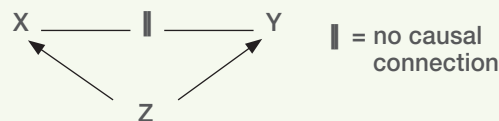


Cause-and-effect relationships occur when there is a relationship between variables so that one variable stimulates a change in another. Once we have determined that there is probably a relationship, or correlation (the fact that the two variables, such as poverty and dropping out of school, both occur in the same situation), we need to take the next step: analyzing which comes first and seeing if one variable causes change in another. The **independent variable** is the variable in a cause-and-effect relationship that comes first in a time sequence and causes a change in another variable—the **dependent variable**. If we hypothesize that poverty causes Hector and others to drop out of school, *poverty* is the independent variable in this hypothesis, and *dropping out of school* is the dependent variable, dependent on the level of poverty. In determining cause and effect, the independent variable must always precede the dependent variable in time sequence if we want to try to determine whether the independent variable causes a change in the dependent variable.

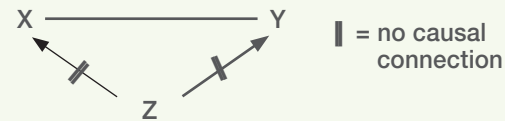
SPURIOUS RELATIONSHIPS



Spurious relationships occur when there is no causal relationship between the independent and dependent variables, but they vary together, often due to a third variable affecting both of them. For example, if the quantity of ice cream consumed is highest during those weeks of the year when most drownings occur, these two events are correlated. However, eating ice

cream did not *cause* the increase in deaths. Indeed, hot weather may have caused more people both to purchase ice cream and to go swimming, with the larger number of swimmers resulting in more drowning incidents. The connection between ice cream and drownings is a *spurious relationship*.

CONTROLS



Controls are steps used by researchers to eliminate all variables except those related to the hypothesis—especially those variables that might be spurious. Using controls helps ensure that the relationship is not spurious. Using the ice cream example, we might have studied beaches where lots of ice cream was sold and beaches where none was available in order to compare water death incidents. If there was no difference in death rates, the drownings could not have been caused by the ice cream.

Engaging With Sociology

1. Think of a possible cause-and-effect relationship that you would like to study.
2. Determine your independent and dependent variables.
3. What variables would you have to control for in order to determine that the relationship between your independent and dependent variables is not spurious or just a correlation?