Session 6 : Common Causal Fallacies

Remember Homer and Lisa!

Homer: Not a bear in sight. The Bear Patrol must be working like a charm!
Lisa: That's specious reasoning, dad.
Homer: Why thank you, honey.
Lisa: By your logic, I could claim that this rock keeps tigers away.
Homer: Hmm. How does it work?
Lisa: It doesn't work; it's just a stupid rock!
Homer: Uh-huh.
Lisa: But I don't see any tigers around, do you?
Homer: Hmm... Lisa, I want to buy your rock.

It is common in critical thinking to find arguments that make links that aren't really there. However to say that one thing follows another thing or that there is a correlation between two things is *not* necessarily a reason to assume that one event causes another.

1. Post Hoc Ergo Propter Hoc
This is the simplest and most common causal fallacy. Literally 'after this, therefore because of this.'

•A follows B.   Therefore B must have caused A!

This is not necessarily true. After I sneezed, America invaded Iraq but that doesn't mean I caused the war in Iraq!

2. Cum Hoc Ergo Propter Hoc
This is more sophisticated than "after this because of this"
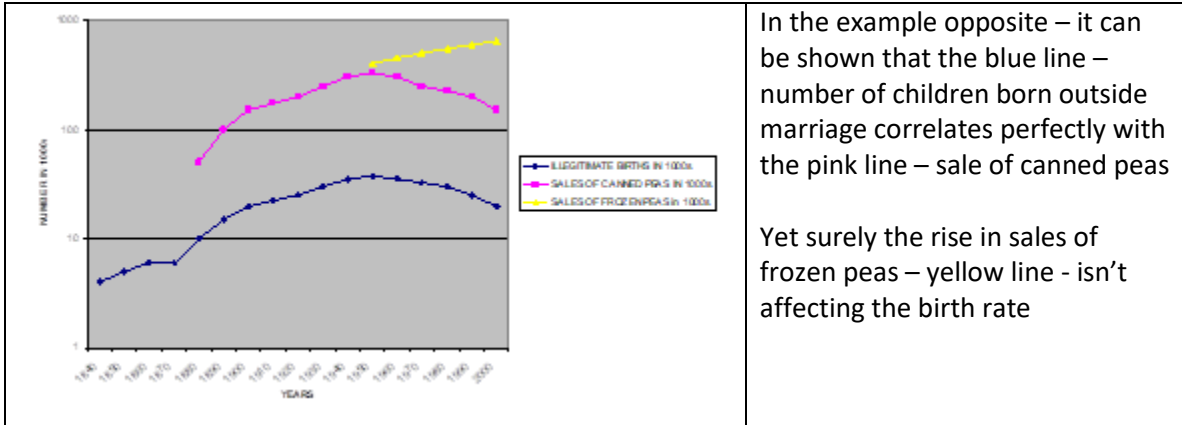It is not just one thing before the other
      But a well-established regularity:

 A and B regularly **correlate over a long period of time.**
      AB, AB, AB, AB, AB, AB, AB, AB, AB……………………

However see the example below of **the canned peas**! The two events may not be linked and there may be another explanation

In the example opposite – it can be shown that the blue line – number of children born outside marriage correlates perfectly with the pink line – sale of canned peas

Yet surely the rise in sales of frozen peas – yellow line - isn't affecting the birth rate

Dealing with Cum Hoc
When someone claims to have found a cause and effect relationship, we need to consider whether there may be other explanations. There are 3 possible altermatives

(1) A and B **are joint effects** of some **underlying cause**!

| A + B | A + B | A + B | A + B |

| C | C | C | C |

For Example: There is a positive correlation between increase in shoe size in children and an increase in their vocabulary. But big shoes do not cause improvements in English! Rather both are effects of growing older!

(2)The order of **causation may go in the opposite direction**!

AB   AB   AB   AB   AB   AB   AB together

Not because A causes B. . . But because B causes A! This is always possible with correlations which occur together in time

Example: Gun Crime
Suppose there is a well established correlation across many societies and times between
          -High ownership of guns
          -High levels of violent crime
It is tempting to conclude guns cause violent crime. However, it is equally possible on this data to conclude high levels of violence cause people to buy guns!

(3) Or it might just be **a coincidence**!

Just because a historian or social scientist discovers a correlation this does not prove there has to be any causal link!

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Remember the pirates - there has been a drop in the number of pirates over the last 300 years while the same period has witnessed a steady increase in carbon emissions. Is the drop in pirates to blame? Should the Paris climate agreement have encouraged government aid for pirates?

Think of the canned peas again – the actual explanations are the wider availability of contraception and more homes getting freezers