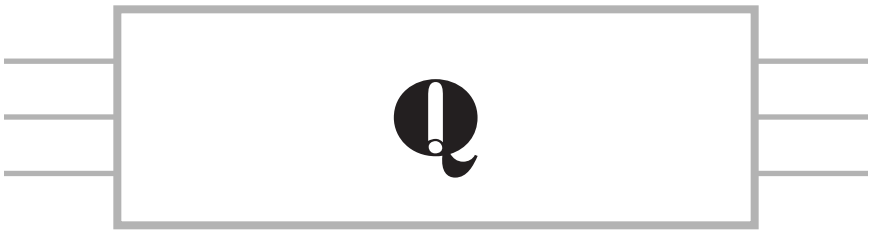


q–q plot– A **scatter diagram** in which **quantiles** of two series of **observations** are plotted. It is used as an informal method for checking the assumption of **normality** of a **statistical model.**

qualitative data– Data obtained on measures of a **qualitative variable,** i.e., using nominal and ordinal **scales of measurement.** See also *categorical data, nominal data, numerical data.*

qualitative observations– Same as *qualitative data.*

qualitative variable– A **variable** that is normally not expressed numerically because it differs in kind rather than degree among **elementary units.** The term is more or less synonymous with **categorical variable.** Some examples are hair color, religion, political affiliation, nationality, and social class. See also *quantitative variable.*

quality assurance– The use of statistical procedures and techniques designed to ensure the **reliability** or **validity** of a process.

quality control– The use of statistical procedures and techniques for the purpose of maintaining the quality of a manufactured product or a laboratory test within acceptable limits. Central to the use of **statistics** in quality control is the concept of **variance.** If one were to summarize the entire field of statistical quality control, also called statistical process control (SPC), in one word, it would have to be variance. The procedure is aimed at identifying the sources and magnitude of **variability** and reducing them to an acceptable level. The simplest such procedure involves the use of a **control chart.** See also *quality assurance.*

quality control chart– Same as *control chart.*

quantal assay– An **experiment** in which groups of subjects usually animals are exposed to a certain amount of stimulus (e.g., concentration of drugs) and the objective is to estimate the **proportion** of individuals responding to the drug at a particular dose level. For example, groups of mice may be injected with different doses of insulin and the proportion of mice showing convulsion at each does level is recorded.

quantal response– Same as *binary response.*

quantal response assay– Same as *quantal assay.*

quantal variable– Same as *binary variable.*

quantile–quantile plot– Same as *q–q plot.*

quantiles– A general term for the $n - 1$ partitions that divide a **frequency** or **probability distribution** into n equal parts. In a probability distribution, the term is also used to indicate the value of the **random variable** that yields a particular **probability.** The term is essentially synonymous with **fractiles.** See also *deciles, octiles, percentiles, quartiles, quintiles.*

quantitative data– Same as *numerical data.*

quantitative distribution– Same as *numerical distribution.*

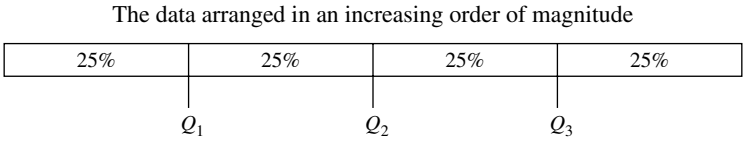
quantitative factor– Same as *quantitative variable.*

quantitative observations– Same as *quantitative data.*

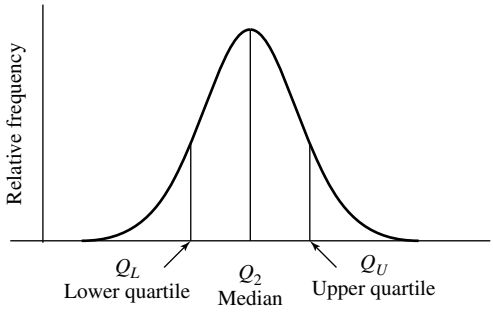
quantitative variable– A **variable** that is normally expressed numerically because it differs in degree rather than kind among **elementary units.** See also *qualitative variable.*

quartile deviation– Same as *semi-interquartile range.*

quartiles– Values in a **data set** that divide the **observations** into four quarters, each of which contains 25% of the observed values. The 25th **percentile,** 50th percentile, and 75th percentile are the same as the first, second, and third quartiles, respectively. The first, second, and third quartiles are denoted by Q_1, Q_2, and Q_3 respectively. The first and third quartiles are often called the lower and the upper quartiles and the second quartile is known as **median.** See also *centiles, deciles, octiles, quintiles.*



