

Conditions

The Independent-sample t-test

Is there any evidence that leadership style (as measured by the amount of controlling behavior) differs between principals in urban and rural areas in Oromia? Data are provided below:

Urban: 78.56	Rural: 69.60
s = 16.7	s = 19.31
n = 9	n = 10

Solution

The t-stats for independent-sample t-test is:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{S_{\bar{X}_1 \bar{X}_2} \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}},$$

$$S_{\bar{X}_1 \bar{X}_2} = \sqrt{\frac{1}{2} (S_{\bar{X}_1}^2 + S_{\bar{X}_2}^2)}$$

$$S_{\bar{X}_1}^2 = \frac{\sum_{i=1}^{n_1} (X_i - M_1)^2}{n_1}$$

$$S_{\bar{X}_2}^2 = \frac{\sum_{i=1}^{n_2} (X_i - M_2)^2}{n_2}$$

$$t = \frac{8,96}{8,29} = 1,08$$

The degrees of freedom:

$$k = 22 - 2 = 20$$

The t-criterion value is 2.5668 (for p=0.95).

As our t is lesser, than t-criterion value, so the null hypothesis is approved.

Answer: YES