

University of Wales Trinity Saint David

Exploring the relationship between the recall of long and short words using the Wilcoxon signed ranks test.

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Abstract

This report will follow an experiment that was carried out in order to determine whether short or long words are better recalled. The experiment took place in the controlled setting of a laboratory. The experiment included 24 participants, each were given a consent form before the experiment to understand the procedure, rules and regulations surrounding. Each participant was also given a debrief form at the end of the experiment.

The method consisted of asking each participant a series of short and long words over a 90 second span and a 1 second blank screen pause in-between words, in order to gain knowledge of whether long or short words were recalled better. A Wilcoxon signed ranks test was carried out to determine this. From the results obtained it was found that the value of 'W' was calculated as the smaller value of 'W+' and 'W-', therefore $W = 2$. The critical value of this specific experiment was 81. This meant that there is a significant difference in the recall of long and short words.

Introduction

An experiment was conducted in order to understand the relationship between the recall of long and short words. The recall experiment conducted is a type of memory exercise which tests for verbal span (Brain C,2022). This experiment was created to determine whether the hypothesis of long words is recalled better than short words as some previous studies have found this to be the result (Katkov M,2014).

To obtain whether long or short words were recalled better, a Wilcoxon signed rank test was carried out to determine the result. This type of test is a non-parametric. The Wilcoxon test is split over seven columns containing the following in chronological order: participant, long words, short words, difference, order, rank, and sign (Harry P,2021).

Memory recall is a life skill that is used in everyday life situations and therefore this experiment is academically credited in the understanding of how the human brain interacts with word recall collected from different human subjects (Meteviar A,2021)

Methodology

Design

The design of this study was to determine whether the human brain recalls long or short words more efficiently. A Wilcoxon signed ranks test was used in order to determine this.

Participants

24 adult participants took part in this experiment, there was no specific gender or age for these participants to take place in this experiment.

Apparatus/materials

- Consent forms for each participant to understand the experiment, rules, and regulations.
- Debrief forms for each participant to be handed out at the end of the experiment to conclude everything that has happened and taken place in this experiment to ensure the participant has a fully aware understanding.
- A controlled setting- laboratory, to conduct this experiment without any other distractions.
- A power point of short words to be presented over a 90 second time span with a 1 second blank screen slide in-between each word that was presented.
- A power point of long words to be presented over a 90 second time span with a 1 second blank screen slide in-between each word that was presented.
- Wilcoxon signed rank test with 24 rows for each participants information to be filled out after the experiment is conducted

Procedure

The procedure of this experiment firstly started with gathering 24 participants of no specific age or gender. Before the experiment started each of these participants were individually given a consent form that needed to be acknowledged and signed by the willing participant in order to continue with the experiment. The consent forms entailed of exactly what the experiment will conclude of and the rules and regulations surrounding it. Once the total number of consent forms were received back and signed, the experiment can now begin.

The 24 participants were then led to a controlled setting, which in this case a laboratory was used to conduct the following experiment in order to obtain the result in whether short or long words are better recalled. Next a presentation was shown to the 24 participants in a slide format over a 90 second span. The first collection of slides that was shown was long words that were presented on a one second slide and had a one second blank slide after each word. The second collection of slides that were shown to the participants were the short words which were presented in the exact same style and time as the long words.

After the long words were presented, each participant was asked to recall the words that they could remember, this was written down by the participants and considered. The same procedure occurred when presenting the short words. After collecting the data from the test, the numbers were then categorised into a Wilcoxon signed ranks test in order to prove whether short or long words were better recalled.

After the experiment was carried out, each one of the participants were made aware clearly that this was just an experiment and will not affect their day-to-day lifestyle. The participants were completely debriefed after the experiment and given debrief forms so that they could understand fully what had just happened within the experiment and to make sure they were still happy to have their numerical data participate in the results obtained from the experiment.

Results

A Wilcoxon signed ranks test was conducted at the end of the recall experiment to determine whether long or short words are recalled better. In the test the value of W was computed as the smaller value of W^+ and W^- , for that reason $W=2$. In comparison with the critical values table, it was discovered that there is a significant difference between the recall of long and short words. From the results obtained, the clear definition of the experiment conducted is that short words are better recalled, simply because they are easier to remember than a longer word that could consist of more syllables.

References

Brain connection. (2022). *Word list recall*. Accessed on 20/02/2022. (Available at: [Word List Recall - Brain Connection \(brainhq.com\)](https://brainhq.com/word-list-recall/)).

Harry P (2021). *Wilcoxon signed ranks test*. Accessed on 20/02/2022. (Available at: [Wilcoxon Signed Rank Test - GeeksforGeeks](https://www.geeksforgeeks.org/wilcoxon-signed-rank-test/)).

Katkov M. (2014). *Word length effect in free recall*. Accessed on 20/02/2022. (Available at: [Document.docx - Microsoft Word Online \(live.com\)](#)).

Metiviar A. (2021). *Memory recall and retrieval*. Accessed on: 20/02/2022. (Available at: [Memory Recall and Retrieval: The Definitive Guide \(magneticmemorymethod.com\)](https://magneticmemorymethod.com/memory-recall-and-retrieval/)).

