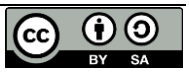
Data Types

The data you collect from your samples can be one of several data types. These data types can have a large influence on your analysis. Some data type limit the type of analyzes that are suitable. Here we will cover some of the major data types, how they are usually analyzed and assumptions often associated with the data type.

- Ratio Scale Data - These are data that have a constant interval size and a true zero point. These include:
    - weights (mg, lb, etc.),
    - volumes (cc, cu ft, bd ft, etc.),
    - capacities (ml, qt, gal. etc.),
    - rates (cm/sec, mph, mg/min, etc.) and
    - lengths of time (hr, yr., etc.).
        - Proportional Data - A special case of Ratio Scale Data is Proportional data. This is data that is divided by the largest value in the data set or by some theoretical maximum value. This type of data is assumed to be binomially distributed. Binomial distributions can be converted to normal distributions by an arc sine transformation (arcsin(x)).
- Interval Scale Data - These are data that have a constant interval but not a true zero point. Examples include:
    - temperature scales such as Celsius (C) or Fahrenheit (F),
    - time of day, or
    - compass azimuth.
- Ordinal Scale Data - These data only convey information on the order and relative magnitude of the data. An example is:
    - letter grades (A, B, C, D, and F) where an A is better than a B, but in this system the amount is undetermined.
- Nominal Scale Data - These data are descriptive categories. Examples are:
    - animal eye color, (Blue, brown, green, red, etc.),
    - sex (male, female),
    - organism status (dead, alive).



Author: David R. Larsen
Created: October 6, 2013
Last Updated: August 18, 2014

Ratio, internal and ordinal data can be measured in two ways:

- Continuous Data - These are data that could take on almost any value within the observed range. Obviously we don't have instruments that can measure beyond some minimum resolution but theoretically the data could take on any value.
- Discrete Data - These are data can take on only specific values within the range of observed. Example of this is counts such as the number of eggs, number of individuals, etc.

Also See:

Chapter 1 - Introduction pages 1-6 in:

Zar, J. H. 2007. Biostatistical Analysis. Prentice-Hall, Inc. Englewood Cliffs, New Jersey. 718 pp.

Schuster, E. G. and H. R. Zuuring. 1986. Quantifying the Unquantifiable. J. For. 84(4):25-30.

Author: David R. Larsen
Created: October 6, 2013
Last Updated: August 18, 2014