Measuring Reaction Time

Introduction

Reaction time describes the passage of time that elapses between the moment a person is given a sensory stimulus and the moment when the person initiates a motor response. In psychological testing, reaction time is used as an index of mental processing speed. These tests use reaction time as an indication of how quickly a subject can execute all of the mental operations required by a task. This speed of processing is used as a measurement of processing efficiency. Reaction time in these tests is a product of the speed of signal transduction between a sensory input and the motor output.

Aim

To determine the impact of different reaction conditions on the average reaction time of a participant

EXPERIMENT 1: Visual versus Auditory Stimulus

Visual Stimulus

- Go to the visual reaction time test: https://www.mindthatbear.com/tools/reaction-time-test
- Select 'Start test' and follow the instructions (click or press space when the screen turns green)
- Record individual data for the first five trials in the table below

Auditory Stimulus

- Go to the auditory test: https://www.mindthatbear.com/tools/auditory-reaction-time-test
- Select 'Start' and follow the instructions (click or press space upon sound of the beep)
- Record individual data for the first five trials in the table below

Stimulus	Reaction Time (milliseconds)						
	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Mean	St Dev
Visual							
Auditory							

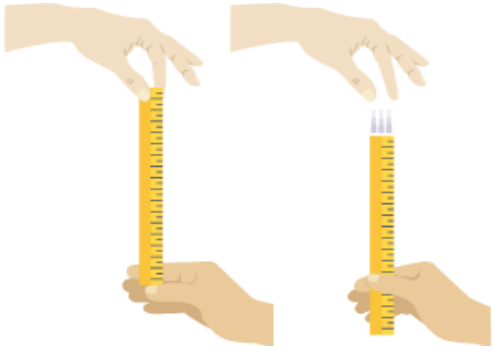
1. Which set of data is more precise? Suggest a reason why.

2. Perform a **paired** t-test to determine significance: https://www.graphpad.com/quickcalcs/ttest1/

EXPERIMENT 2: Self-Designed Experiment

Ruler Drop Test

- Person A holds 30cm ruler in a pincer grip at the 30cm end
- Person B positions their hand at the 0cm end of the ruler
- Person A randomly releases the ruler for Person B to catch
- The number at the top of Person B's thumb is recorded
- The process is repeated four more times (5 trials in total)
- Change an experimental variable and repeat experiment
    - Factors could include reciting the alphabet, listening to loud music or testing with the non-dominant hand



1. Identify the factor being altered in the self-designed experiment.

Personal Results

Condition	Drop Distance (millimetres)						
	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Mean	Std Dev
Control							
Variable							

Group Data

Condition	Drop Distance (millimetres)						
	Group 1	Group 2	Group 3	Group 4	Group 5	Average	Std Error
Control							
Variable							

2. Describe the trend seen in the self-designed experiment.

3. Distinguish between standard deviation and standard error.

4. Reaction time is calculated from drop distance using the mathematical equation: $t = \sqrt{2d \div 9.8}$. Compare the reaction times of the mean values in experiment 1 and 2. $(t = seconds, d = metres)$

5. Suggest one possible explanation for the differences seen in the results for experiment 1 and 2.