**Simple Reaction Time Lab**

**PSY 3860 – Human Performance**

Simple reaction time is the time needed to respond to a unitary stimulus, where there is one response and no decision to be made other than to respond. This applies to many real-world situations, but also it provides a lower bound on more complex decisions (choice), and we would expect that many of these same factors would apply to more complex speeded choice situations. In this lab, we will measure the time you take to respond to a simple stimulus (Simple Reaction Time). We will test this under several conditions to examine how these factors impact simple reaction time.

The testing script we will use gives us three options:

* Visual versus auditory (is the response an 'x' or a tone?)
* uncertain versus certain time (is delay between trials fixed or random?)
* variable intensity (is auditory or visual stimulus constant or variable in intensity?)

Each round will involve measuring your response time for 50 trials. When complete, basic results will be shown at the end of the test, and these results will be saved in data\subnum\srt-report-subnum.txt, for later reference. You should use participant names that indicate the condition you are in, and also save these report files to help you generate a lab report.

**1. Simple Reaction Time (Visual|Constant intensity|variable time uncertainty).** This round depicts maybe the most typical simple reaction time condition, in which the stimulus is visual, always the same intensity, and there is uncertainty in how long the stimulus appears after the warning signal (Warning Interval or WI). Do this task twice, recording your mean, median, and min RT both times.

* *Questions to answer in report:* 
  + How fast were you? How does this compare to published values and those discussed in class? Do you get faster or slower the second time? Why?

**2. Stimulus Modality.** Some researchers have reported faster simple reaction times to auditory stimuli than to visual. Run a round with **(Auditory|Constant intensity|variable time uncertainty).**  In the auditory task, time gets recorded from when the stimulus starts playingRecord mean, median, and min RT. Compare these to your results of part 1.

* *Questions to answer in report:*
  + Were your responses faster or slower than the visual condition?
  + What do you think might make it more or less difficult that visual?

**3. Expectancy.** The data collected so far involved random timing delays. As the delay increased, you probably came to expect the stimulus more. On the other hand, longer delays may have been more distracting. Did delays make you any faster, or any slower? Examine how mean response time in that round was impacted by the warning interval across all three runs. Look at the report file for the three tasks, and find the average RT for each delay condition.

* *Questions to answer for report:*
  + Create a graph showing how delay impacted response time.
  + Discuss how increased delay impacted response time.
  + Why do you think this happened?
  + Describe a situation outside the lab that this might matter.

**4. Uncertainty.** The previous rounds involved variable delays between the warning signal (the +) and the stimulus. What happens if that timing is highly predictable? Run two rounds; one visual and one auditory, in which you use **(Auditory|Constant intensity|constant time uncertainty) and**  **(Visual|Constant intensity|constant time uncertainty). Try to respond as quickly as possible, even if this means anticipating when the stimulus would be presented).** Record mean/median/min RT for each condition.

* *Questions to answer for report:*
  + Compare each condition to the variable-time uncertainty round you conducted earlier.
  + Discuss whether you were able to reduce the response time in these conditions, and how/why you were able to do this.
  + Look at the 'too fast' indicator—how often were you able to respond faster than should be possible?
  + Describe a situation outside the lab for which this might matter.

**5. Stimulus intensity.** Both the auditory and visual stimuli allow you to use variable intensity. Run two final rounds, using **(Auditory|variable intensity|variable time uncertainty) and**  **(Visual|variable intensity|variable time uncertainty).** Record mean/median/min time for each. Examine how mean RT changes in each case with stimulus intensity.

* *Questions to answer for report:*
  + Create a graph showing stimulus intensity vs. mean RT for both conditions
  + If possible, add trend lines to look at whether the RT increases or decreases with intensity.
  + Discuss what you found and what it means for design of warnings/alerts.

**Choice RT and the Hick-Hyman Law**

Perform the Hick-law demonstration using the PEBL hicks task. This should take 5-6 minutes. When complete, obtain the data, and produce a graph of number of options vs. mean RT.

* *Questions to answer for report*
  + How did your data compare to those produced by Hick in the 1950s?
  + What would you predict your RT would be if you had to choose between 16 options?
  + Discuss ways in which this relationship might break down for more complex choice situations, such as picking a breakfast cereal, hiring a job candidate, or something similar.