Schematic representation of quartiles of a data set



Schematic illustration of quartiles of a distribution

quasi-experiment– A kind of **research design** where the experimenter may be able to manipulate certain **independent variables** but subjects cannot be randomly assigned to **experimental** and **control groups.** Such designs often resemble **experiments** but are weak on some of the characteristics, particularly **randomization.** See also *clinical trial, experimental study, prospective study.*

quasi-factorial design– Same as *lattice design.*

quasi-independence– A term used in the analysis of a **contingency table** to describe the **independence** of rows and columns conditional on only a part of the table.

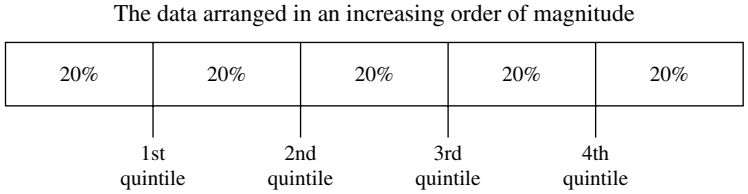
questionnaire– A document containing a list of questions to be administered to a group of people or organizations under the provisions of strict confidentiality.

Quetlet's index– A measure of obesity calculated by dividing the weight of an individual by the square of the height. It is one of the anthropometric measures of body mass and has the highest **correlation** with skinfold thickness or body density.

queuing theory– A mathematical theory of **probability** concerned with the study of the problem of queues, e.g., the **distribution** of arrival time, the length of the queue at a given time, the **average** waiting time and so forth. It is used in many practical settings to study waiting times. The overall objective in queuing theory is to find means of solving problems of congestion and, in particular, of reducing congestion, which is supposed to be taking place in the form of a queue. The problem of queues arises in a number of situations other than people waiting in line. For example, machines awaiting repair in a factory and the orders report on hold as a result of those machines being out of service are regarded as queues. There are three basic statistical elements in most queuing problems: (1) the average number in the system, (2) the average rate of arrival, and (3) the average rate of departure, which is equal to the average rate of service. There are two broad approaches to the problems: The analytic, which involves the use of mathematical methods, and the computer or **Monte Carlo simulation.**

quick and dirty methods– A term used earlier to describe **nonparametric methods** that were easily performed, but were thought to be inferior to the corresponding **parametric methods.** However, it turns out that many nonparametric procedures require much more computation and in some cases are more efficient than their normal theory counterparts. For example, in the case of **data** with a **normal distribution,** where the ***t* test** is optimal, Wilcoxon's procedure loses very little efficiency whereas in other nonnormal situations, it is superior to the *t* test.

quintiles– The quintiles divide a **data set** into five equal parts, each of which contains 20% of the total **observations.** The **percentile points** at the 20th, 40th, 60th, and 80th intervals are the same as the first quintile, second quintile, third quintile, and fourth quintile respectively. See also *deciles, octiles, percentiles, quartiles.*



Schematic representation of quintiles of a data set

quota sample– A **nonprobability sample** that is selected by dividing a population into categories and selecting a certain number of subjects (a quota) from each category. For example, the **sample** may consist of individuals with a certain quota for different age, sex, and racial/ethnic groups. The quota assigned to each group is generally proportionate to its share of the population being surveyed. This type of selection procedure can produce biased results, since interviewers are much more likely to choose respondents who are easily accessible and willing to be interviewed. Since **random sampling** procedures are not employed for drawing a quota sample, the **reliability** or **precision** of **sample estimates** cannot be determined.