In this presentation, we will discuss the concept of causality and will discuss how to examine a case from a legal perspective while looking for causal claims or relationships. The first area that we need to understand is the difference between causation and correlation. A correlation is a simple relationship between two items, events, or variables that occur together. This can be based on a statistical analysis or on observation, but there is no implication that one caused the other.

In order to establish causality, you have to prove that one event produced another event as an effect. This is typically very difficult to prove and there are a number of different tests that need to be met to establish a causal relationship. The main one is that one must occur prior to the other – in other words, the cause must precede the effect. Second, the events have to be related, or co-vary. Finally, other plausible alternative explanations must be ruled out, making causality very difficult to prove. For example, when a pharmaceutical company wishes to establish a cause and effect relationship for a new drug (i.e., the effect is the treatment of a specific symptom or condition), it often takes years and dozens of studies to eliminate all other plausible explanations for the effect (i.e., the successful treatment of the condition). Asking the question “Why?” often leads us to the cause and effect relationship.

When we are examining causal claims, we need to keep in mind the conditions necessary to establish a causal relationship. Many times, an author will interpret a set of events and indicate that a causal relationship exists. In this case, we need to be able to rule out any other rival causes – in other words, we have to rule out any other potential interpretation or cause of the observed event. If we cannot rule out the potential rival causes, we will never know with certainty whether the author is correct in claiming the item is the true cause or if the rival event (or even some other event) is the true cause of the observed effect.

There are three different types of rival causes: those related to differences between groups, those that have correlations between characteristics; and the post hoc ergo propter hoc fallacy.

First, any time an author claims that a cause stems from a specific difference between two or more groups, we have to ask ourselves, “Are there other differences in the groups that may be relevant?” If we think there may be another factor, we have a potential rival cause, thus reducing the strength of the author’s claim.

Second, there is simply a correlation between two items frequently, but the author claims there is a causal relationship between the items. Here, we should ask if the link works in reverse. In other words, let’s say the author claims that a company with a higher marketing budget causes higher performance, and a lower budget causes lower performance. While there may be a distinct correlation between these two items, let’s ask ourselves the reverse question. In other words, “Can strong performance cause a higher marketing budget, and low performance cause a lower marketing budget?” In this case, we can answer yes to the question, since a lower performance can imply less funding available for marketing, hence a lower marketing budget, and, similarly, higher performance can imply higher funding available for a marketing budget. We cannot definitely say that one event occurred before the other one, and we have provided a viable alternative explanation using reverse causality. We can also think of other factors that can cause a reduced marketing budget other than lower company performance – for example, it is not effective at producing the desired results may be one. So here, we have a case of reverse causality or a potential third factor that can explain the relationship between the
company's performance and its marketing budget. As a result, we cannot make any claims of causality.

Finally comes the Latin phrase, “*Post hoc, ergo propter hoc,*” which basically means that after this, therefore because of this. Here after we see an event occur, another event occurs. We falsely assume that the second event occurred because of the first one…we imply that the first event caused the second one simply because it occurred before the second event. Just because one event precedes one in time does not mean that it caused the second event.

Let’s look at this scenario. Here, people’s health problems have increased near some wind farms. It was discovered that some activists distributed fliers that warn citizens of the potential health risks associated with being located near these farms. In communities where no warning fliers were distributed, the frequency of health problems did not change. Is there a cause and effect relationship between wind farms and people’s health? This is a good example of a *post hoc, ergo propter hoc* fallacy. After a wind farm was built, there were observed increases in health problems. Hence there was an assumed causal relationship that the wind farms caused the health problems. We could also come up with other alternative explanations, and we see that in some areas near farms, there was not an increase in health problems.

Take a moment to read this quote. Here, a Swedish study found that golfers lived about five years longer than the rest of the population. What is the implied causal relationship? Can you think of any alternative causes? This claim was made based on observed differences between two groups of people, namely golfers and non-golfers. What are some other differences between the groups that were not accounted for here?

In this scenario, a recent UK study found that 25% of workers were formally reprimanded for clutter. Messy workspaces were found to increase employees' stress levels. What is the cause and what is the effect here? Can you think of any plausible alternative causes? Can it work in reverse? Here we see a good example of valid explanations working both ways or a situation of reverse causation.