Experiment HP-20: Relaxation & Music ~ Lab/Research Study

Equipment Required

PC or Mac Computer

IXTA, USB cable, power supply

*C-GSR-320 electrodes

*PPG-320 Pulse plethysmograph

*RM-220 Nasal Cannula

*** - these are all optional test parameters**

1. Select one person from your group to be the subject. Ask the subject to go to the sink, wash their hands with soap and water, and dry them thoroughly. Washing the hands insures that surface oils or other substances, which might lower skin conduction, are removed. *Do not use alcohol to clean the fingers, alcohol dehydrates the skin.*
2. Connect the GSR electrodes as stated in the set up document.
3. Connect the pulse sensor and respiration monitor as outlined in the set-up procedure.
4. Using the non-dominant hand, 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 will need to rub some GSR conductive paste into the finger tips for good conduction.

Sensor Setup

1. Locate the PPG-320 pulse plethysmograph and plug it into the PT port. Place the pulse sensor on the subject's middle finger of the non-dominant hand.
2. Locate the C-GSR-320 electrodes. Plug it into the GSR port.
    - **Note – the GSR unit is precalibrated. No other calibration is needed.**
    - Attach the GSR electrodes to the pointer and ring finger of the subject's hand. Make sure the fingers are not too cold or too dry. Moisten them GSR conductive paste.

IWorX Sample Lab

Figure HP-20-S1: The IXTA with the PPG-320 and GSR cables.

3. Locate the RM-220 nasal cannula and plug the connector into channel A1 on the front of the IXTA unit.
    - Position the cannula so the prongs are just resting under the subject's nose, very close to the nostrils. Wrap the tubing behind the subject's ears, as shown above.
    - If the subjects are sitting during these exercises, they should sit erect so that the muscles involved in pulmonary ventilation are able to move with few restrictions.
    - Stop the experiment if the subject feels dizzy or nauseated.

iWorx Sample

Figure HP-20-S2: RM-220 Nasal cannula.

IWorX Sample Lab

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This lab is meant to be a lab where students will determine how they want to test a study that has already been completed by someone else. Students can choose to test baseline against relaxing music; one relaxation song against another; provide a subject with a known stress-inducing situation and then record data while being stressed and then while being stressed and listening to one of the songs; or any other hypothesis about how the music can lessen stress.

Sample Exercise: Measuring Pulse, Heart Rate, Galvanic Skin Response, Respiration and Breathing Rate Before and While Listening to "Weightless" by Marconi Union

Aim: To measure the subject's skin conductance, heart rate and breathing rate before and while listening to relaxing music.

Approximate Time: 30 minutes or more

Procedure

1. The subject should rest their 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.
2. Connect headphones to the computer audio jack. This is recommended to get the best out of the music.
3. Click on the Record button. Enter the **Baseline subject's name** in the Mark box and click the mark button. Since the GSR amplifier is already precalibrated, the value displayed on the Skin Conductance Level channel is the baseline skin conductance level (SCL) of the subject. Record the subject's baseline SCL for approximately five minutes until the recording stabilizes.
4. Click Stop to halt the recording.
5. Select Save As in the File menu, type a name for the file. Click on the Save button to save the data file.

