

PhysioPilot C2 Plus

STRESS PROFILE APPLICATIONS

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INSTALLATION OF ADOBE FLASHPLAYER

ADOBE FLASH IS REQUIRED. Download and install it from:

www.adobe.com/products/flashplayer/

This is critical: To show pictures and Stroop challenges, you must install Adobe Flash from the Web [adobe.com]. You must also instruct your firewall to accept it.

Sorry, J&J can not provide this download for you.

IMPORTANT INFORMATION:

PhysioPilot's collection of Stress Profiles has grown over the years. In 2010 we added another profile, the NeuroStress Profile. Several versions of the NeuroStress Profile were built by adding EEGs to existing Stress Profiles. These are still available. However we discovered that only a few neurofeedback researchers could untangle the various bands under stress and recovery. This was not practical.

Another important issue was where to place 4 EEG electrodes. The answer came as we worked on another application, the Quick Q. In late 2009 we added Dr. Swingle's Quick Q-GG to our arsenal. We added Temperature, Skin Conductance and Respiration to his Quick Q, greatly expanding its utility. At the same time, we saw that our NeuroStress Profile could be done with his existing

EEG sites. The electrodes were already in place, so it would be easy to finish both the Quick-Q and the NeuroStress Profile in a single 45 minute session. The result is a special application, [4a4].

4a4 Quick Q and NeuroStress Profile PRO: This application has both the Quick Q, an the PRO version of the NeuroStress Profile.

In order to make use of either program, the saved data needs to be exported to another program, currently Excel.

The Excel program is still in development in 2011.

We will have more on this Excel program in subsequent updates.

Until then, the [4a4] program is experimental only, available to researchers.

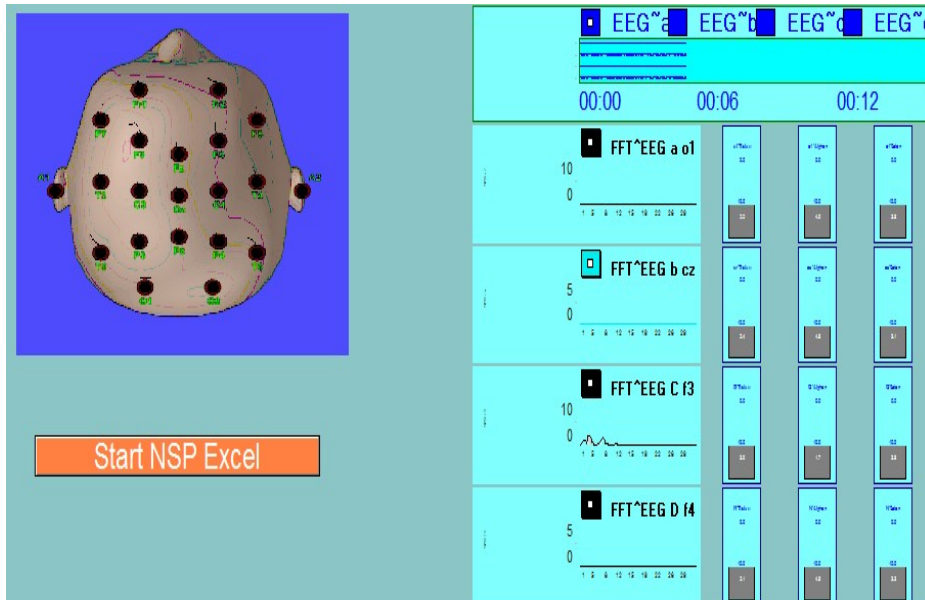
We recommend using the Stress Profiles for now.

Select 'Full PSP Exam'.

