Population formula

σ ← standard deviation

variance $= \sigma^2$

Population size $(N) = 460$

Min $= -5$ Max $= 5$ $R = 10$

total size in table $= 452$

$$\text{mean} = \mu = \frac{\sum x_1}{N} = \frac{-186}{452}$$

$$= -0.4115$$

mean $(\mu) = -0.4115$

median $= 0$

mode $= 0$

$$\sigma = \sqrt{\frac{\sum(x_1 - \mu)^2}{N}} = \sqrt{\frac{2377.460155}{452}} = 2.2934$$

Male graph

Normal Distribution

Mean $\bar{x} = -0.64284$ $\quad \bar{x} = \frac{x}{n} = \frac{-88}{137} = -0.6428..$

Median $= 0$

mode $= 0$

Sample size $(n) = 137$

degree of freedom $(d.f) = n-1 = 137-1 = 136$

Sum $= -88$

$\alpha = 95\%$ or 0.05

$S = 2.331804$

$S^2 = 5.437$

$$S = \sqrt{\frac{(x-\bar{x})^2}{n-1}} = \sqrt{\frac{317.1253}{138}} = 2.0378..$$

$$\text{Standard error (SE)} = \frac{S}{\sqrt{n}} = \frac{2.332}{\sqrt{137}} = 0.1992$$

$$\text{t-test} \quad t = \frac{m-\mu}{\frac{S}{\sqrt{n}}} = \frac{-0.64234-(-0.4115)}{0.1992} = -1.1587$$

t-test $= -1.1587$

min $= -5$

max $= 5$

$R = 10$

Female graph $n=144$

normal distribution

$\text{Sum} = -97$

mean: $\bar{x} = -0.6806$ $\bar{x} = \frac{x}{n} = \frac{-97}{144} = -0.68\%$

mode $= 0$

median $= 0$

$\alpha = 0.05$ or 95%

min $= -5$

max $= 5$

$R = 10$

$$S = \sqrt{\frac{(x-\bar{x})^2}{n-1}} = \sqrt{\frac{8745.77}{143}}$$

$$= \frac{295.0454}{143} = 2.0677$$

$S = 2.0678$

$s^2 = 4.275$

$$SE = \frac{S}{\sqrt{n}} = \frac{2.0626}{\sqrt{144}} = 0.1723$$

t-test

$$t = \frac{m - \mu}{\frac{s}{\sqrt{n}}} = \frac{-0.60806 - (-0.4115)}{0.1723} = -1.5618$$

$d.f = n-1 = 144-1 = 143$

independent t-test for 2 sample

$$t = \frac{\bar{x}_1 - \bar{x}_2}{s\sqrt{\frac{2}{n}}} = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

$$= \frac{-0.64284 - (-0.68060)}{\sqrt{\frac{5.4373}{137} + \frac{4.2749}{144}}}$$

$$= \frac{0.03776}{0.26334} = 0.143362$$