IworX Sample Lab

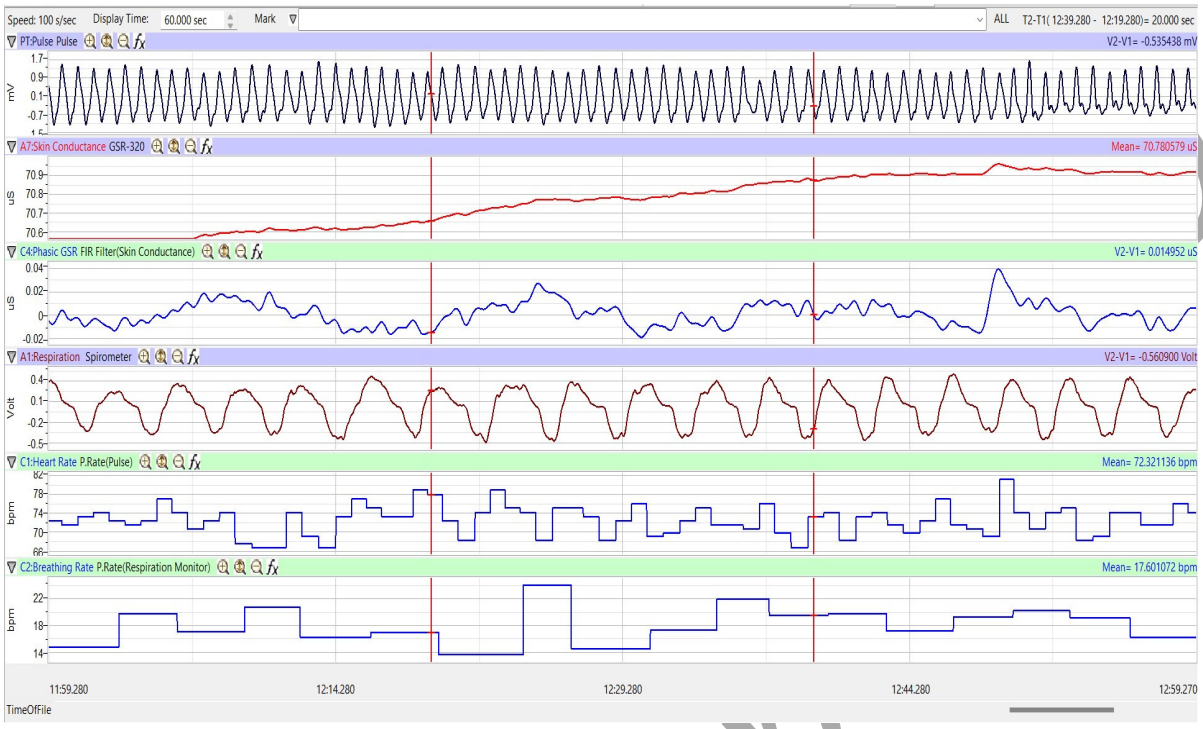

Figure HP-20-L1: Sample data for relaxing music trial

12. Click Record and have the subject start listening to one of the songs chosen from the list.
    - Weightless - https://www.youtube.com/watch?v=UfcAVejslrU&feature=youtu.be
13. Continue recording until the song is over. Click Stop.
14. Click on the Save button to save the data file.
15. 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 baseline values.
2. Use the Display Time icons to adjust the Display Time of the Main window to display the one minute recording of the subject's baseline SCL on the Main window. This section of data can also be selected by:
    - Placing the cursors on either side of one minute of baseline data recording of the subject's SCL, HR and BR.
    - Clicking the Zoom between Cursors button on the LabScribe toolbar to expand or contract the one minute recording to the width of the Main window.
3. On the right hand margin of the Skin Conductance, Heart Rate and Breathing Rate channels, the mathematical function, Mean, should appear. The value for mean baseline skin conductance level, mean heart and breathing rates are displayed on each of the corresponding channels.

WorX Sample

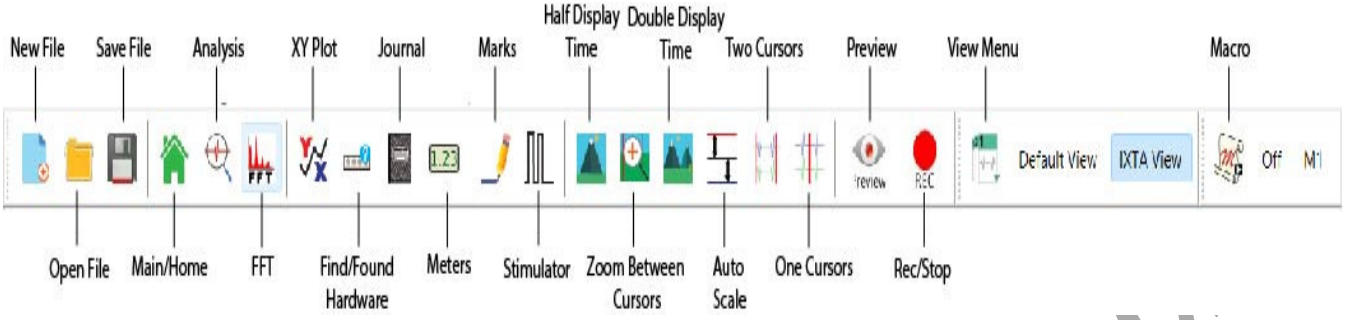

Figure HP-20-L2: The LabScribe toolbar.

4. These values can be recorded in the on-line notebook of LabScribe by typing the name and value of the parameter directly into the Journal.
5. Move the cursors to the section of data where the subject was listening to music. Position the cursors to have at least 1 minute of data on screen.
    - Note – you may want to look at different 1 minute periods of data while the subject was listening to determine if time has any affect on relaxation.
6. Repeat step 3 to record the mean skin conductance, HR and BR while listening to music.

Table HP-20-L1: Baseline SCL & Temperature vs. SCL & Temperature after Imagery

Name	Mean Baseline SCL (µS)	Mean Baseline HR (bpm)	Mean Baseline BR (bpm)	Relaxing Music SCL (µS)	Relaxing Music HR (bpm)	Relaxing Music BR (bpm)
1 minute						
1.5 minutes						
2 minutes						
2.5 minutes						
3 minutes						
3.5 minutes						

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