The NeuroStress Profile

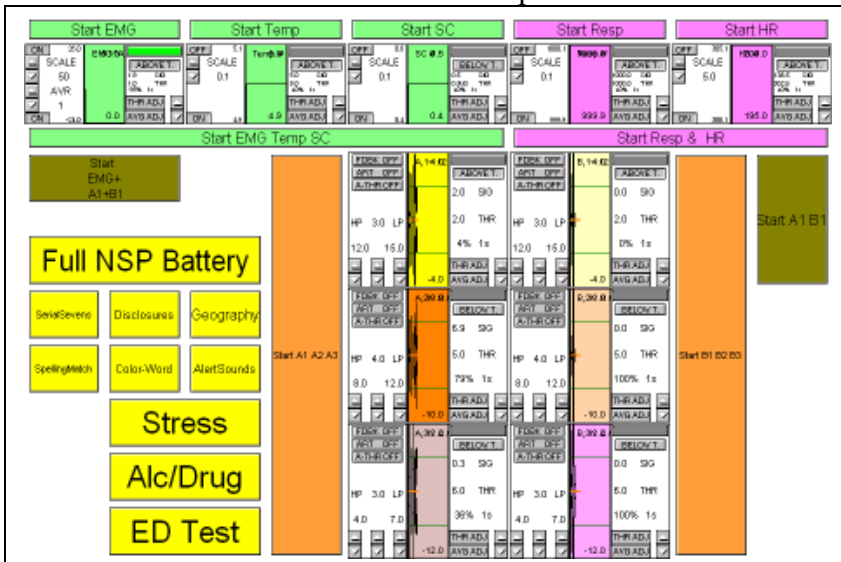
These require a C2 Plus 12 channel:

- [4a0] *NeuroStress Profile*



Select 'Start NSP Excel' for the Quick Q application.

You will also find a similar NeuroStress profile here:



Select 'Full NSP Battery' for the combo [6a4] applications.

OTHER MINI_PROFILES ARE INCLUDED:

Stress, Alcohol/Drug, and Eating Disorders Test are special tests about 10 minutes long. They are experimental, a guideline for further research. DO NOT USE CLINICALLY. TAKE A WORKSHOP ON HOW TO USE THEM.

WHAT IS A STRESS PROFILE?

Stress profiles give you a snapshot of a client's reactivity and recovery to common and individuated physical and emotional stressors.

WHAT IS A NEUROSTRESS PROFILE?

The NeuroStress Profile adds EEG to peripheral signal analysis.

DISCLAIMER:

This program is sold as is. No medical claims are made about the Stress Profile and the NeuroStress Profile. It remains valuable because it provide hints as to how this person responds to stressors.

SUGGESTED USE:

Begin each client with a stress profile and you can individualize interventions based in part on their stress profile.

INSTRUCTIONS:

The Stress Profile is self-explanatory. All instructions and tasks are spoken as well as written. Your job is to participate by answering questions, rating their subjective distress, and guiding them to answer. For example you need to focus them on the color

selections in Stroop, prompting them to disclose weaknesses, and breathing rapidly and deeply with them. Finally, you must record the SUDS ratings after each stressor.

How to Conduct a Stress Profile:

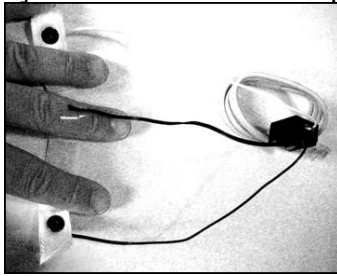
Explain the Purpose: This is already done for you. Bring up the first screen and it will give a speech about the how the profile takes a snapshot of your stress and recovery patterns, like a Halter monitor tread mill test, and helps plan stress management biofeedback.

Connect Sensors.

For [2a2] connect EMG, Temp and SC on Input A.

For [3b2] connect ECG and Resp on Input B.

For [3d2] combine sensors for Inputs A & B.

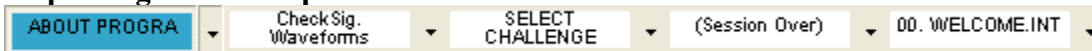


For the NeuroStress Profile, add EEGs to Inputs C & D.

For the C2Plus 6 versions, use only one EEG, placed on F3.

For the Quick Q add EEGs to all inputs, A, B, C and D.

Step through the Set Up Screen Tabs:



Check Signal Waveforms:

Observe that all signals are reactive.

Select Challenge:

The Stress profiles are found on the SELECT PROTOCOL tab. The screens vary. Within the screen are colored buttons. Press the labeled buttons to active a program. To active a stress profile press one of the PSP or NSP buttons.

WHAT KIND OF TASKS ARE USED?

'Relaxation is included as a 'task'. This provides a baseline. The Stress Profile consists of Relaxation, Stroop, Serial Sevens, Self-disclosure, and Over-breathing.

S.U.D.S: Subjective Units of Distress Scale:

How accurately does your client judge their level of distress? The client is asked

to rank their distress on a scale from 1 to 10. This is done at the beginning, after each Challenge, and at the end.

