Experiment HP-3: The GSR, Deception, Cognitive Complexity, and Vigilance

Equipment Required

PC or Mac Computer

IXTA, USB cable, IXTA power supply

C-GSR-320 cable

GSR Setup

1. Locate GSR cable.

Figure HP-3-S1: The GSR galvanic skin response amplifier.

2. Plug the GSR cable into the GSR channel A7.
3. Attach the GSR electrodes to the pointer and ring finger of the subject's hand where the fingerprints are located. Make sure the fingers are not too cold or too dry.
    - Make sure to use the GSR Conductive paste, just enough to cover the electrodes.
    - Do not use alcohol on the subject's fingertips.

Note – the GSR unit is precalibrated. No other calibration is needed.

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4. Select a person from your group to be the subject. Select a person who was not the subject in Experiment HP-2.
5. Give the subject their own copy of the ten questions that will be asked in this exercise – see Table 1:
    - Ask the subject to select three questions from Questions 2 through 10. The subject should not tell other members of the group which questions were chosen.
    - When those three questions are asked, the subject will deliberately deceive the polygrapher(s).
    - In private, the subject should mark the three questions that they chose with a letter D for deception. The subject should place their marked copy of the questions in an envelope before the beginning of the exercise.
6. Have the subject wash their hands. Washing the hands insures that surface oils or other substances, which might lower skin conduction, are removed.
7. Make sure to use the GSR Conductive paste.
8. Connect the GSR electrodes. 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.
9. The subject should sit with their back to the computer monitor. Use the subject's hand which is closer to the iWorx equipment.
10. The subject should rest their hand with the GSR electrodes 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 will introduce artifacts into the recording.

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Experiment HP-3: The Galvanic Skin Response, Deception, Cognitive Complexity, and Vigilance

Reminder – this lab is a continuation of experiment HP-2: GSR-A

Exercise 4: GSR and Deliberate Deception

Aim: To test an experimental hypothesis about deliberate deception and the amplitude of the GSR.

Approximate Time: 20 minutes

Procedure

1. Select a person from your group to be the subject. Select a person who was not the subject in Experiment HP-2.
2. Give the subject their own copy of the ten questions that will be asked in this exercise – see Table 1:
    - Ask the subject to select three questions from Questions 2 through 10. The subject should not tell other members of the group which questions were chosen.
    - When those three questions are asked, the subject will deliberately deceive the polygrapher(s).
    - In private, the subject should mark the three questions that they chose with a letter D for deception. The subject should place their marked copy of the questions in an envelope before the beginning of the exercise.
3. The subject should sit with their back to the computer monitor. Use the subject's hand which is closer to the iWorx equipment.
4. The subject should rest their hand with the GSR electrodes 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 will introduce artifacts into the recording.
5. Type **Tonic SCL** <Subject's Name> in the Mark box.
6. Click on the Record button. Click the mark button. Record the subject's tonic SCL for one minute. Continue recording.
7. Type **Habituation** <Subject's Name> in the Mark box. Habituate the subject to the questioning paradigm:
    - Ask the subject a neutral question: Is your name, X? (X is the subject's real name).
    - Click the mark button. The subject should respond **Yes**.
    - Ask the question again only after the subject's skin conductance level has returned to a baseline level. Mark the recording each time the question is asked.
    - Continue to ask the subject the same question for five minutes. After the subject is habituated, click Stop to halt the recording.
8. Instruct the subject to sit quietly, and answer each question from the list in Table 1 with either a Yes or a No. The subject should not elaborate on any answer.

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9. Type **DDQ1** (for Deliberate Deception Question 1) in the Mark box. Click the mark button as the subject is asked the first question. Continue recording.
10. Before asking the next question:
    - Type the number of the next question, **DDQ2**, in the Mark box.
    - Wait for the subject's skin conductance level to return to the baseline level before asking the next question. Also, wait for any spontaneous skin responses to return to their baseline frequency before asking the next question.
11. Click the mark button to mark the recording as the subject is asked the next question. Continue recording.
12. Repeat Steps 9 and 10 for the remaining eight questions in the list, labeling each question as DDQX, where X is the number of the question.
13. When the subject's skin conductance response to the tenth question is completed, click Stop to halt the recording.
14. Select Save As in the File menu, type a name for the file. Click on the Save button to save the data file.

