

The *post hoc* fallacy

The unreliable inferences that result from oversimplifying arguments, as a result of using stereotypes, straw men, special pleading and false dilemmas, occur because writers omit certain things from their assumptions to help them reach the conclusion they want to. But the other source of unreliable inferences relates just to the inferences themselves and not as a result of the assumptions a writer makes. Frequently writers draw unreliable inferences as a result of creating invalid causal connections. The mistakes that are made are not difficult to understand, but they are easy to miss.

Perhaps the most common reason for these mistakes is that writers assume that they have established a necessary and sufficient condition to explain why something occurred, when in fact they might have only discovered a necessary condition. They might think they have established a sufficient condition for A to be the cause of B, but they only have a necessary condition, which means that there are likely to be other causes that they have overlooked.

Examples

Economic depression and sunspots

The economist, W. Stanley Jevons, noticed that in timing and duration the cyclic nature of economic depressions and the appearance of sunspots resembled each other with the former following the latter. From here it was a relatively short step

to argue that the sunspot cycle was the cause of economic depressions. However, in this case sunspots are neither a necessary nor a sufficient condition.

Exercise

Stress and breast cancer

Recently it was reported in the *British Medical Journal* that an 18-year study involving over 6,500 women 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. This suggested that stress and breast cancer were causally related: that more stress was likely to result in a lower risk of breast cancer. Can you think of a plausible alternative explanation for these findings that would not assume that they are causally related?

Answer

One possible explanation might be that the women who are better at reporting stress are also better at monitoring their health and responding promptly to lessen the danger of other unstated factors. This is likely to result in better management of their stress and the factors that would increase the risk of breast cancer.