TIMING:

Instructions take between 20 seconds and a minute. The stressors take 60 seconds. Recovery is 120 seconds. SUDS ratings take about 30 seconds. So each Challenge takes about 4 minutes, and there are five Challenges, for a total time of about 20 minutes.

These times can be changed on a one-time basis by pressing the Task Time Button:



Task time is temporarily changed for that segment, but not for the rest of the profile.

ENDING THE PROFILE:

The profile ends automatically. At that point you must save the data and exit to the USE3 Menu.

Finished? Press diagonal Arrow on the lower left **SAVE AND EXIT**.

DATA MANAGEMENT:

Select **Data Management**. On The **View Data Screen**, select client name the Stress Profile. Highlight the date and click **View**.

WAIT: The data is re-calculated [it may take a few minutes].

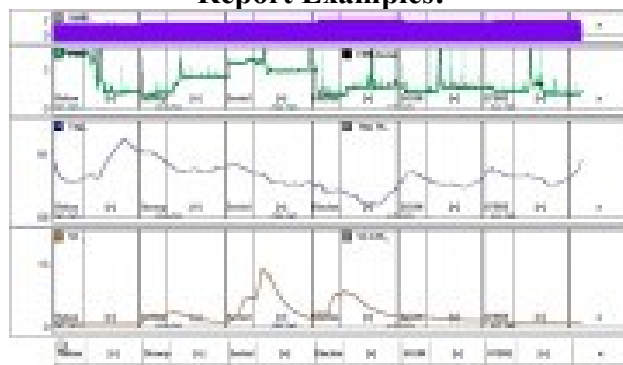
Eventually a new screen appears.

If the screen is blank, click anywhere, and a graph appears.

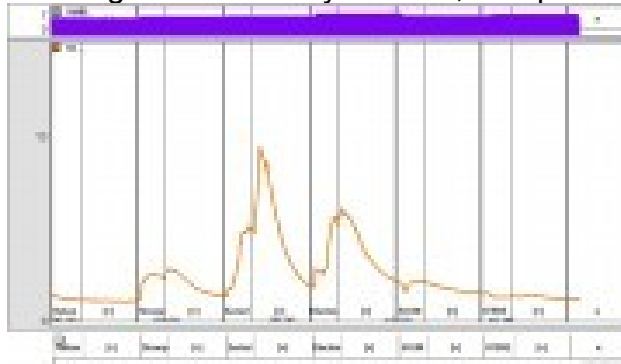
Use the Signal Control buttons to fine tune a display screen. Then Print using one of the three print options: save as picture [.bmp], print screen, or print to the Report Generator. That's all.

Interpretation is up to you. Generally Recovery is more important than arousal. Which signals showed best recovery? Which were worst? Which Challenges showed continued arousal during the Recovery periods? How well did the subjective estimate of distress mirror the overall ups and downs of the stress signals?

Report Examples:



Reports show SUDS ratings and reactivity of EMG, Temp and SC.



You can break down the profile by signal – SC is shown here.



Here is Temp.

FINAL COMMENT: Stress profiles provide a snapshot of individual reactivity. With practice, they help you judge the degree of difficulty a client will have in awareness of physiological arousal related to subjective feelings of distress.

The following is provided to help use the stress profile:

Psychophysiological Stress Assessment Using Biofeedback

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In the last half century, research in biofeedback has shown the extent to which the human mind can influence the functioning of the autonomic nervous system, previously thought to be outside of conscious control. By letting people observe signals from their own bodies, biofeedback enables them to develop greater awareness of their physiological and psychological reactions, such as stress, and to learn to modify these reactions. Biofeedback practitioners can facilitate this process by assessing people's reactions to mildly stressful events and formulating a biofeedback-based treatment plan. During stress assessment the practitioner first records a baseline for physiological readings, and then presents the client with several mild stressors, such as a cognitive, physical and emotional stressor. Variety of stressors is presented in order to determine a person's stimulus-response specificity, or differences in each person's reaction to qualitatively different stimuli. This video will demonstrate the process of psychophysiological stress assessment using

biofeedback and present general guidelines for treatment planning.

Part 1: Setting up and preparing the skin

1. Set up the following sensors: breathing belt, EMG, ECG, skin conductance, temperature, ground;
2. Prepare the skin by gently rubbing with an alcohol wipe in the following locations: forehead above the eyes for EMG, inside of both wrists for ECG, back of left hand for the ground (location of ground electrode may vary depending on equipment used);
3. Attach sensors to the skin in the following locations: breathing belt around the waist, EMG on the forehead above each eye, ECG on the inside of each wrist, skin conductance on middle finger of left hand, thermometer on the pointer of left hand, ground on the back of left hand;
4. Select session for Breathing+HRV;
5. Make sure that impedance is acceptable for all sensors and that the sensors are responsive to client's movement and producing reasonable readings.

