

Experiment HP-15: Hypothesis-driven Prepulse Inhibition Lab/Research Study

This lab is meant to be a “hypothesis-driven” lab where students will come up with a series of sounds that they would like their subject to listen to order to elicit the subject's Prepulse Inhibition to a startle stimulus. The settings file for this lab is currently set up to record: EOG only. However, Pulse, Skin Conductance, Blood Pressure, Respiration, Body Temperature, Heart Rate and Breathing Rate can all be parameters students may want to study. These parameters can be added or removed based on what the goal of the hypothesis is. Students may also want to try using images rather than sounds to elicit the startle responses.

Having a second computer monitor is best to perform this lab; however, the subject can also stare at a blank screen or a blank white/black board. If using images rather than sounds, a second monitor is a necessity.

Sample Exercise: Measuring the Startle Effect Before and After a Prepulse Stimulus

Aim: To measure the subject's startle reaction before and after presentation of a prepulse stimulus.

Procedure

1. Select one person from your group to be the subject.
2. Connect the EOG electrodes as stated in the set up document.
3. Drape the positive (red) and negative (black) electrode leads over the subject's ear. Drape the ground (green) lead over the head. Make sure the leads do not block the subject's view of the screen.

Note – if using other sensors, see below, and attach them prior to starting the experiment. Make sure to add the necessary data collection channels in Edit – Preferences.

4. Click on the Record button. Enter the subject's name in the Mark box and press the Mark button to the left of the mark box.
5. Have the subject blink a few times in a row to make sure that the electrodes are set up correctly. The recording will look like the data shown in ([Figure HP-15-L1](#)).
6. Click Stop to halt the recording.
7. Select Save As in the File menu, type a name for the file. Choose a destination on the computer in which to save the file, like your lab group folder. Designate the file type as *.iwxdata. Click on the Save button to save the data file.
8. Click the Startle sequence in the Sequence menu on the toolbar.
9. Click the Record button. This will play a short startle sound to elicit the startle response.
 - If the “startle” sound is not played – click Run Sequence. A mark will automatically be made on the screen when the sound is played.

10. Immediately click Stop and Save your recording.
11. Click the Prepulse sequence in the Sequence menu on the toolbar.
12. Click the Record button. This will play a prepulse sound and then a startle sound.
 - If the “prepulse” sound is not played – click Run Sequence. A mark will automatically be made on the screen when the sounds are played.
13. Click Stop and Save your recording.

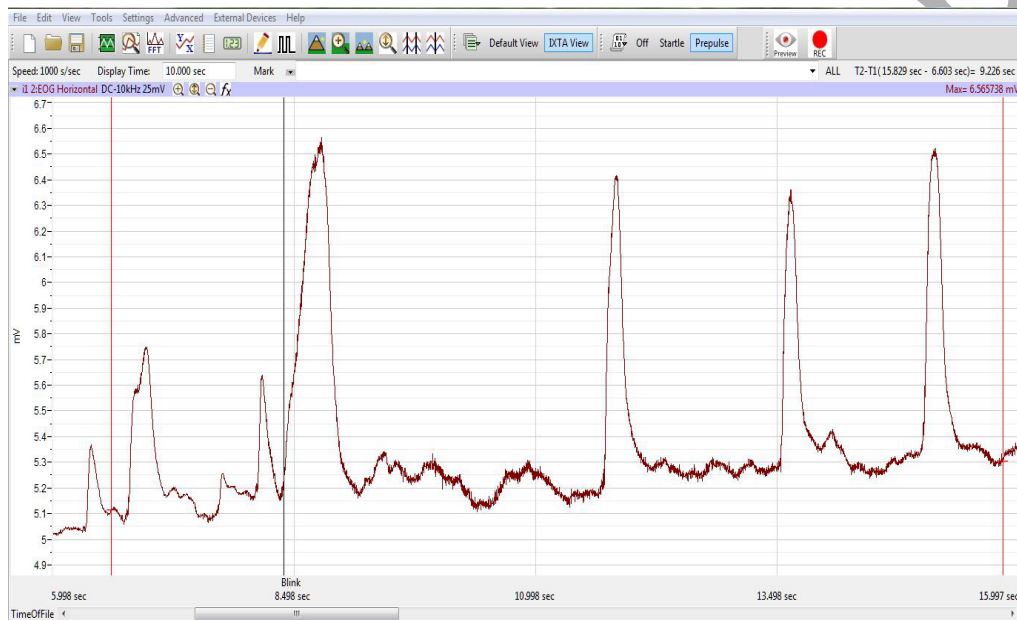


Figure HP-15-L1: Eye blink recording to test the electrode connections.

