, rather than decrease, although the accident *rate* should decrease.

Clearly this story is a complex one. A false sense of security might well play some role, especially if the accident rate has not decreased as sharply as we might expect. At the same time we should not forget that crosswalks are usually put precisely at places where accidents tend to happen. Again, causes need not be either-or: sometimes the answer is "both".

Many causal stories are complex. Maybe, again, reading makes you more open-minded, but it is surely also true, as section 22 pointed out, that open-mindedness is likely to lead some people to

read more. Maybe healthy people are also precisely people who are inclined to eat a full breakfast in the first place. Don't overstate your conclusion. Seldom do we fasten onto the on and only cause. Causal arguments are important because even finding *a* cause is often useful. Just to know that eating a full breakfast is correlated with better health, and *probably* leads to better health, may be enough reason to try to eat fuller breakfasts.