Part 2: Recording

1. Explain the procedure to the client.
 2. (min 0-2) Instruct the client to sit quietly with eyes open. Record a two-minute baseline.
 3. (min 2-4) At the end of two minutes, begin a two-minute cognitive stressor – arithmetic problems gradually increasing in difficulty to be solved without use of pen & paper or calculator (if arithmetic is particularly difficult for the client, ask them to repeatedly subtract seven starting from 100, i.e., “serial sevens”). Give the following instructions to the client: “In the next 2 minutes, I will be asking you to solve some math problems. Please work as quickly as you can and tell me the answer”. Do not provide feedback as to whether the client's answer is correct or incorrect and provide minimal encouragement (eg., “just do the best you can”) so as not to eliminate the mild stress inducing properties of this exercise.
 4. (min 4-6) Let the client know that this part of the assessment is over and ask him/her to sit quietly with eyes open for 2 minutes.
 5. (min 6-8) Begin physical stressor: turn on loud noxious noise (babies crying, car crashes, etc.) and ask the client to listen to the sounds without tuning out.
 6. (min 8-10) Turn off noise, and ask the client to sit quietly with eyes open for 2 minutes.
 7. (min 10-12) Begin emotional stressor: ask the client to talk about a stressful incident that they remember well, include the details of the event, what they were thinking and feeling. Provide minimal empathic response so as not to mitigate the stress response.
 8. (min 12-14) Interrupt the client's story, even if he/she has not finished, and instruct the client to sit quietly with eyes open.
9. Stop recording, save the data, and let the client know that the assessment is done.

Part 3: Debriefing and treatment planning

1. Ask the client about their experience during the assessment.
Which parts were particularly stressful and why?
Did he/she feel any physiological changes happening?
2. Review data according to the criteria described in appendix I.
3. Chose physiological parameters that need to be addressed based on above analysis.
If sensor reading at baseline is higher or lower than normal, the treatment goal is to help the client bring that physiological parameter to normal in a non-stressful environment.
If sensor reading during the stressor is higher or lower than normal, the treatment goal is to help the client identify stressors and be able to maintain normal level of physiological functioning under stress.
If sensor reading during down time indicates lack of recovery, the treatment goal is to help the client bring that physiological parameter to normal level quickly following a stressor.
Any or all of these goals may be included in the treatment plan.

Appendix I

Stress assessment interpretation guidelines

(all "bold" answers indicate areas to be addressed)

EMG (normal reading <3 microvolts)

1. Is EMG elevated at baseline? **yes** _ no _
2. Is EMG elevated past the baseline at any of the 3 stressors? **yes** _ no _
3. Is there recovery of EMG to baseline level during rest periods? **yes** _ **no** _

Heart rate (normal range 60-80 beats per minute)

1. Is heart rate elevated at baseline? **yes** _ no _
2. Is heart rate elevated past the baseline at any of the 3 stressors? **yes** _ no _
3. Is there recovery of heart rate to baseline level during rest periods? **yes** _ **no** _

Breathing rate (normal rate <12 breaths per minute)

1. Is breathing rate elevated at baseline? **yes** _ no _
2. Is breathing rate elevated past the baseline for any stressor? **yes** _ no _
3. Is there recovery of breathing rate to baseline during rest periods? **yes** _ **no** _

Skin conductance

1. Is skin conductance elevated at baseline? **yes** _ no _
2. Is skin conductance elevated past the baseline for any stressor? **yes** _ no _
3. Is there recovery of skin conductance to baseline during rest periods? **yes** _ **no** _

Finger temperature (normal reading >90F)

1. Is finger temperature low at baseline? **yes** _ no _
2. Does finger temperature decrease past the baseline for any stressor? **yes** _ no _
3. Is there recovery of finger temperature to baseline during rest periods? **yes** _ **no** _

Heart rate variability (norms vary by age)

1. Is heart rate variability low at baseline? **yes** _ no _
2. Does heart rate variability decrease past the baseline for any stressor? **yes** _ no _
3. Is there recovery of heart rate variability during rest periods? **yes** _ **no** _

