

Variable Types

A **nominal** variable takes on values that are names or labels. These are sometimes also called **categorical**. Nominal variables with two levels (possible values they can take on), like gender (with levels “male” and “female”) are called **binary variables** or **Bernoulli trials**. There are different statistical techniques for binary variables (whether they are predictor or response variables) than for nominal variables with several levels.

Note that in some cases, nominal variables have values (levels) that are numbers. For instance, entrees at a restaurant may be numbered on the menu, and one could collect data on which entrée various customers ordered by listing the number in the dataset. However, the number in this case is just a label, and does not indicate any sort of quantity. This is sometimes called a **coded (nominal) variable**.

A **quantitative** variable is numerical, and represents a measurable quantity. These are sometimes called **scale** or **numerical**. Quantitative variables may be broken down into **discrete** and **continuous** variables, and this can have an affect on the way they are analysed. They may also be broken down into **interval scale** or **ratio scale**, although this does not affect the type of analysis carried out.

An **ordinal variable** is a variable whose values can be put into a meaningful order, but where the differences between levels are not meaningful. Sometimes ordinal variables are considered as a subcategory of categorical variables, and they are often treated as categorical when they are predictor variables.

Examples of **nominal** variables:

1. Gender (male, female).
2. Breed of a dog (Alsatian, Labrador, Terrier, Spaniel, Poodle, Dalmatian, Husky etc...).
3. Universities students attend (Loughborough, Birmingham, Oxford, Nottingham, Warwick, Swansea etc...).
4. Eye colour (blue, green, brown, hazel etc...)
5. Blood type (A, B, AB, and O).

Examples of **quantitative** variables:

1. Length of a road (cm, m, km, miles etc...).
2. Population of a city.
3. Time (milliseconds, seconds, minutes, hours, days, years etc...).
4. Height (cm, inches, m, ft. etc...).
5. Weight (pounds, kilograms, grams, ounces, stones etc...).
6. Heart rate.

Examples of **ordinal** variables:

1. Stages of cancer: I, II, III, IV.
2. Likert scale variables: with levels such as strongly disagree, disagree, neutral, agree, strongly agree (or similar scales).
3. Educational level: primary, secondary, university, postgraduate.