Table HP-3-L1: Questions for Deliberate Deception Task

1. Is your name, X? (X is the subject's real name.)
2. Do you have a part-time job?
3. Have you ever had a Spanish class?
4. Do you have a roommate?
5. Are you planning to go to graduate school?
6. Have you ever gone backpacking?
7. Do you like rainy days?
8. Have you ever worked as a camp counselor?
9. Do you study in the evenings?
10. Do you enjoy classical music?

Data Analysis

1. Scroll through the data file and locate the recording of the subject's skin conductance response to the first question in the list of deliberate deception questions.
2. Use the Display Time icons to adjust the Display Time of the Main window to display the complete response to the first question on the Main window. This section of data can also be selected by:
    - Placing the cursors on either side of the subject's skin conductance response to the first question, and
    - Clicking the Zoom between Cursors button on the LabScribe toolbar to expand or contract this section of the recording to the width of the Main window.

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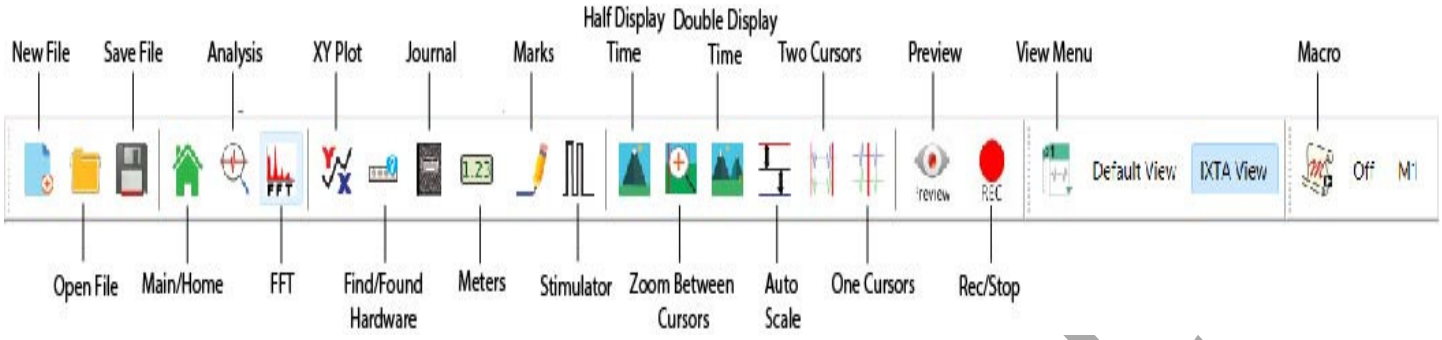

Figure HP-3-L1: The LabScribe toolbar.

3. Click on the Analysis window icon. Look at the Function Table that is above the Skin Conductance Level channel in the Analysis window. The functions, Value1, Value 2, V2-V1, and T2-T1, should appear in this table. The values for these functions are displayed in the table across the top margin of the Skin Conductance Level channel.
4. On the Skin Conductance Level channel, use the mouse to click on and drag a cursor to the point in the recording when the question was asked. Drag the other cursor to peak of the subject's response to the question. The following parameters of the subject's response are measured by the functions listed in the table:
    - **Baseline Skin Conductance Level,** which is the skin conductance level of the subject at the time the question was asked. The value for the Value1 function on the Skin Conductance Level channel is the baseline skin conductance level.
    - **Peak Response Skin Conductance Level**, which is the maximum skin conductance level of the subject in the period after the question was asked. The value for the Value2 function on the Skin Conductance Level channel is the skin conductance level of the peak response of the subject.
    - **Change (Δ) in Skin Conductance Level,** which is the difference between the baseline and maximum skin conductance levels of the subject in response to the question. The value for the V2-V1 function on the Skin Conductance Level channel is the change in the skin conductance level of the subject.
    - **Peak Response Rise Time**, which is the time between the question being asked and the peak response of the subject to the question. The value for the T2-T1 function on the Skin Conductance Level channel is the rise time of the peak response.
5. Once the cursors are placed in the correct positions for determining the skin conductance levels and rise time in the subject's response, the values for the parameters in the function table can be recorded in the on-line notebook of LabScribe by typing the names and values of the parameters directly into the Journal.
    - The functions in the right-click menu of the Analysis window can also be used to enter the names and values of the parameters from the recording to the Journal. To use these functions:

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- Place the cursors at the locations used to measure the skin conductance levels and rise time.
- Transfer the names of the parameters to the Journal using the Add Title to Journal function in the Skin Conductance Level channel menu.
- Transfer the values for the parameters to the Journal using the Add Ch. Data to Journal function in the Skin Conductance Level channel menu.