Appendix I

Stress assessment interpretation:

EMG (normal reading <3 microvolts)

1. Is EMG elevated at baseline? **yes** _ no _
2. Is EMG elevated past the baseline at any of the 3 stressors? **yes** _ no _
3. Is there recovery of EMG to baseline level during rest periods? **yes** _ no _

Heart rate (normal range 60-80 beats per minute)

1. Is heart rate elevated at baseline? **yes** _ no _
2. Is heart rate elevated past the baseline at any of the 3 stressors? **yes** _ no _
3. Is there recovery of heart rate to baseline level during rest periods? **yes** _ no _

Breathing rate (normal rate <12 breaths per minute)

1. Is breathing rate elevated at baseline? **yes** _ no _
2. Is breathing rate elevated past the baseline for any stressor? **yes** _ no _
3. Is there recovery of breathing rate to baseline during rest periods? **yes** _ no _

Skin conductance (normal reading <5 micro ohms)

1. Is skin conductance elevated at baseline? **yes** _ no _
2. Is skin conductance elevated past the baseline for any stressor? **yes** _ no _
3. Is there recovery of skin conductance to baseline during rest periods? **yes** _ no _

Finger temperature (normal reading >90F)

1. Is finger temperature low at baseline? **yes** _ no _
2. Does finger temperature decrease past the baseline for any stressor? **yes** _ no _
3. Is there recovery of finger temperature to baseline during rest periods? **yes** _ no _

Heart rate variability (norms vary by age)

1. Is heart rate variability low at baseline? **yes** _ no _
2. Does heart rate variability decrease past the baseline for any stressor? **yes** _ no _
3. Is there recovery of heart rate variability during rest periods? **yes** _ no _

Treatment planning:

If a reading is higher or lower than normal at baseline, goal of treatment is to help client bring that physiological parameter to normal in all circumstances

If a reading is higher or lower than normal during the stressor, goal of treatment is to help client identify stressors and be able to maintain normal level of

physiological functioning under stress

If a reading indicates lack of recovery during down time, goal of treatment is to help client bring that physiological parameter to normal level quickly following a stressor.

Completed psychophysiological in the appendi stress assessment provides a biofeedback practitioner with information necessary for formulating a treatment plan. This assessment provides information about both the individual's response stereotypy, or uniformity of certain physiological responses to all stressors, and stimulus-response specificity, or individual's unique physiological responses to different kinds of stressors. With this information, the client is then able to learn to predict what kind of physiological response to expect in which situation and be able to modify his/her response accordingly.

Following the assessment, it is important for the practitioner to inquire about the client's subjective experience of the stressors in order to catch any mismatch between client's subjective experience and physiological readings. Such mismatch would then need to be addressed during treatment.

It is also important to keep in mind that effects of the stressor presented first may impact client's response to subsequent stressors. One possible solution to this problem is to present stressors to the same client in different order on several occasions. However, this is time consuming and may not be feasible in a clinical, non-research, setting.

The protocol presented here is a general guideline, with many possible modifications depending on each client's individual needs and on the equipment available to the practitioner. Placement of EMG sensors may vary depending on the presenting problem (eg., masseter and/or sternocleidomastoid muscle for TMJD, upper trapezius and/or frontalis muscle for tension headaches). Particular stressors presented may vary according to what the client is likely to encounter in real life. With different equipment used, particular settings/programs used would vary accordingly.

Biofeedback practitioners should use their training to tailor the treatment to each individual client, with appropriate use of complementary psychotherapy to facilitate biofeedback treatment.

Material Name	Type	Company	Catalogue Number	Comment
Physiolab I-330-C2		J&J		
PLUS 12 ch				

1. Arena, J. and Schwartz, M. S. Psychophysiological assessment and biofeedback baselines. In Schwartz, M. S. and Andrasik, M (Eds.) Biofeedback: A Practitioners Guide, 3rd edition. The Guilford Press, 128-158 (2005).

2. Schwartz, N. M. and Schwartz, M. S. Definitons of biofeedback and applied psychophysiology. In Schwartz M. S. and Andrasik, M (Eds.) Biofeedback: A Practitioners Guide, 3rd edition. The Guilford Press, 27-42 (2005).

Khazan, I., Psychophysiological Stress Assessment Using Biofeedback <http://www.jove.com/details.stp?id=1443> doi: 10.3791/1443. J Vis Exp. 29 (2009).