Population formula → preference

σ ← Standard deviation

Varrance $= \sigma^2$

Population size (N) = 452

Min = -5 Max = 5 R = 10

total size in table = 452

$$\text{mean} = M = \frac{\sum x_i}{N} = \frac{-186}{452}$$

$$= -0.4115$$

mean (M) = -0.4115

median = 0

mode = 0

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

Male graph for preference

Normal Distribution
Mean $\bar{x} = -0.642384$ $\bar{x} = \frac{\Sigma x}{n} = \frac{-88}{137} = -0.6423...$
Median = 0
mode = 0

Sample size (n) = 137
degree of freedom (d.f) = n-1 = 137-1 = 136
Sum = -88
α = 95% or 0.05
S = 2.338404
S^2 = 5.437

$$S = \sqrt{\frac{(x-\bar{x})^2}{n-1}} = \sqrt{\frac{317.1253}{136}} = 2.3384$$

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

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

t-test = -1.1587

min = -5
max = 5
R = 10

Female graph for preference $n = 144$

normal distribution $\quad Sum = -99$

mean: $\bar{x} = -0.6806 \quad \bar{x} = \frac{\Sigma x}{n} = \frac{-99}{144} = -0.68$

mode = 0

median = 0

$\alpha = 0.05$ or 95%.

min = -5

max = 5

R = 10

$S = \sqrt{\frac{(x-\bar{x})^2}{n-1}} = \sqrt{\frac{874.5.77}{143}}$

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

S = 2.0677

$S^2 = 4.275$

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

t-test

$t = \frac{m-M}{\frac{S}{\sqrt{n}}} = \frac{-0.6806 - (-0.4115)}{0.1723} = -1.5618$

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

independent t-test for 2 sample (Preference)

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

$$= \frac{-0.64284 - (-0.6806)}{\sqrt{\frac{5.4373}{137} + \frac{4.2749}{144}}}$$

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

Population formula for competence

σ ← Standard deviation

Varrance $= \sigma^2$

Sum $= -173$

Population size (N) $= 452$

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

total size in table $= 452$

$$\text{mean} = M = \frac{\sum x_i}{N} = \frac{-173}{452}$$

$$= -0.38274336$$

mean (M) $= -0.38274$

median $= 0$

mode $= 0$

$$\sigma = \sqrt{\frac{\sum (x_i - M)^2}{N}} = \sqrt{\frac{1642.78\,3412}{452}} = 1.9064$$

Male graph for competence

Normal Distribution

Mean $\bar{x} = -0.6715$ $\quad \bar{x} = \frac{\Sigma x}{n} = \frac{-92}{137} = -0.6715\,3285$

Median = 0

mode = 0

Sample size (n) = 137

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

Sum = −92

α = 95% or 0.05

$S = 1.9930$

$S^2 = 3.9722$

$$S = \sqrt{\frac{(x-\bar{x})^2}{n-1}} = \sqrt{\frac{540.218924}{136}} = 1.4930$$

$$\text{Standard error (SE)} = \frac{S}{\sqrt{n}} = \frac{1.9920}{\sqrt{137}} = 0.170277$$

$$t\text{-test} \quad t = \frac{m-M}{\frac{S}{\sqrt{n}}} = \frac{-0.6715-(-0.88274)}{0.170277} = -1.6960$$

t-test = −1.6960

min = −5

max = 5

R = 10

Female graph for competence $n = 144$

normal distribution

$\text{Sum} = -69$

mean $\bar{x} = -0.4792$ $\quad \bar{x} = \frac{\Sigma x}{n} = \frac{-69}{144} = -0.47966..$

mode = 0

median = 0

$\alpha = 0.05$ or 95%.

min = -5

max = 4

R = 10

$S = \sqrt{\frac{(x-\bar{x})^2}{n-1}} = \sqrt{\frac{373.9375068}{143}}$

$= 1.6171$

$S = 1.6171$

$S^2 = 2.6149$

$SE = \frac{S}{\sqrt{n}} = \frac{1.6171}{\sqrt{144}} = 0.134757$

t-test

$t = \frac{m - M}{\frac{S}{\sqrt{n}}} = \frac{-0.4792 - (-0.38790)}{0.134757} = -0.71556$

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

independent t-test for 2 sample

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

$$= \frac{-0.6715 - (-0.479167)}{\sqrt{\frac{3.9721984}{137} + \frac{2.61495}{144}}}$$

$$= \frac{-0.192366}{0.21715} = -0.885873$$