Appendices

<u>p</u>	<u>Long w</u>	<u>Short w</u>	<u>Difference</u>	<u>Order</u>	<u>Rank</u>	<u>sign</u>
<u>1</u>	<u>5</u>	<u>8</u>	<u>-3</u>	<u>1</u>	<u>2</u>	<u>2</u>
<u>2</u>	<u>5</u>	<u>7</u>	<u>-2</u>	<u>-1</u>	<u>2</u>	<u>-2</u>
<u>3</u>	<u>5</u>	<u>4</u>	<u>1</u>	<u>-1</u>	<u>2</u>	<u>-2</u>
<u>4</u>	<u>2</u>	<u>6</u>	<u>-4</u>	<u>-2</u>	<u>5.5</u>	<u>-5.5</u>
<u>5</u>	<u>4</u>	<u>7</u>	<u>-3</u>	<u>-2</u>	<u>5.5</u>	<u>-5.5</u>
<u>6</u>	<u>2</u>	<u>5</u>	<u>-3</u>	<u>-2</u>	<u>5.5</u>	<u>-5.5</u>
<u>7</u>	<u>4</u>	<u>9</u>	<u>-5</u>	<u>-2</u>	<u>5.5</u>	<u>-5.5</u>
<u>8</u>	<u>3</u>	<u>4</u>	<u>-1</u>	<u>-3</u>	<u>10</u>	<u>-10</u>
<u>9</u>	<u>4</u>	<u>5</u>	<u>-1</u>	<u>-3</u>	<u>10</u>	<u>-10</u>
<u>10</u>	<u>5</u>	<u>7</u>	<u>-2</u>	<u>-3</u>	<u>10</u>	<u>-10</u>
<u>11</u>	<u>4</u>	<u>6</u>	<u>-2</u>	<u>-3</u>	<u>10</u>	<u>-10</u>
<u>12</u>	<u>3</u>	<u>8</u>	<u>-5</u>	<u>-3</u>	<u>10</u>	<u>-10</u>
<u>13</u>	<u>3</u>	<u>9</u>	<u>-6</u>	<u>-4</u>	<u>15</u>	<u>-15</u>
<u>14</u>	<u>3</u>	<u>8</u>	<u>-5</u>	<u>-4</u>	<u>15</u>	<u>-15</u>
<u>15</u>	<u>4</u>	<u>7</u>	<u>-3</u>	<u>-4</u>	<u>15</u>	<u>-15</u>
<u>16</u>	<u>2</u>	<u>8</u>	<u>-6</u>	<u>-4</u>	<u>15</u>	<u>-15</u>
<u>17</u>	<u>3</u>	<u>9</u>	<u>-6</u>	<u>-4</u>	<u>15</u>	<u>-15</u>
<u>18</u>	<u>3</u>	<u>7</u>	<u>-4</u>	<u>-5</u>	<u>19.5</u>	<u>-19.5</u>
<u>19</u>	<u>4</u>	<u>8</u>	<u>-4</u>	<u>-5</u>	<u>19.5</u>	<u>-19.5</u>
<u>20</u>	<u>3</u>	<u>7</u>	<u>-4</u>	<u>-5</u>	<u>19.5</u>	<u>-19.5</u>
<u>21</u>	<u>2</u>	<u>7</u>	<u>-5</u>	<u>-5</u>	<u>19.5</u>	<u>-19.5</u>
<u>22</u>	<u>3</u>	<u>7</u>	<u>-4</u>	<u>-6</u>	<u>23</u>	<u>-23</u>
<u>23</u>	<u>4</u>	<u>6</u>	<u>-2</u>	<u>-6</u>	<u>23</u>	<u>-23</u>
<u>24</u>	<u>4</u>	<u>7</u>	<u>-3</u>	<u>-6</u>	<u>23</u>	<u>-23</u>

Study Consent Form

I understand that this research study is being carried out by a third-year dissertation study and that taking part in this study will involve me taking part in a cognitive computer-based task.

I understand that I must inform the researcher if I am unable to view colours (colour blind) as taking part in this study requires the ability to view colours.

This study will take approximately 15 minutes to complete.

I understand that participation in this study is voluntary, and I am free to withdraw participation during or at the end of the study without giving a reason. I understand that once I leave the study, I will not be able to withdraw my data, as it will be anonymised. I am aware that if I have concerns about the study, I can discuss these concerns with the researcher at any time during or after the study. I understand that I will be provided with the contact details of the research supervisor at the end of the study, should I have any concerns.

I understand that the information provided by me will be held confidentially, with a code assigned in place of my name. These data will be stored indefinitely in accordance with the Data Protection Act.

I also understand that at the end of the study I will be provided with a debrief form and the opportunity to discuss any issues with the researcher.

I, _____(NAME) consent to participate in the study conducted by put your name here, Centre for Psychology and Counselling, University of Wales Trinity Saint David, under the supervision of put supervisors name here.

Participant Signature: _____

Date: _____

Name and signature of researcher taking consent

Study Debrief sheet

Exploring the presence of the Stroop effect

Thank you for taking part in this study.

The aim of this study was to explore the difference in the recall of long and short words. It was specifically hypothesised that participants would be able to recall the shorter words better than the long words.

If you wish to withdraw yourself from this study then you must tell the researcher now, after this point all data will be anonymised, and we will be unable to trace it back to you.

If taking part in this study has raised any questions, please speak to your researcher on 2104485@student.uwtsd.ac.uk or contact the academic supervisor on stacey.coleman@uwtsd.ac.uk

Thankyou once again for participating in this study

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