Central Limit Effect

Central Limit Effect (or Theorem) is one of the main theorems of probability. It states that if a random sample is drawn from a general population, the distribution of the means (or the totals) of that random sample will approximate a normal curve, even if the population from which it is drawn is not normally distributed. The degree to which the distribution of the random sample approaches a normal curve improves dramatically as the sample size increases.

The usefulness of the Central Limit Effect (Theorem) for inference about means is hard to overstate. It allows us to use the normal curve (along with relatively simple and straightforward mathematics) to approximate the sampling distribution of means in a wide variety of practical situations.

$$\mu = Mean\ of\ a\ Population$$
$$\sigma = Standard\ Deviation\ of\ a\ Population$$
$$\overline{y} = Mean\ of\ n\ Process\ Values$$
$$n = Sample\ Size$$

If the mean of a population is μ and the standard deviation of the population is σ, then the distribution of $\overline{y}$ is approximately a normal curve with mean μ and a standard deviation of $\frac{\sigma}{\sqrt{n}}$. Notice how the standard deviation of $\overline{y}$ decreases as n increases, but only at the rate of the square root of n.