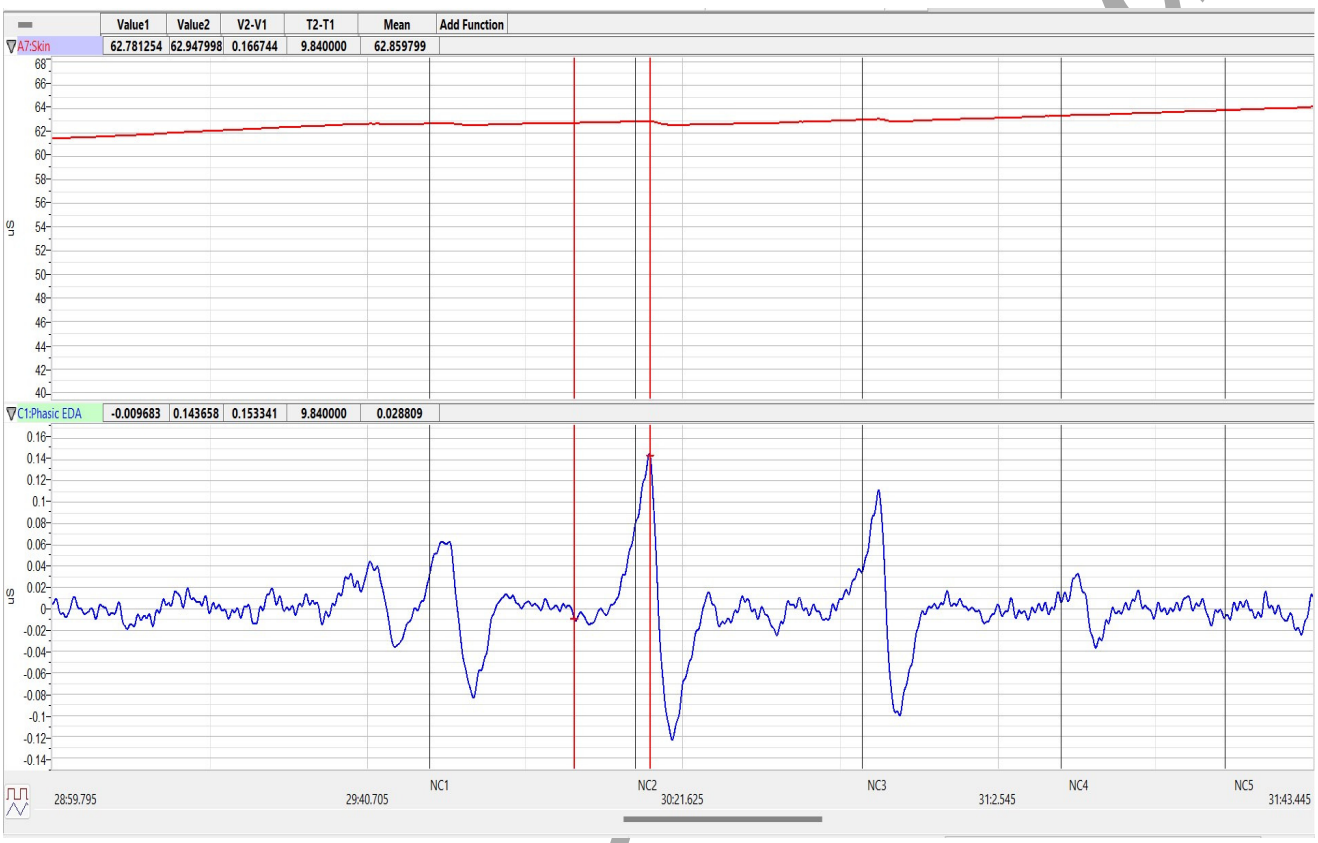

Figure HP-3-L2: Skin conductance level of a subject responding to a question displayed in the Analysis window. The cursors are in positions to measure the baseline SCL (V1), the peak SCL (V2), the change in SCL (V2-V1), and the rise time (T2-T1).

