Free data research paper sample

Politics, Democracy

Inference Concerning Mean Differences

Using statistical testing it is possible to make inferences concerning the mean difference of two samples (Black, 100). For this exercise, the mean difference for mock SAT results and real SAT scores will be compared. Using Excel a t test will be carried out in order to compare the mean mock SAT score and the mean real SAT score in order to determine whether there is a statistically significant difference in the two samples.

The dataset utilized for this exercise is shown below.

Assumptions:

There are two assumptions that will be made before the t test is carried out in excel. These are:

- The distribution of the population is normal (Black, 45)
- Variance of the samples are assumed to be equal (Black, 45)

Hypothesis formulation:

H0: The mean difference between scores on mock SAT and real SAT is equal to zero

(Md = 0)

Hnull: The mean difference between scores on mock SAT and real SAT is not equal to zero

(Md ≠ 0)

Where Md is the mean difference between scores on mock SAT and real SAT

Excel Output:

Below is the excel output for the results obtained from the t-Test: Paired Two Sample for Means carried out.

Analysis

One tail test

The one tail test is utilized to test the relationship between the means in one direction. The value of p (one tail) is given as t (1. 739607) = 0. 142964, p> 0. 05. From examining the confidence interval, it is clear that zero is included within the confidence interval. The value of alpha (α) is 0. 05. As the value of alpha is less than the value of p (0. 142964 > 0. 05) and the confidence interval includes the value of zero the null hypothesis for this study is accepted. This indicates that there was no significant difference between the two groups. This implies that the mock and real scores do not have a significant mean difference at the 5% significance level. Furthermore, given degrees of freedom of 17 and α = 0. 05 the relevant critical value for this one tailed test is t0. 05, 16 = 1. 739607. The t stat for the data set is equal to -1. 10175. The t stat value is less than the critical value (1. 739607 > -1. 10175). This indicates that there was no significant difference between the two groups. This implies that the mock and real scores do not have a significant mean difference at the 5% significance level (Jaggia and Alison, 320).

Two tailed test

The two-tail test is utilized to test the relationship between the means in both directions. The value of p (two tail) is given as t (2. 1098) = 0. 2859, p> 0. 05. From examining the confidence interval, it is clear that zero is included within the confidence interval. The value of alpha is 0. 05. As the value of alpha is less than the value of p (0. 2859 > 0. 05) and the confidence interval includes the value of zero the null hypothesis for this study is accepted. Furthermore, given degrees of freedom of 16 and α = 0. 05 the relevant critical value for this one tailed test is t0. 05, 16 = 2. 1098. The t stat for the data set is equal to -1. 10175. The t stat value is less than the critical value (2. 1098 > -1. 031) (Jaggia and Alison, 320). This indicates that there was no significant difference between the two scores collected. This implies that the mock and real scores do not have a significant mean difference at the 5% significance level.

Conclusion

In conclusion, from the above analysis the null hypothesis has been accepted. This implies that the mean difference between scores on mock SAT and real SAT is equal to zero. Therefore, it can be assumed that the difference between the mean mock SAT scores and the mean real SAT scores is not statistically significant at 5% level.

Work Cited

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