Statistical Analysis:

Before testing the data, I found the mean, median, mode, range, variance and standard deviation of the results from the tests for each color and I put the results in the following table.;

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Blue** | **Yellow** | **Orange** | **Green** |
| **Mean** | 8.9 | 8.8 | 10.9 | 8.3 |
| **Median** | 9 | 9 | 10 | 9 |
| **Mode** | 9 | 9 | 10 | 9 |
| **Range** | 8 | 4 | 11 | 10 |
| **Variance** | 3.395 | 1.534 | 7.083 | 5.296 |
| **Standard Deviation** | 1.843 | 1.239 | 2.661 | 2.301 |

**First Test:**

**Color Comparison**

The first tests that I performed in order to statistically analyze the data were 6 T-tests. These tests enabled me to compare the effectiveness of each color when in comparison to the other three other colors. I conducted tests comparing Blue and Yellow, Blue and Green, Blue and Orange, Yellow and Green, Yellow and Orange, and finally Orange and Green. The results from the tests are below.

Blue v. Yellow T-test

Step:

1. Ho= There is no statistically significant difference between the colors blue and yellow in regards to how effective they are in enhancing short term memory.

Ha = There is a statistically significant difference between the colors blue and yellow in regards to how effective they are in enhancing short term memory.

2. T-Value = 0.174 P-Value =. 08 DF = 30

3. After performing this first t-test, I am unable to reject my null hypothesis at the 5% level. The p value is larger than the .05 limit, therefore there is no statistically significant difference between the colors blue and yellow and how effective they are in enhancing short term memory.

Blue v. Green T- test

Step:

1. Ho = There is no statistically significant difference between the colors blue and green in regards to how effective they are in enhancing short term memory.

Ha = There is a statistically significant difference between the colors blue and green in regards to how effective they are in enhancing short term memory.

2. T-Value = .788 P-Value = .424 DF = 30

3. After performing this second test, I am unable to reject my null hypothesis at the 5% level. The p value is larger than the .05 limit, therefore there is no statistically significant difference between the colors blue and green and how effective they are in enhancing short term memory.

Blue v. Orange T-test

Step:

1. Ho = There is no statistically significant difference between the colors blue and orange in regards to how effective they are in enhancing short term memory.

Ha = There is a statistically significant difference between the colors blue and orange in regards to how effective they are in enhancing short term memory.

2. T-Value = -2.39 P-Value = .016 DF = 30

3. After performing this t-test, I am able to reject my null hypothesis at the 5% level. The small p value shows that statistically there is a significant difference between the colors blue and orange and how effective they are in enhancing short term memory.

Yellow v. Green T-test

Step:

1. Ho = There is no statistically significant difference between the colors yellow and green in regards to how effective they are in enhancing short term memory.

Ha = There is a statistically significant difference between the colors yellow and green in regards to how effective they are in enhancing short term memory.

2. T-Value = .741 P- Value = .453 DF = 30

3. After performing this t-test, I am unable to reject my null hypothesis at the 5% level. The p value is larger than the .05 limit, therefore there is no statistically significant difference between the colors yellow and green and how effective they are in enhancing short term memory.

Yellow v. Orange T-test

Step:

1. Ho = There is no statistically significant difference between the colors yellow and

orange in regards to how effective they are in enhancing short term memory.

Ha = There is a statistically significant difference between the colors yellow and

orange in regards to how effective they are in enhancing short term memory.

2. T-Value = -2.77 P-Value = .006 DF = 30

3. After performing this t-test, I am able to reject my null hypothesis at the 5% level.

The small p value shows that statistically the difference between the colors yellow and orange and how effective they are in enhancing short term memory is very significant.

Orange v. Green T-test

Step:

1. Ho = There is no statistically significant difference between the colors green and

orange in regards to how effective they are in enhancing short term memory.

Ha = There is a statistically significant difference between the colors green and

orange in regards to how effective they are in enhancing short term memory.

2. T-Value = 2.86 P-Value = .0044 DF = 30

3. After performing this t-test, I am able to reject my null hypothesis at the 5% level.

The small p value shows that statistically the difference between the colors green and orange and how effective they are in enhancing short term memory is very significant.

**Second Test:**

**Chi-Square**

The second test that I did was a chi square test. This was to designed to test if there was a connection between color and memory.

Step:

1. Ho = There is no connection between color and short term memory.

Ha = There is a connection between color and short term memory.

2.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Observed** | **Observed** | **Expected** | **Expected** | **((o-e) ^ 2)/e** | |
| **Color** | **Between 1** | **Between 11** | **Between 1** | **Between 11** | **Between 1** | **Between 11** |
|  | **and 10** | **and 20** | **and 10** | **and 20** | **and 10** | **and 20** |
| **Blue** | 14 | 2 | 12.75 | 6.93 | 0.123 | 3.507 |
| **Yellow** | 14 | 2 | 12.75 | 6.93 | 0.123 | 3.507 |
| **Orange** | 9 | 7 | 12.75 | 6.93 | 1.103 | 7.07 x10 ^ -4 |
| **Green** | 14 | 2 | 12.75 | 6.93 | 0.123 | 3.507 |

3. DF = 3 P- Value = 0.00039

4. This really small P value allows me to reject my null hypothesis at the 5% level. This shows statistically that there is a significant connection between color and short term memory.