Note: *In this exercise, it would not be useful to calculate the latency, which is the time between the mark indicating the question and the onset of the response. The questions in this exercise are not brief discrete events; each question is a different length and takes a different time to ask. Latency will be measured in another exercise in another context.*

6. Record the values in the Journal using the one of the techniques described above.
7. Enter the values for the parameters for the subject's response to Question 1 in Table 2.
8. Repeat Steps 1 through 7 for the other nine deliberate deception questions in the list.

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9. Determine the mean change in SCL and the mean rise time of the peak response for the three deceptive questions. Also, determine the mean change in SCL and the mean rise time of the peak response for the seven honest questions. Enter these means in Table 2.
10. Compare the mean change in SCL and the mean rise time of the peak response for the deceptive questions to those of the honest questions. It is expected that the mean change in SCL is greater and the mean rise time is shorter for the deceptive questions than for the honest questions.

Table HP-3-L2:Comparison of Skin Conductance Changes for Honest and Deliberate Deception Questions.

Questions	Deceptive (D) or Honest (H)	Baseline SCL (µS)	Peak Response SCL (µS)	Δ in SCL (µS)	Peak Response Rise Time (seconds)
1.	H				
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
Means for 7 Honest Questions	H				
Means for 3 Deceptive Questions	D				

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Exercise 5: GSR and Guilty Knowledge

Aim: To test an experimental hypothesis about guilty knowledge and the amplitude of the GSR using The Guilty Knowledge Test.

Approximate Time: 45 minutes

There are many versions of The Guilty Knowledge Test. There are common factors in all versions of this test:

- *All versions use a polygraph*
- *The person being tested is knowledgeable about some fact;*
- *The person being tested is concealing or failing to disclose that knowledge, when asked.*

Procedure

1. Select two new subjects. During this exercise, each subject will silently read a different scenario about the same hypothetical crime.
2. Each scenario will be sealed in its own envelope labeled A or B. A third sealed envelope labeled Terms contains target terms.
3. Each lab group will receive a set of 3 envelopes. Give the envelope labeled A to one of the subjects, the envelope labeled B to the other subject, and the third envelope will be kept by the other students in the lab group.
4. Each subject should read the contents of their envelope in private, and not share the information in the click release with each other or the rest of the group. One envelope contains a click release that: describes the murder scene in detail; notes that the police have failed to identify the cause of death or the murder weapon; and, states that all the objects at the murder scene have been ruled out as the murder weapon (Table 4). The other envelope contains the same click release, with an additional release that identifies the cause of death and the murder weapon (Table 5).
5. Toss a coin to select the subject who goes first. Ask the other subject to leave the room until called.
6. Attach the GSR electrodes to the GSR amplifier and to the first subject.
7. Type **<Subject's Name> Tonic SCL** in the Mark box.
8. Click on the Record button. Click the mark button. The value displayed on the Skin Conductance Level channel is the tonic skin conductance level (SCL) of the subject. Record the subject's tonic SCL for one minute. Continue recording.
9. Type **Baseline** in the Mark box. Click the mark button.
10. Type **Habituation** in the Mark box. Habituate the subject to the questioning paradigm:
    - Ask the subject a neutral question: Is your name, X? (where X is the subject's real name). Click the mark button. The subject should respond Yes.
    - Ask the question again only after the subject's skin conductance level has returned to its baseline level. Mark the recording each time the question is asked.

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- Continue to ask the subject the same question for five minutes. After the subject is habituated, click Stop to halt the recording.

11. Instruct the subject to sit quietly, and **answer each question with a No**. The subject should not elaborate on any answer. The questions are asked in the format:

    Was the _____ a murder weapon?

Each time the question is asked, insert the name of a different possible weapon in the blank in the question. The ten possible murder weapons are listed in Table 3.

12. Type **S1Q1** (for Subject 1, Question 1) in the Mark box.
13. Click Record and click the mark button as the first question is asked. Continue recording.
14. Before asking the next question:
    - Type the number of the next question, **S1Q2**, in the Mark box.
    - Wait for the subject's skin conductance level to return to the baseline level before asking the next question. Also, wait for any spontaneous skin responses to return to their baseline frequency before asking the next question.
15. Click the mark button to mark the recording as the subject is asked the next question. Continue recording.
16. Repeat Steps 16 and 17 for the remaining eight questions in the list, labeling each question as S1QX, where X is the number of the question.
17. When the subject's skin conductance response to the tenth question is completed, click Stop to halt the recording.
18. Select Save in the File menu
19. Disconnect the first subject from the GSR electrode wires.
20. Ask the first subject to leave the room.
21. Ask the second subject to enter the room.
22. Repeat Steps 6 through 18 for the second subject ("S2").

