**How to do the sign test.**

**Step 1 – collect data (example below)**

|  |  |  |
| --- | --- | --- |
| participant | Score 1 | Score 2 |
| P1 | 4 | 5 |
| P2 | 8 | 10 |
| P3 | 3 | 8 |
| P4 | 6 | 2 |
| P5 | 8 | 7 |
| P6 | 9 | 4 |
| P7 | 6 | 6 |
| P8 | 3 | 8 |
| P9 | 8 | 7 |
| P10 | 9 | 9 |
| P11 | 2 | 8 |
| P12 | 4 | 6 |

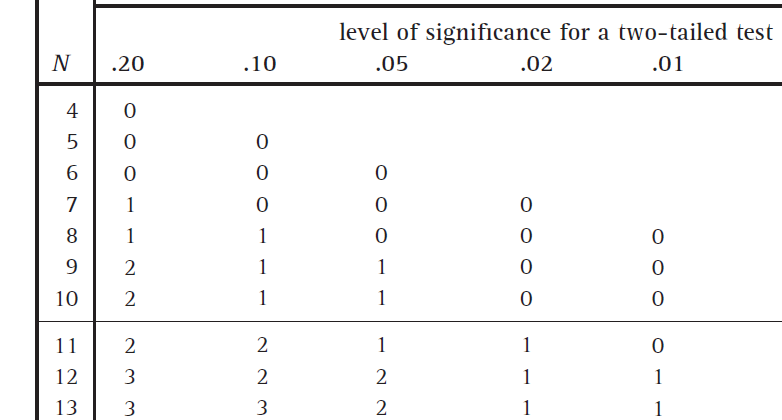
**Step 2 – Take away the second value from the first for each participant. This will leave you with a positive or negative value or 0. although shown here, you don’t need the actual value, just the sign**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| participant | Score 1 | Score 2 | Workings | difference | sign |
| P1 | 4 | 5 | 4 – 5 = | -1 | - |
| P2 | 8 | 10 | 8 – 10 = | -2 | - |
| P3 | 3 | 8 | 3 – 8 = | -5 | - |
| P4 | 6 | 2 | 6 – 2 = | +4 | + |
| P5 | 8 | 7 | 8 – 7 = | +1 | + |
| P6 | 9 | 4 | 9 – 4 = | +5 | + |
| P7 | 6 | 6 | 6 – 6 = | 0 | 0 |
| P8 | 3 | 8 | 3 – 8 = | -5 | - |
| P9 | 8 | 7 | 8 – 7 = | +1 | + |
| P10 | 9 | 9 | 9 – 9 = | 0 | 0 |
| P11 | 2 | 8 | 2 – 8 = | -6 | - |
| P12 | 4 | 6 | 4 – 6 = | -2 | - |

**Step 3 – you now need to find out how many + and –that you have**

+ = 4 - = 6

**Step 4 – the lowest value or either + or – is your calculated S score**

S = 4

**Step 5 – you now have to find your critical value. First find the value of N**

N is the number of participants where there is a difference. Discount all 0s

N = 12 – 2 = 10 (there are 12 participants in total but only 10 of them have a sign)

**Chose the level of significance for a two-tailed test at .05 and N = 10 to get the critical value (why you do this will become clear in year 2)**

Critical value = 1

**Step 6 – for a sign test, the calculated value must be less than or equal to the critical value for the result to be significant. Is this the case?**

No. The calculated value of 4 is greater than the critical value of 1, therefore we must reject the experimental hypothesis at p = 0.05 for a two-tailed test.

**Your turn. You have a non-directional hypothesis meaning it is a two-tailed test of significance (Year 2 work) and you want to support your experimental hypothesis with a 0.05 level of significance or more. In other words, you will only accept your experimental hypothesis if you are at least 95% confident that the results are not due to chance.**

**Your experimental hypothesis is. There will be a difference in people’s recall of one-syllable words if they take the test in the same room as they learned the words, or if they take the test in a different room to where they learned the words.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| participant | Score 1  (same room) | Score 2  (diff room) | difference | sign |
| P1 | 7 | 8 |  |  |
| P2 | 5 | 9 |  |  |
| P3 | 3 | 5 |  |  |
| P4 | 9 | 9 |  |  |
| P5 | 9 | 6 |  |  |
| P6 | 3 | 7 |  |  |
| P7 | 5 | 5 |  |  |
| P8 | 7 | 8 |  |  |
| P9 | 3 | 7 |  |  |
| P10 | 5 | 8 |  |  |
| P11 | 7 | 10 |  |  |
| P12 | 3 | 9 |  |  |
| P13 | 5 | 6 |  |  |
| P14 | 2 | 3 |  |  |
| P15 | 7 | 9 |  |  |

**Step 1 – work out the difference**

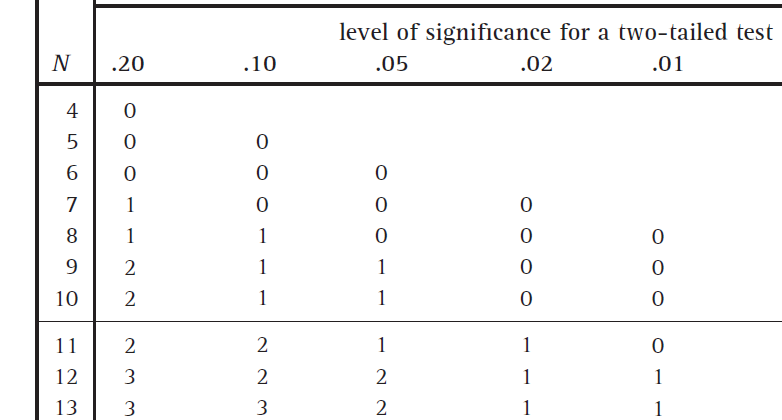
**Step 2 – record the sign of each difference**

**Step 3 – take the smallest number of signs as your calculated S score**

**Step 4 – work out N (number of participants minus number of 0s)**

**Calculated S score = \_\_\_\_\_\_\_**

**N = 15 - \_\_\_\_\_ = \_\_\_\_\_**



**Step 5 – now work out your critical value for a two-tailed test at a significance level of 0.05 with N = \_\_\_\_\_ Critical Value = \_\_\_\_\_\_\_\_\_**

**Step 6 – your calculated value must be equal to or less than the critical value. Is this the case?**

**Calculated S = \_\_\_\_\_ critical value = \_\_\_\_\_\_\_**

**I can support/reject the experimental hypothesis**

**Step 7 - Delete the appropriate words to make your conclusion**

**Because the calculated value of S is less than/greater than the critical value at p = 0.05 and N = 15/13 for a two tailed test, we can be at least 95% confident that the results are not due to chance so will support/reject the experimental hypothesis: there is a/no difference in people’s recall of one-syllable words if they take the test in the same room as they learned the words, or if they take the test in a different room to where they learned the words.**

**Further work: Do it again on this data**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **X** | 4 | 5 | 3 | 8 | 6 | 1 | 3 | 7 | 2 | 9 | 8 | 1 |
| **Y** | 5 | 5 | 7 | 9 | 9 | 3 | 7 | 9 | 2 | 5 | 9 | 2 |