

SPSS Practice Problems – T-Test

1. An investigator predicts that individuals that fit the Type A Behavior Pattern (highly competitive and time conscious) will have higher scores on a questionnaire measure of need for achievement than individuals that fit the Type B Behavior pattern (absence of Type qualities). The investigator collects need for achievement scores from 10 Type A subjects and 10 Type B subjects. Higher scores reflect greater levels of need for achievement. Write the null and alternative hypotheses for testing this prediction. Please use SPSS to test the null hypothesis stated above. Please provide a sentence in APA format for a results section that states the conclusion the investigator is entitled to draw.

Type A	Type B
12	8
10	10
8	5
11	7
15	8
12	5
9	4
16	7
11	8
8	10

2. An investigator believes that families in Virginia have more children on average than the average number of children in the population of the United States. From census data the investigator knows that the mean number of children in the U.S. is 2.1 children. She draws a sample of seven families from the state of Virginia and obtains the number of children for each family. The data from this sample are presented below. Write the null and alternative hypotheses for testing the investigator's prediction. Please use SPSS to test the null hypothesis stated above. Please provide a sentence in APA format for a results section that states the conclusion the investigator is entitled to draw.

Scores for the seven families: 3, 6, 2, 0, 4, 6, 7

3. An investigator conducts a study to examine the benefits of psychotherapy for individuals with depression. Specifically, the investigator predicts that depressed individuals who receive psychotherapy in addition to drug therapy for depression will display significantly lower levels of depression than persons with a diagnosis of depression who receive only drug therapy. The investigator assigns 10 subjects to each of the two conditions stated above. After three months the investigator measures depression using a scale in which higher scores reflect higher levels of depression. Write the null and alternative hypotheses for testing the investigator's prediction. Please use SPSS to test the null hypothesis stated above. Please provide a sentence in APA format for a results section that states the conclusion the investigator is entitled to draw.

Psychotherapy plus drug therapy group: 23, 19, 16, 18, 15, 22, 16, 18, 19, 20
 Drug therapy only: 24, 27, 26, 28, 29, 24, 26, 25, 22, 28

4. The mean productivity rating for all employees at a company was 3.8 on a five point scale last year. This year you get ratings from a representative sample of fifteen employees from the Human Resource Management. Do the data from this sample provide evidence that employee productivity in the department of Human Resource Management is significantly higher than in the company as a whole? Write the null and alternative hypotheses for this problem. Please use SPSS to test the null hypothesis stated above. Please provide a sentence in APA format for a results section that states the conclusion the investigator is entitled to draw.

Scores: 4.1, 3.9, 3.5, 4.0, 4.4, 4.3, 4.2, 4.5, 3.9, 3.6, 4.2, 4.4, 4.1, 4.3, 4.2

Answers to SPSS t-test problems

1. HO: Type A individuals do not have significantly higher scores on Need for Achievement than Type B individuals.
H1: Type A individuals have significantly higher scores on Need for Achievement than Type B individuals.

Conclusion: Type A participants have significantly higher scores on Need for Achievement than Type B participants, $t(18) = 3.735, p < .05$.

2. HO: Families in Virginia do not have significantly more children on average than families in the population of the United States.
H1: Families in Virginia have significantly more children on average than families in the population of the United States.

Conclusion: The mean number of children for a sample of families in Virginia is significantly greater than the mean number of children for families in the population of the United States, $t(6) = 1.997, p < .05$.

3. HO: Depressed individuals who receive psychotherapy in addition to drug therapy do not display significantly lower levels of depression than depressed individuals who receive only drug therapy.
H1: Depressed individuals who receive psychotherapy in addition to drug therapy display significantly lower levels of depression than depressed individuals who receive only drug therapy.

Conclusion: Depressed individuals who receive psychotherapy in addition to drug therapy for depression displayed significantly lower levels of depression than persons with a diagnosis of depression who received only drug therapy, $t(18) = -6.814, p < .05$.

4. HO: The mean productivity rating for employees in Human Resource Management is not significantly higher than in the company as a whole.
H1: The mean productivity rating for employees in Human Resource Management is significantly higher than in the company as a whole.

Conclusion: The productivity scores for employees in the department of Human Resource Management are significantly higher than those for employees in the company as a whole, $t(14) = 4.145, p < .05$.