Table HP-3-L3: Ten Possible Murder Weapons for the Scenarios presented in The Guilty Knowledge Test.

1. cushion	2. hand	3. bird	4. tea	5. brain
6. vase	7. gun	8. spider	9. lamp	10. knife

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Data Analysis

1. Scroll through the data file and locate the recording of the first subject's skin conductance response to the first question, S1Q1, in The Guilty Knowledge Test.
2. Use the same procedures used in Exercise 4 to position data in the Main window, display the selected data in the Analysis window, and measure values for the following parameters of the response to the first question:
    - **Baseline Skin Conductance Level**, which is the skin conductance level of the subject at the time the question was asked. The value for the Value1 function on the Skin Conductance Level channel is the baseline skin conductance level.
    - **Peak Response Skin Conductance Level**, which is the maximum skin conductance level of the subject in the period after the question was asked. The value for the Value2 function on the Skin Conductance Level channel is the skin conductance level of the peak response of the subject.
    - **Change (Δ) in Skin Conductance Level,** which is the difference between the baseline and maximum skin conductance levels of the subject in response to the question. The value for the V2-V1 function on the Skin Conductance Level channel is the change in the skin conductance level of the subject.
    - **Peak Response Rise Time**, which is the time between the question being asked and the peak response of the subject to the question. The value for the T2-T1 function on the Skin Conductance Level channel is the rise time of the peak response.
    - Record the values for these functions in the Journal using the one of the techniques described in Exercise 4.
3. Enter the values for the baseline skin conductance level, peak response SCL, change in SCL, and rise time of the peak response for the first question in Table HP-3-L6.
4. Repeat Steps 1 through 4 for the other nine questions asked of the first subject
5. Repeat Steps 1 through 5 for the second subject

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Table HP-3-L4: The Murder Scenario Read by the Naive Subject.

Mr. Richards arrived at the law firm of Richards and Adams one morning to find Mr. Adams dead on the floor. There was some blood on his head as a sign of a possible head injury. A table was tipped over spilling a tea cup and its contents on the floor and a lamp and vase from the table were broken and on the floor by the table. A cushion from the couch had been pulled to the floor by Mr. Adams' hand as he fell. Mr. Adams' gun was still in its locked drawer untouched as was his pen knife (which he often used as a letter opener) on his desk. The file cabinet top drawer was open and the contents of several folders were scattered on the floor. Interestingly, his pet parakeet was flying wildly around the room and its cage door was ajar and must have been for a long time as a spider had constructed a web to catch flies across the opening.

The police have not been able to determine the murder weapon or the cause of death as yet. An autopsy is pending. The head injury was slight and probably due to the fall. It was not likely to have resulted in death. The police are baffled over the cause of Mr. Adams' death and the exact murder weapon.

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Table HP-3-L5: The Murder Scenario Read by the Knowledgeable Subject.

Mr. Richards arrived at the law firm of Richards and Adams one morning to find Mr. Adams dead on the floor. There was some blood on his head as a sign of a possible head injury. A table was tipped over spilling a tea cup and its contents on the floor and a lamp and vase from the table were broken and on the floor by the table. A cushion from the couch had been pulled to the floor by Mr. Adams' hand as he fell. Mr. Adams' gun was still in its locked drawer untouched as was his pen knife (which he often used as a letter opener) on his desk. The file cabinet top drawer was open and the contents of several folders were scattered on the floor. Interestingly, his pet parakeet was flying wildly around the room and its cage door was ajar and must have been for a long time as a spider had constructed a web to catch flies across the opening.

The police have not been able to determine the murder weapon or the cause of death as yet. An autopsy is pending. The head injury was slight and probably due to the fall. It was not likely to have resulted in death. The police are baffled over the cause of Mr. Adams' death and the exact murder weapon.

