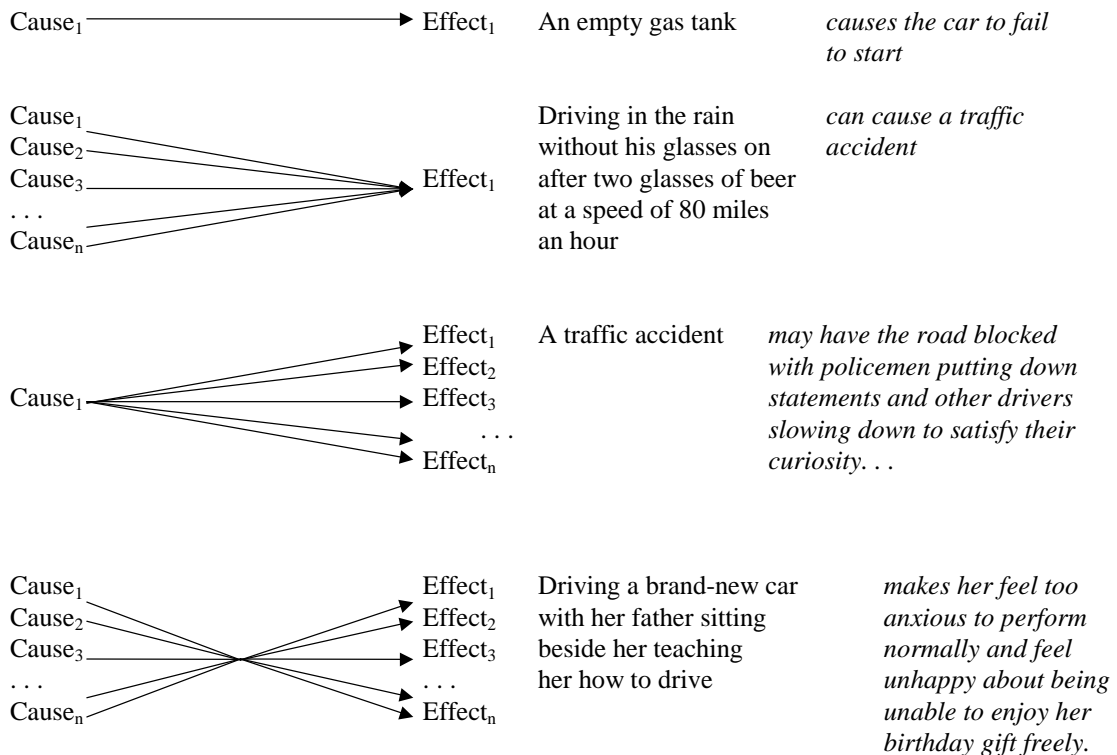


Causal Analysis

1. What is the relationship between cause and effect?

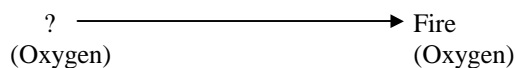


2. What do you need to know when you discuss cause and effect?

3. What are *necessary*, *contributory*, and *sufficient* causes, respectively?

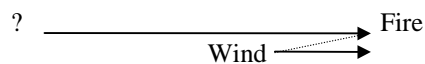
A *necessary* cause must be present for the effect to occur but by itself cannot produce the effect.

My examples:



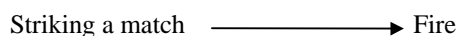
A *contributory* cause leads to an effect but cannot produce it by itself.

My examples:



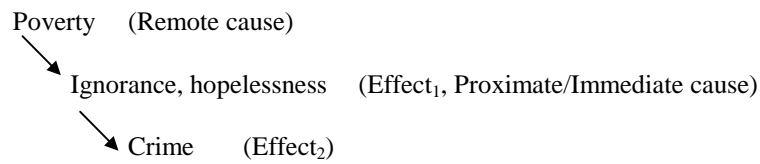
A *sufficient* cause by itself can produce an effect.

My examples:



4. From “Why they excel” by Fox Butterfield, can you identify the different types of causal relationship?

5. What is a *remote* cause? What is a *proximate/immediate* cause?



6. What is a *post hoc* fallacy?

The post hoc fallacy means “after this, therefore because of this.”

Consider the following statements:

John took Vitamin C every day and he does not have cancer now. Therefore, vitamin C is definitely an effective element to prevent cancer.

Find one or two examples (in English or in Chinese) in the newspaper that illustrates this fallacy.

7. Is it important to have the time sequence accurate and inclusive?

8. What is the difference between “*correlation*” and “*cause and effect*”?

The *correlation* does not show any causal relationship between X and Y variables. It only shows simultaneous increase or decrease in value of X and Y variables (numerically valued random variables) with which we can either predict X by looking at Y.

We can say that *there is the positive correlation between cigarette smoking and the incidence of lung cancer*, but we cannot say that *cigarette smoking causes the incidence of lung cancer*.

Example:

Student ID	Degree of anxiety	scores
A	6	30
B	2	87
C	5	40
D	1	95
E	2	85
F	6	32
G	4	50
H	3	45

What is the relationship between *anxiety* and *the achievement of exams*?

Consider the following statement:

- (1) The students did not do well on their test because they have too much anxiety.
- (2) Too much anxiety caused them to perform poorly on their test.

9. Is the following essay a good causal analysis?

The Volkswagen and the Accident

The time was 11:30, on a cold, dark night. Our Volkswagen rounded the unexpectedly sharp turn in the mountain road. Suddenly, some rocks on the road became visible under the car lights—it was too late to miss them. The Volkswagen leaped to the left and spun around twice, the tires screeching. Then it skidded over the dirt embankment, tumbling end over end, then side over side, and finally coming to rest on its top seventy-five yards down the mountain side, its body “totaled.”

Why did this accident occur? What were the major factors in its cause? The rocks and the speed of the car were factors, of course; but I suggest that certain features in the design of the Volkswagen itself contributed.

One of these features was the light weight of the Volkswagen, and another, closely related to it, was the imbalance of the weight, the back being heavy in comparison to the front. The Volkswagen simply did not hold the road as a heavier car would have. The impact caused a swerve that a heavier car would not have made, and the imbalance increased the centrifugal force. The Volkswagen skidded 114 feet, spinning, before we went over the embankment.

The third feature is the narrow wheel base of the Volkswagen. Just as a closed fist resting fingers down on a table is harder to knock over than a fist resting on its side, so an automobile with a wide base in comparison to its height is harder to knock over than a Volkswagen, as high as it is wide, its base small, its wheels close together. In our accident, the impact of hitting the rocks caused the car to leap, whereas if the base of the car had been resting on a larger area, it would have resisted the impact.

Sometimes, economy is expensive.