**Results for Lab Experiment on Lexical Decisions – Fall 2017**

**Pooled Results for Plotting Graphs**

The pooled results for the 274 Hope students (173 females, 101 males) who participated in the Lexical Decisions experiment are presented in the tables below. The pooled results are presented in the same order as your own results on your data sheet, to help you plot the correct values on each graph. The values in the top table are the means for each condition.   
  
***RT*** *is Reaction Time (speed of responding in milliseconds, so lower values = faster performance).* ***PC*** *is Percent Correct (accuracy, so higher values = better performance).*

Mean for each condition

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **RT** | **Words** | **Nonwords** | *Overall* |  | **PC** | **Words** | **Nonwords** | *Overall* |
| **LVF** | 784.2 | 792.5 | *788.6* |  | **LVF** | 86.3 | 85.9 | *86.3* |
| **RVF** | 761.3 | 809.4 | *785.7* |  | **RVF** | 89.6 | 83.1 | *86.6* |
| *Overall* | *771.9* | *800.0* | *787.0* |  | *Overall* | *88.0* | *84.5* | *86.4* |

Standard Deviation for condition

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **RT** | **Words** | **Nonwords** | ***Overall*** |  |  |  | **PC** | **Words** | **Nonwords** | *Overall* |
| **LVF** | 194.0 | 192.7 | *186.4* |  |  |  | **LVF** | 11.8 | 13.7 | *9.9* |
| **RVF** | 192.2 | 195.9 | *183.2* |  |  |  | **RVF** | 11.2 | 14.7 | *10.2* |
| *Overall* | *185.9* | *187.8* | *181.6* |  |  |  | *Overall* | *9.6* | *12.6* | *9.1* |

**Statistical Analyses (testing for differences between means using paired t-tests)**

For the purposes of this experiment, the difference between trials using words and trials using nonwords is not very important (although it does appear that participants responded faster overall to the words than to the nonwords). The difference between trials presented to the Left Visual Field (LVF) and trials presented to the Right Visual Field (RVF) is much more interesting, because it relates to the theory of hemispheric differences in language processing. So, a series of "t-tests" was performed to compare the means for LVF and RVF trials.

There are two types of t-tests. ***Independent groups t-tests*** are used when we are comparing means from two different groups of people (such as males vs. females or left-handers vs. right-handers). This is also called a “between-subjects” comparison. ***Paired samples t-tests*** are used when we are comparing means from two different conditions for the same people (such as scores on Exam 1 vs. Exam 2 for students in the same course section). This is also called a “within-subjects” comparison. Because all of our participants (“subjects”) received trials in the LVF and RVF, we will use ***paired samples t-tests*** for this comparison.

When interpreting the results of a t-test, it is important to know whether we expected a difference in a particular direction (for example, if we predicted that Exam 2 scores would be higher than Exam 1 scores), or if we are simply checking to see if there is a difference between the two means in either direction. If our hypothesis is directional, we use a ***one-tailed t-test***. If we are testing for a difference in either direction, we use a ***two-tailed t-test***. In this experiment, previous research suggests that we should find better performance on trials presented to the Right Visual Field (going directly to the left hemisphere, which is specialized for language). This is a directional hypothesis, so we will use ***one-tailed t-tests***.  
  
*For each* ***paired samples t-test****, here is the****t-statistic****and the “one-tailed” probability (also called****p-value****or****significance level****) that a difference this large would have occurred by chance alone. The number in parentheses after the "t" is the* ***degrees of freedom (df)****, which is one less than the number of participants. Typically, pairs of means are considered significantly different if the****p-value****is less than .05. If a difference is “statistically significant,” you will need to look at the actual means in the table above to see the direction of the difference.*

Effect of Visual Field on RT

**LVF vs. RVF for Words**  
t(273) = 3.68, p < .001 (significantly faster responses to words in one of the fields)

**LVF vs. RVF for Nonwords**  
t(273) = -2.80, p = .0028 (significantly faster responses to nonwords in one of the fields)

Effect of Visual Field on PC

**LVF vs. RVF for Words**  
t(273) = 4.41, p < .001 (significantly higher accuracy for words in one of the fields)

**LVF vs. RVF for Nonwords**  
t(273) = -3.54, p < .001 (significantly higher accuracy for nonwords in one of the fields)