Unknown to everyone but Mr. Adams' psychiatrist is the fact that Mr. Adams was arachnophobic and had an intense and unreasonable fear of spiders. Mr. Adams was working late the night of the accident and needed a particular file from the cabinet. As he opened the file a large spider crawled from the file cabinet onto his arm. Mr. Adams's sudden and overwhelming panic attack caused by his fear of spiders sent a flood of brain signals from the medulla to the heart via the sympathetic nervous system, literally stopping his heart. Mr. Adams experienced "sudden adult death syndrome" from his excessive brain response to the spider.

As he fell to the floor dropping the files, the table overturned spilling the tea cup and its contents on the floor. He hit his head on the table and grabbed the couch cushion with his hand as he fell. The lamp and vase also fell to the floor and broke. The bird was out of its cage because Mr. Adams often let the bird fly free when he was in the office alone at night, although he never let Mr. Richards know of this.

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Table HP-3-L6: Comparison of Skin Conductance Changes for Subjects that are Naive or have Knowledge of Guilt.

N=Naive K=Knowledge	S1: N or K S2: N or K	Baseline SCL (µS)		Peak Response SCL (µS)		Δ in SCL (µS)		Peak Response Rise Time (seconds)	
Terms	Target (T) or Not (N)	S1	S2	S1	S2	S1	S2	S1	S2
1. cushion									
2. hand									
3. bird									
4. tea									
5. brain									
6. vase									
7. gun									
8. spider									
9. lamp									
10. knife.									
Means for T	T								
Means for N	N								

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Hypotheses for The G-K Test

Hypothesis 1: The mean skin responses of the knowledgeable subject to the two target terms (possible weapons) will be greater than that subject's responses to the non-target terms.

Hypothesis 2: The mean skin responses of the naive subject to the two target terms (possible weapons) will be no greater than that subject's responses to the non-target terms.

1. Open the third envelope and find out which terms are the target terms. Label the two target terms in Table 6.
2. All members of the lab group can now read the click releases read by Subjects 1 and 2. Identify the naive (N) and the knowledgeable (K) on the table.
3. Determine the mean change in SCL and the mean rise time of the peak response for the target and non-target questions for both subjects. Enter these means on.

4. Is the mean change in SCL greater and the mean rise time of the peak response shorter for the target terms than for the non-target terms in the knowledgeable subject?
5. Is there any significant difference between the mean change in SCL and the mean rise time of the peak response for the target terms and those values for the non-target terms in the naive subject?
6. Which of the two hypotheses does your data support?

Exercise 6: Cognitive and Emotional Complexity

Aim: To demonstrate how cognitive and emotional complexity of a task influences the latency of skin responses.

Approximate Time: 30 minutes

Sometimes, words, phrases, and even gestures evoke multiple associations in memory because of a person's unique history or life experiences

For example, the letters "id" for one person may be associated with an identification number, such as a PIN or a social security number. For a second person, it may bring an association with Freudian terminology for the personality, the Id. For a third person, it may evoke associations of personal tattoos in the Nazi concentration camps, or the "dog tags" worn by soldiers.

Procedure

1. Select a **new** subject for this exercise. Ideally, it should be a person who has **not** read the lab exercise and is naive to the purpose of the exercise.
2. Attach the GSR electrodes to the GSR amplifier and to the subject.
3. The task in this exercise involves word associations:
    - There should be no noise in the room during this experiment. No one should make comments while observing the experiment. Laughter, whispering, and other extraneous comments can influence the subject's skin conductance dramatically.
    - A prompt word will be spoken to the subject. The words on the list (Table 7) should be spoken in sequence.
    - Select a person in your lab group to type the word in the Mark box on the recording window. Select second person to speak the word at the same time they press the mark button to mark the recording.
    - The subject will respond by saying aloud the first word which comes to their mind. The verbal response does not need to be recorded in the Journal, but you may want to write down the response for your records.
    - Only the subject's skin conductance responses to the prompt words need to be recorded.

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Table HP-3-L7: Word List for Cognitive and Emotional Complexity Task.