Attaching other sensors.

- For Pulse and Heart Rate - Attach the Pulse sensor to the volar surface of the subject's left thumb. Make sure it is not too tight or too loose. Set up the calculated Heart Rate channel as well.
- For GSR - Attach each GSR electrode to the volar surface of the distal finger segment of two non-adjacent fingers; the index and the ring fingers are the ones usually used. Attach the electrodes with the Velcro straps so that the straps are snug, but not overly tight. You may need to slightly moisten the finger tips for good conduction.
- For Skin Temperature - Attach the Temperature sensor to the back of the subject's hand with a small piece of paper tape.
 - The subject should rest his or her hand with the sensors attached comfortably. The GSR electrodes should be free from any extraneous pressure and the electrode cable should be hanging freely. Instruct the subject not to move the hand during the recording process; movement may introduce artifacts into the recording.
- For Respiration and Breathing Rate - Strap the RM-204 respiration monitor to the subject's

chest. Set up the calculated Breathing Rate channel as well.

14. Repeat this exercise on other subjects in your lab group.

Data Analysis

1. Scroll through the data file and locate the recording of the subject's eye blinks. You should notice a spike on the screen every time the subject blinked. You can measure the maximum amplitude of the blink by placing the cursors on either side of the eye blink on the EOG channel and reading Max from the value on the right side of the graph.
2. Record a few of these values and calculate the mean.
3. Scroll through the data to the section where the "Startle" stimulus was played.
 - Click the down arrow to the right of the Mark button and click on "Startle" to show this section of data on screen ([Figure HP-15-L2](#)).
 - Clicking the Zoom between Cursors button on the LabScribe toolbar will expand or contract the recording to the width of the Main window.

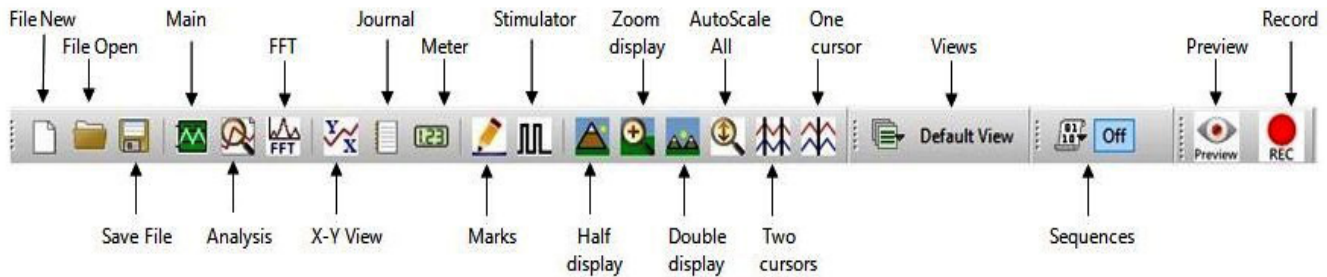


Figure HP-15-L2: The LabScribe toolbar.

4. Place one cursor directly on the "Startle" mark and place the other cursor on the beginning of the eye blink (when the subject was startled by the stimulus). Read T2-T1 to get the time it took from the startle sound to the eye blink ([Figure HP-15-L3](#)).
5. Measure the maximum amplitude of the eye blink as stated in step #1. Record both T2-T1 and Max values for the "Startle" stimulus.
6. Move the cursors to the section of data where the Prepulse sequence was played.
 - Click the down arrow to the right of the Mark button and click on "Startle" to show this section of data on screen ([Figure HP-15-L2](#)).
 - Clicking the Zoom between Cursors button will the LabScribe toolbar to expand or contract the recording to the width of the Main window.

7. Place one cursor directly on the Prepulse mark and place the second cursor 120 msec from the first cursor. T2-T1 will show 120 msec; use your right and left arrow keys on the keyboard to get the time exactly to 120 msec ([Figure HP-15-L4](#)).
8. Moving the left-hand cursor only, place this cursor on the beginning of the eye blink (when the subject was startled by the stimulus). Read T2-T1 to get the time it took from the startle sound to the eye blink when the prepulse stimulus was played.
9. Measure the maximum amplitude of the eye blink as stated in step #1. Record both T2-T1 and Max values for the “Prepulse” stimulus.
9. If other data, such as Pulse and Heart Rate are being recorded, the data can be selected and analyzed in the same way.

