

jackknife— A **nonparametric technique** for estimating **standard error** of a **statistic**. The procedure consists of taking repeated subsamples of the original **sample** of n **independent observations** by omitting a single observation at a time. Thus, each subsample consists of $n - 1$ observations formed by deleting a different observation from the sample. The jackknife estimate and its standard error are then calculated from these truncated subsamples. For example, suppose θ is the **parameter** of interest and let $\hat{\theta}_{(1)}, \hat{\theta}_{(2)}, \dots, \hat{\theta}_{(n)}$ be **estimates** of θ based on n subsamples each of size $n - 1$. The jackknife estimate of θ is given by

$$\hat{\theta}_J = \frac{\sum_{i=1}^n \hat{\theta}_{(i)}}{n}$$

The jackknife estimate of the standard error of $\hat{\theta}_J$ is

$$\hat{\sigma}_{\hat{\theta}_J} = \left[\frac{n-1}{n} \sum_{i=1}^n (\hat{\theta}_{(i)} - \hat{\theta}_J)^2 \right]^{1/2}$$

See also *bootstrap*.

jackknife residuals— A method of assessing the **assumptions** or **goodness of fit** of a **model** by examination of its **residuals**. Each residual is calculated from a model that includes all but the **observation** corresponding to the residual in question. Jackknife residuals are also known as Studentized residuals.

Jensen's inequality— Given a **discrete random variable** X having a finite number of points, the inequality states that $g[E(X)] \geq E[g(X)]$, where g is a concave function.

Jewell's estimator— In a 2×2 **contingency table**, an **estimator** of the **odds ratio** obtained by adding 1 to each **cell frequency** that appear in the denominator. It is calculated by the formula $ad/\{(b+1)(c+1)\}$, where a , b , c , and d are the four **cell counts**. See also *Haldane estimator*.

Johnson's system of distributions— A class of **frequency distributions** based on **transformations of variables**. The distributions can be used to summarize a set of **data** by

means of mathematical functions, that will fit the data. It was elaborated by Norman L. Johnson in 1949.

joint confidence intervals– Same as *simultaneous confidence intervals*.

joint contingency table– A **contingency table** involving two or more **independent variables** jointly affecting a **dependent variable**.

joint density function– A generalization of the concept of a **probability density function** to two or more **continuous random variables**. Joint density function is also known as a joint probability density or a **multivariate density function**. See also *bivariate density function*.

joint distribution– Same as *joint probability distribution*.

joint probability– The **probability** of two or more **events** occurring simultaneously. It is a measure of the likelihood of the simultaneous occurrence of two or more events.

joint probability density– Same as *joint density function*.

joint probability distribution– The concept of the **probability distribution** of a **random variable** extended to two or more random variables. It is also known as a multivariate probability distribution. A multivariate probability distribution is characterized by a **multivariate probability function** involving **discrete random variables** and a **multivariate density function** for **continuous random variables**.

joint probability function– A generalization of the concept of a **probability function** to two or more **discrete random variables**. Joint probability function is also known as a **multivariate probability function**. See also *bivariate probability function*.

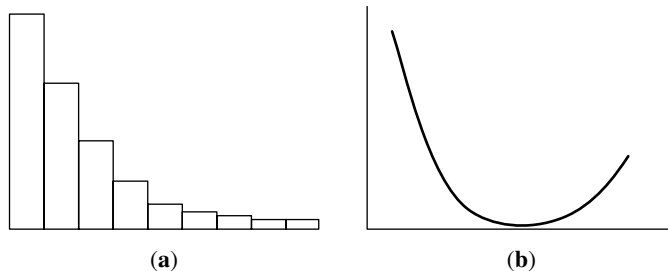
Jonckheere k -sample test– Same as *Jonckheere–Terpstra k -sample test*.

Jonckheere–Terpstra k -sample test– A **nonparametric procedure** for testing the equality of k **location parameters** against an **ordered alternative hypothesis**. For an **ordered alternative**, the test is more powerful than the **Kruskal–Wallis test**, which is an omnibus test of differences between **locations**.

Jonckheere–Terpstra test– A **nonparametric procedure** for testing a specific type of departure from independence in a **contingency table** where both rows and columns represent ordered categories.

Jonckheere test– Same as *Jonckheere–Terpstra k -sample test*.

J-shaped distribution– An asymmetrical **frequency distribution** having general resemblance to the shape of the letter J. The **distribution** has highest **frequency** at one end of the distribution, which rapidly declines at first and then declines more slowly.



Inverse J-shaped distribution: (a) histogram and (b) continuous curve

judgmental errors— Errors caused by differences in the criteria used in classification based on individual judgments.

judgment sample— Unlike a **probability sample**, a **sample** selected in such a manner that an “expert” judgment plays a major role in selecting **elementary units** for **observations**. In general, any sample that is not a probability sample. Although judgment samples may lead to satisfactory results, they lack the **reliability** of a **scientific sample**. See also *convenience sample*, *nonprobability sample*, *random sample*.

judgment sampling— See *judgment sample*.