1. pencil
2. book
3. car
4. joint
5. house
6. coke
7. table
8. cup
9. crank
10. tree

4. Type **<Subject's Name> Tonic SCL** in the Mark box.
5. Click on the Record button. Click the mark button. The value displayed on the Skin Conductance Level channel is the tonic skin conductance level (SCL) of the subject. Record the subject's tonic SCL for one minute. Continue recording.
6. Type **Baseline** in the Mark box. Click the mark button. Record for the subject's baseline SCL for two minutes. Click Stop to halt the recording.
7. Instruct the subject to sit quietly. Habituate the subject to the questioning paradigm by asking neutral questions for five minutes. You do not need to record this habituation task.
8. Once the habituation is completed, begin the association task. Type the word **Pencil** in the Mark box. Click Record. Wait 30 seconds before speaking. Click the mark button as the word Pencil is spoken. Continue recording.
9. Before speaking the next word:
    - Type the word, **Book**, in the Mark box.
    - Wait for the subject's skin conductance level to return to the baseline level before speaking the next word.
    - Wait for any spontaneous skin responses to return to their baseline frequency before speaking the next word.
10. Click the mark button to mark the recording as the next word is spoken. Continue recording.
11. Repeat Steps 11 and 12 for the remaining eight words in the list, labeling the beginning of each trial with a mark containing the word.
12. When the subject's skin conductance response to the tenth word is completed, click Stop to halt the recording.
13. Select Save As in the File menu, type a name for the file. Click on the Save button to save the data file.

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Data Analysis

1. Scroll through the data file and locate the recording of the subject's skin conductance response to the first word in the list.
2. Use the same procedures used in Exercises 4 and 5 to position data in the Main window, display the selected data in the Analysis window, and measure values for the following parameters of the response to the first question:
    - **Baseline Skin Conductance Level**, which is the skin conductance level of the subject at the time the prompt word was given. The value for the Value1 function on the Skin Conductance Level channel is the baseline skin conductance level.
    - **Peak Response Skin Conductance Level**, which is the maximum skin conductance level of the subject in the period after the prompt word was given. The value for the Value2 function on the Skin Conductance Level channel is the skin conductance level of the peak response of the subject.
    - **Change (Δ) in Skin Conductance Level**, which is the difference between the baseline and maximum skin conductance levels of the subject in response to the prompt word. The value for the V2-V1 function on the Skin Conductance Level channel is the change in the skin conductance level of the subject.
    - **Peak Response Rise Time**, which is the time between the prompt word being given and the peak response of the subject to the word. The value for the T2-T1 function on the Skin Conductance Level channel is the rise time of the peak response.
3. Record the values for these functions in the Journal using the one of the techniques described in Exercise 4.
4. Enter the values for the baseline skin conductance level, peak response SCL, change in SCL, and rise time of the peak response for the first prompt word in Table 8.
5. On the Analysis window, keep one cursor at the time that the prompt word was spoken. Move the other cursor from the peak of the subject's skin conductance response to the onset of that response. The value for T2-T1 for the cursors in these positions is the latency of the subject's response to the spoken word.
6. Record the value for the latency of the response to this prompt word in the Journal using the one of the techniques described in Exercise 4. Also, enter this value in Table 8
7. Repeat Steps 1 through 6 for the subject's skin responses to the other nine prompt words.
8. Determine the mean change in SCL, mean rise time of the peak response, and mean latency of the three target words, and of the seven neutral words. Enter these means on Table 8.

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Table HP-3-L8: Comparison of Skin Conductance Changes for Words spoken in the Cognitive and Emotional Complexity Task.

Words	Target (T) or Neutral (N)	Beginning SCL (µS)	Maximum SCL (µS)	Δ in SCL (µS)	Latency (seconds)	Rise Time (seconds)
1. Pencil	N					
2. Book	N					
3. Car	N					
4. Joint	T					
5. House	N					
6. Coke	T					
7. Table	N					
8. Cup	N					
9. Crank	T					
10. Tree	N					
Means - Neutral Words	N					
Means - Target Words	T					

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Hypothesis

Hypothesis: The mean latency of the responses to the three target words is greater than the mean latency of the seven neutral words.

The assumption is that most persons have had some exposure to drug-related terms via public media, education, or personal experience, and this experience will enable multiple associations to these terms when they are heard. Some of these multiple associations may or may not be emotional in nature. Words with multiple associations without emotional significance may also cause GSR responses with longer latencies.

1. Compare the mean latency for the target words to that for the neutral words.
2. Does your data support the hypothesis?
3. How do the mean change in SCL and the mean rise time of the peak response for the target words compare to the same parameters for the neutral words?

Exercise 7: Personality, Vigilance, and the Lability of SCL

Aim: To test the hypothesis that persons with greater lability in skin conductance have greater vigilance decrements and are less vigilant than persons with less lability in skin conductance. Researchers have identified a link between the trait of skin conductance lability and that of vigilance (Shell, et al., 1988).