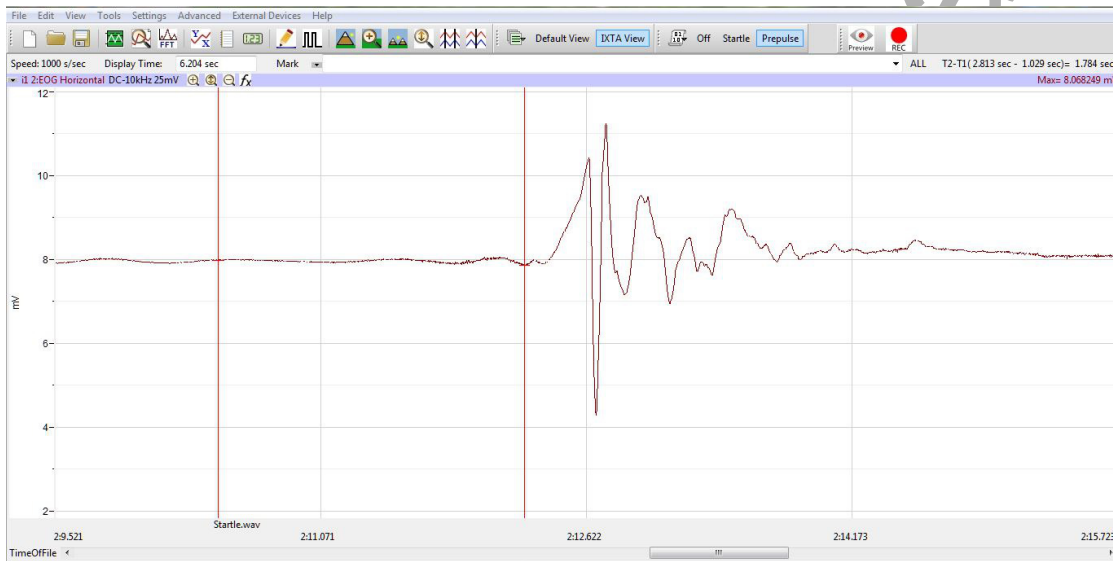


Figure HP-15-L3: Startle reaction without the prepulse. Cursors are in position to measure T2-T1.

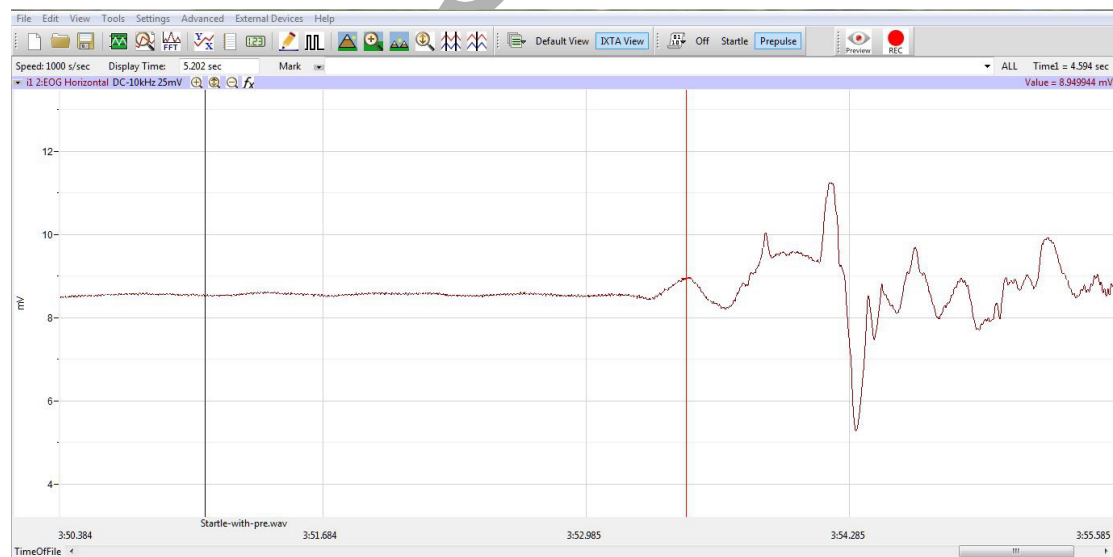


Figure HP-15-L4: Startle reaction with a prepulse stimulation. Cursor is on the beginning of the smaller reaction.