**PSYC234: Lecture 6 post-lecture worksheet**

This worksheet is to help you consolidate what you learned during Lecture 6. It contains two activities.

This worksheet could be completed as part of the independent study hours for PSYC234. **It is optional but recommended**. **It is recommended that you complete this worksheet in advance of the WBA.**

Once you have finished, compare your answers to theanswer sheet provided on Moodle. You can also use this sheet and the answer sheet for revision purposes when preparing for the class test.

**Activity 1: Calculating test statistics manually**

**Wilcoxon rank-sum test**

You are a researcher interested in whether the number of cups of coffee drank affects how many admin tasks participants can get done in an hour. You assign to one of two conditions (drink 4 cups of coffee a day or drink 0 cups of coffee a day). After a week, you ask participants to come into the lab and ask them to complete a range of admin tasks. You count how many admin tasks they manage to complete. The data is below.

Use this data to calculate the test statistic manually:

1. First rank the data

|  |  |  |
| --- | --- | --- |
| **Group** | **Tasks completed** | **Rank** |
| **4 cups** | **5** |  |
| **4 cups** | **18** |  |
| **4 cups** | **14** |  |
| **0 cups** | **6** |  |
| **0 cups** | **4** |  |
| **0 cups** | **17** |  |
| **0 cups** | **14** |  |

1. Sum the ranks

* 4 cups =
* 0 cups =

1. Calculate the mean rank

* 4 cups =
* 0 cups =

1. Calculate the sum of ranks minus mean rank

* 4 cups =
* 0 cups =

1. What is the test statistic?

* Test statistic =

1. What might R report as the test statistic and why?

**Wilcoxon signed-rank test**

You are a researcher interested in whether a reading intervention helps children. You assess children’s reading skills and then give them all an intensive reading intervention. You then measure their reading abilities again.

Use this data to calculate the test statistic manually

1. Calculate the difference between “Before intervention” and “After intervention”
2. Note whether the difference is positive or negative
3. Rank the difference

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Before intervention** | **After intervention** | **Difference** | **+ or -** | **Rank** |
| 23 | 27 |  |  |  |
| 34 | 34 |  |  |  |
| 67 | 91 |  |  |  |
| 65 | 67 |  |  |  |
| 21 | 44 |  |  |  |

1. Next, add up positive ranks and negative ranks:
   * Positive ranks:
   * Negative ranks:
2. What is the test statistic (T)?

* T =

1. R reports a test statistic “V” instead of R. What might V equal to? Why might V equal to two values?

* V = \_\_\_\_\_ or \_\_\_\_\_\_
* Why might V equal to two values?

**Activity 2: Interpreting R output**

Interpret the following R output. Part 1 uses an independent groups design. Part 2 uses a repeated measures design. Please note, this data is different to that used in Activity 1 (so the test statistics will be different).

**Part 1: An independent groups design**

**1A: Testing the assumption of normality**

**Chart, line chart, scatter chart

Description automatically generated**

**Interpretation:**

**1B: Interpret the descriptive statistics and the model output**

Descriptive statistics:

A picture containing calendar

Description automatically generated

Model output:

Text

Description automatically generated

**What can we conclude? Report in APA format.**

**How was the p-value calculated?**

**Part 2: A repeated measures design**

You are a researcher interested in whether the amount of chocolate eaten is different before and after the participant goes a diet.

**2B: Testing the assumption of normality**

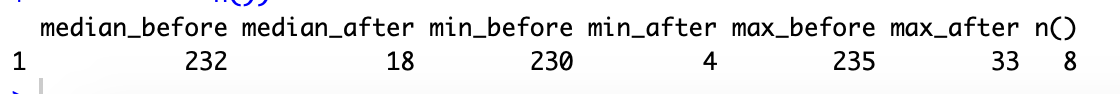
Chart, scatter chart

Description automatically generated

**What can we conclude?**

**2B: Interpret the descriptive statistics and the model output**

Descriptive statistics:

****

Model output:

Text

Description automatically generated

**What can we conclude? Report in APA format.**

**What method was used to calculate the p-value?**