Approximate Time: 30 minutes

All subjects who participated in Exercise 1 of Experiment HP-2: The Galvanic Skin Response (GSR) and Emotion should take the following Vigilance Test.

Procedure

1. To test the relationship between the vigilance of a subject and the lability of the subject's skin conductance response, each subject performs a ten-minute vigilance test with the following components:
    - When told to begin, the subject scans a printed page and highlights, with a marker, all the occurrences of consecutive vowels.
    - At the end of five minutes, the subject is told to stop scanning and highlighting, and to draw a line on the page to mark their progress.
    - In the remaining five minutes of the test period, the subject scans and highlights consecutive vowels on the second page of the test.
    - At the end of the second five minute period of the test, the subject is told to stop scanning and highlighting, and to draw a line on the page to mark their progress.
    - Score the test for the following parameters:

        -The percent correct for the total possible chances in the completed tests;

        -The percent correct for the total possible chances on first page;

        -The percent correct for the total possible chances on the second page.
2. Calculate the subject's vigilance decrement score by subtracting the percent correct for the first page from the percent correct for the second page. A positive vigilance decrement score indicates an improvement in performance, rather than a decrement.
3. The remainder of this exercise is completed using data recorded when the subjects performed Exercise 1 of Experiment HP-2: The Galvanic Skin Response (GSR) and Emotion and reported on the class data sheet. Make sure you obtain a copy of the class data sheet containing the information needed to complete this exercise.
4. The information compiled on a class data sheet includes:
    - The number of spontaneous skin responses per minute for each member of the class tested in Exercise 1 of Experiment HP-2: The Galvanic Skin Response (GSR) and Emotion. This parameter is considered to be one of the independent variables in the exercise.
    - The habituation score for each member of the class tested in Exercise 1 of Experiment HP-2: The Galvanic Skin Response (GSR) and Emotion. This parameter is also an independent variable.

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- The vigilance and decrement scores for each member of the class who participated in Exercise 1 of Experiment HP-2: The Galvanic Skin Response (GSR) and Emotion. The vigilance and decrement scores are the dependent variables in this analysis.

5. Divide the subjects in the class into two groups based on the number of spontaneous skin conductance responses per minute. Use a median split to place the subjects with the number of spontaneous skin conductance per minute that is below the median in the low lability group; subjects with a number of spontaneous skin conductance per minute that is above the median in the high lability group.
6. Also, divide the subjects in the class into two groups based on habituation scores. Use a median split to place the subjects with the number of trials before habituation that is below the median in the low lability group; subjects with the number of trials before habituation above the median in the high lability group.
7. Calculate the mean vigilance and decrement scores for the four lability groups and enter the values in Table 9.

Hypothesis

Hypothesis: Persons with greater lability in skin conductance (high spontaneous response frequency, high habituation score) have greater vigilance decrements and are less vigilant than persons with less lability in skin conductance.

1. Compare the mean vigilance (mean percent correct in the complete test) and vigilance decrement (or improvement) scores for the high spontaneous response group to those of the low spontaneous group.
2. Compare the mean vigilance (mean percent correct in the complete test) and vigilance decrement (or improvement) scores for the high habituation score group to those of the low habituation score group.
3. Do these comparisons support the hypothesis?

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Table HP-3-L9: Mean Vigilance Scores for High and Low Lability Groups

	Spontaneous Response/Minute		Habituation Score	
Vigilance and Decrement Scores	Low Number (Low Lability)	High Number (High Lability)	Low Number (Low Lability)	High Number (High Lability)
Mean Percent Correct of Total Possible Chances in the Complete Test				
Mean Percent Correct from Total Possible Chances on the First Page of the Test				
Mean Percent Correct from Total Possible Chances on the Second Page of the Test				
Mean Improvement (+)/Decrement (-) Score Mean % Correct (Page 2) - Mean % Correct (Page 1)				

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References

Edelberg, R. (1972). Electrical Activity of the Skin: Its Measurement and Uses in Psychophysiology. In N. S. Greenfield & R. A. Sternbach (Eds.), Handbook of psychophysiology, 367-418. New York: Holt.

Schell, A. M., Dawson, M. E., & Filion, D. L. (1988). Psychophysiological Correlates of Electrodermal Lability. Psychophysiology, 25, 619-632.