

Today's post comes from Antony Ritz, a Veritas Prep GMAT instructor in [Washington, D.C.](#)!

Correlation vs. causation is a sticky and oft-overlooked topic that can lead to misunderstandings and wrong answers on the GMAT. However, once you can learn to contrast these two concepts, you will not only understand both, but be less likely to confuse them on the test.

What is Correlation?

To say that two items are correlated is to say that they vary together. A correlation between two items means that if one item is present then the other item is more likely to be present than it otherwise would be. The presence of one item does not have to guarantee the presence of the other or even make the presence of the other item likely in any absolute sense.

Statements like the following indicate correlation:

- “Babies born prematurely were more likely to have low birth weights and to suffer from health problems than were babies not born prematurely.” (*Premature birth is correlated with low birth weight and health problems.*)
- “People who drive cars equipped with antilock brakes have more accidents than those who drive cars not equipped with antilock brakes.” (*Antilock brakes are correlated with accidents.*)

But correlation is not causation.

What is Causation?

Causation is not so easily defined. In the purest sense, causation means that the “effect” event would not have happened if the “cause” event had not occurred. It is all but impossible to draw definitive conclusions about what would have happened if things had been different, so we will avoid focusing on any exact definition of causation.

Statements such as the following indicate causation:

- “Adequate prenatal care significantly decreases the risk of low birth weight babies.”
- “Experiencing an earthquake can cause people to dream about earthquakes.”

Importantly, we must recognize what causation is not. First, causation is not correlation. We must be able to identify statements of correlation and distinguish them from statements of causation. Second, causation is not the same as formal logical arrow diagrams and if/then statements – causation is not implication. For example, to say that “smoking ‘causes’ cancer” does NOT mean that “if you smoke, then you will get cancer.” Causation as it is used on the GMAT can exist even if the cause in question does not always produce the effect. Third, causation is not dependent on the effect in question always being a product of the given cause. That is, something can be a cause of a given effect even if it is not the only cause capable of producing that effect. All of these points are regularly represented in wrong answers on the GMAT.

Once you understand the difference between correlation and causation, we can move onto our next post on the topic – picking the right explanation for a correlation, which is sometimes, but not always, direct