

Section 3.1.11 – Response & Explanatory Variables

VCAA “Dot Points”

Investigating associations between two variables, including:

- response and explanatory variables and their role in investigating associations between variables
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Response & Explanatory Variables

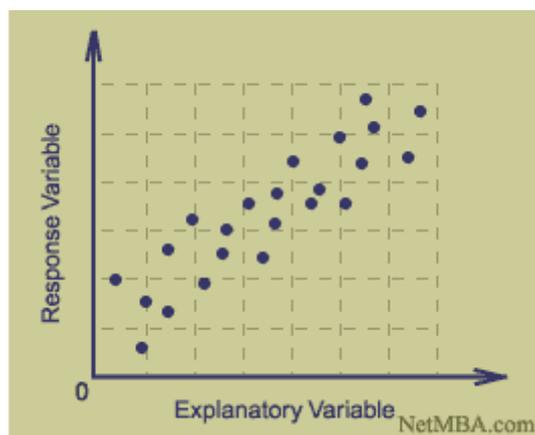
A set of data involving **two variables** where one affects the other is called **bivariate data**.

A **response variable**, also known as dependent variable, is something that responds to or depends on other factors. Often the response variable is the outcome of a study or research.

For example, a test score could be a response variable because it could respond to several factors such as how much you studied or how much sleep you have had.

An **explanatory variable**, also known as an independent variable, is a variable that **explains changes** in the response variable.

For example, someone's age might be an explanatory variable used to explain a person's salary.



NB: When graphed the explanatory variable is graphed on the **x axis**.
When graphed the response variable is graphed on the **y axis**.

An easy way to remember is to insert the names of the two variables you are using in the below sentence in the way that **makes the most sense**. Then you can figure out which is the explanatory variable and which is the response variable:

(explanatory variable) can explain a change in the (response variable) and it isn't possible that the (response variable) can explain a change in the (explanatory variable).

Example 1

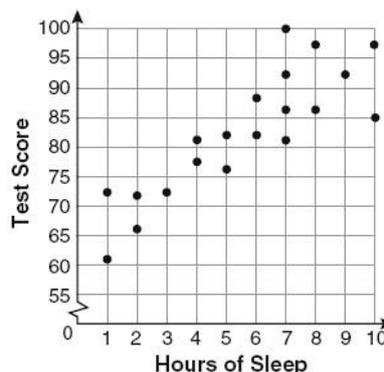
Consider the example of two variables shown in the graph to the right:

- Test Score
- Hours of sleep

Which variable is the response variable and which is the explanatory variable?

From the graph it can be seen that:

- Test score is y-axis, \therefore response variable
- Hours of sleep is x-axis, \therefore explanatory variable



Alternatively check the following sentences:

(Hours of sleep) can explain a change in (Test Scores)

(Test Scores) can explain a change in (Hours of sleep)

We see that "Hours of sleep" must be the explanatory variable and "Test Score" must be the response variable because the sentence doesn't make sense the other way around.

Example 2

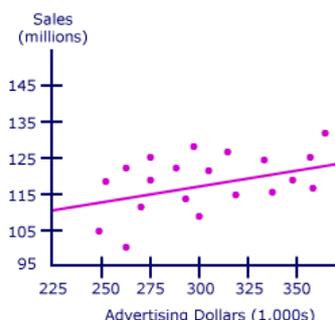
Consider the example of two variables shown in the graph to the right:

- Sales
- Advertising expenditure

Which variable is the response variable and which is the explanatory variable?

From the graph it can be seen that:

- Sales is y-axis, \therefore response variable
- Advertising expenditure is x-axis, \therefore explanatory variable



Alternatively check the following sentences:

(Advertising expenditure) can explain a change in (Sales)

(Sales) can explain a change in (Advertising expenditure)

We see that "Advertising expenditure" must be the explanatory variable and "Sales" must be the response variable because the sentence doesn't make sense the other way around.