



Introduction

Before you can do any kind of statistics you need data. This might have been provided for you or you might need to collect it yourself.

Your data will consist of a number of **variables**, with a value for each variable for each participant (experiment) in your study.

This resource looks at different ways of describing your data and the variables it contains. You will often need to consider these descriptions when thinking about how to analyse your data. (Note: Data is plural. You should say 'data are' not 'data is'.)

Primary and Secondary Data

Primary data refers to any data that you collect yourself – it might come from measurements you have made or from a survey. It will be new data that you have generated yourself.

You might collect your data using a survey developed by someone else – for instance there are standard 'instruments' for assessing psychological factors. If you need to put together your own survey, see our Planning a Survey resource.

Secondary data refers to data that has been collected by somebody else. This might be data given to you by your lecturer or you might need to find it by searching the literature. You can contact the librarians for help with a literature search.

Dependent & Independent Variables

If you go on to use statistical tests you might need to distinguish **dependent** and **independent** variables. You might think of independent variables as the input and dependent variables as the output. These are not always fixed properties of the variables themselves but will depend on the analysis you are doing.

If you were interested in how the time taken to complete a task is affected by gender and weight, then you would think of the time as the dependent variable and gender and weight as independent variables.

If you were interested in whether weight is affected by gender, then weight would be the dependent variable and gender the independent variable.

If you were looking at the association between height and weight, then neither would be considered dependent.



Nominal, Ordinal, Scale variables

Each of your variables will be one of these types. It is important to know what kind of variables you have as this will affect how you can analyse your data. If you are developing your own survey think about what kind of variable each question will give you. If you are using SPSS you will need to specify this on the variables tab.

Examples of **Nominal** or **Categorical** variables are Gender, Ethnicity and Group (e.g. smoker/non-smoker, treatment/control). Each participant in your sample can identify with, or be assigned to, exactly one of the groups - there should be no overlap. (In a survey a participant would tick one of the options you have given.) However, there is no obvious order to the groups in the sense that you cannot say that one group is higher (or better) than another.

Examples of **Ordinal** variables are age groups (e.g. under 25, 26 – 40, 41-60, over 60) and Likert scales (Strongly agree, agree, neutral, disagree, strongly disagree). Each participant will be in exactly one group but there is a clear order to the groups. For instance, someone in the 41-60 years age group is older than someone in the under 25 age group and someone choosing 'Strongly agree' is more in agreement than someone choosing neutral. However, we cannot say exactly how much older or how much more in agreement the participant is.

Scale variables involve some kind of measurement. Examples include age in years and the time taken to complete a task. With this kind of variable we can say, for instance, that one participant is 5 years older than another or took 5 minutes longer to complete a task. Sometimes scale variables are divided into *ratio* variables, which have an obvious zero (e.g. weight, height, time) and *interval* variables which have equal markings on a scale but no clear zero (e.g. 0 degrees Fahrenheit is not the same temperature as 0 degrees Celsius).

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