MDM4U

Section 3.4

Cause And Effect

Usually the main reason for a correlational study is to find evidence of a **cause and effect relationship**:

There are various types and degrees of **causal** relationships between variables. They are as follows:

Cause and Effect Relationship- A change in X produces a change in Y. For example an increase in the speed of a production line produces an increase in output of items produced.

Common Cause Factor- An external variable causes two variables to change the same way. For example, a hot summer causes more people to go to the beach *and* increases the sales of water.

Reverse Cause and Effect Relationship – The dependent and independent variables are reversed in the process of determining the relation. For example, a research project attempts to shows people drinking coffee get nervous but finds nervous people drink more coffee.

Accidental Relationship – A correlation exists by accident. An increase in number of students enrolled in Data Management and increase in the number of BMW's on the road.

Presumed Relationship-A correlation seems apparent although it can not be proven. For example, Active people will like a new sports channel on tv.

Now let's practice.

Example 1

Match each of the following types of causal relationships with the most appropriate example from the list below.

a. cause-and-effect relationship   d. accidental relationship
b. common-cause factor   e. presumed relationship
c. reverse cause-and-effect relationship

_____   1.   The population of certain species of animals decreases as logging in wilderness areas increases.

_____   2.   The sales of sports cars increase as the school year comes to a close in June.

_____   3.   The price of bread and canola oil both increase sharply after the prairies experience a drought during the growing season.

_____   4.   Studies find that consumption of vitamin C reduces the number and severity of colds that people get.
_____   5.   Demand for consumer goods increases as the unemployment rate decreases.

Example 2

List the type of correlation and casual relationship that you would expect to find for each of the following pairs of variables.

a) the price of gasoline at the pump, the current world price of crude oil

b) the fish population in a lake, the number of cottages around the lake

c) the humidex rating (an index based on air temperature and humidity), the number of respiratory ailments reported

d) the stock price of a telephone company, the cost of car insurance

e) parents' educational level, their children's success in school