Independent Variable Encyclopedia Article

Independent Variable

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Independent Variable

An independent **variable** is the variable that is acted upon by a function. In the traditional variable set-up of an equation like $y = 3x + 7$ or $y = x^3$, x is the independent variable. That is, y depends upon x. Often, **equations** can be rewritten so that the independent variable appears to be the dependent one and vice versa. However, in statistical and scientific contexts, it usually becomes clear from the context of the application of the equation which is which.

In an experimental setting, the independent variable is the one that a researcher can set himself or herself. For example, if one is examining the magnitude of gravitational attraction between bodies as a function of the mass of one of those bodies, the mass would be the independent variable, the part the researcher can change with impunity. In other words, this is the source of direct change in the experiment. It is also sometimes called the "control" variable, while the **dependent variable** is the "experimental" variable.

In many situations, there will be more than one independent variable for a dependent variable. These are usually designed so that each can be changed independently of each other, with whatever convolutions are necessary. Each function can have many different partial derivatives that are taken with respect to the separate independent variables. In a properly designed experiment, the independent variable parameters will be varied separately from each other so that the effects of each are clear. Real world situations rarely reflect a properly designed experiment.