Biofeedback Resources International

Biofeedback Matters

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Special points of interest:

- **Book Goes International**
- **Dealing With Artifacts in Bio and Neurofeedback**
- **Traumatic Brain Injury**
- **Local Biofeedback Conferences**

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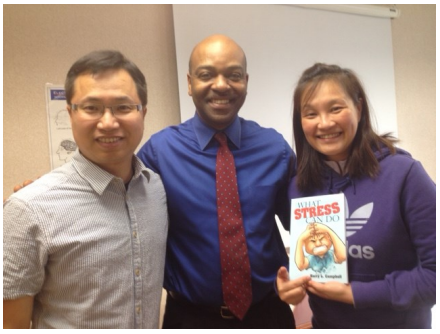
What Stress Can Do Is Going International

If you have called our Biofeedback Resources International office you may have talked to our team member Ethlin Smith. She went on a trip in March and brought several copies of my book "What Stress Can Do" with her. I gave her a task to give the copies away for free to someone in each country she visited. Thanks to Ethlin "What Stress Can Do" has made it to Paris, France, Venice, Italy, and Marbella, Spain.

Here are some pictures from her mission to spread the word about stress and stress management.

I also had the pleasant surprise of a couple who had trained with me in 2013 for biofeedback, return to train with me for neurofeedback this April. Why is this surprising? Because they came all the way from Hong Kong to New York! What an honor for me to have people willing to travel so far to train with me twice. I don't take it lightly. I enjoyed working with them again and gave them a copy of my book to take home to Hong Kong. Even though I haven't made it to that part of the world yet, my book is there.



Thanks Ricky and Anson.

More reports on where the book has travelled to coming in the next issue of the newsletter.

Review of Artifact Issues in Biofeedback

New Products:

HRV Suite for Biograph

Zukor Game Software for Biograph and BrainMaster

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Anything that we end up recording that we didn't intend to record can be considered artifact.

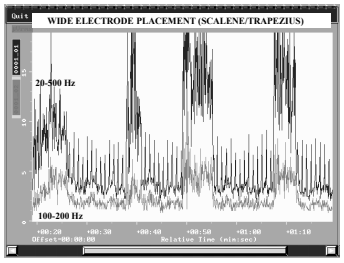
Biofeedback would be easier if we didn't have to deal with all of this equipment and the potential problems that come with it. I hope you're laughing. It can really get frustrating sometimes. Not only do we have to know how to run the software and attach the sensors but we also have to watch out for artifact and make sure that the signals we are recording and feeding back to the client are "clean". Anything that we end up recording that we didn't intend to record can be considered artifact. All signals are susceptible to artifact. Some more than others. The ones that seem to have the most potential for artifact are EMG, EEG, and EKG. These are all electrical signals. Because the EMG, EEG, and EKG signals are very tiny the instruments that measure them have to be very sensitive to detect them. We are measuring from sensors placed on the surface of the skin. The source of the signal that we are measuring is sometimes deep below the skin. The signals produced by the muscles, brain, and heart have to travel from their source through body tissue including fat, connective tissue, blood vessels, bone (skull), and fluids within the body. Once the electrical signal makes it to the surface of the skin it may also have to try to make it through oil, lotion, makeup, and hair products to make it to the electrodes or sensors. It then may have to travel through a wire before the small signal is finally amplified so that it is large enough for us to work with. This is why skin preparation with skin prep pads with alcohol and abrasive material and or a skin prep solution like Nuprep is so important. Skin prep including abrasion combined with the conductive cream, paste, or gel that is placed on the electrode surface improves the conductance or flow of electricity from the surface of the skin into the electrodes.

Some of the major sources of artifact are:

Electrode/skin artifacts

Electrical signals produced by the electrode/skin interface and/or the electrode wire moving through and electromagnetic field

•Skin movement beneath the electrodes



•Electrode lead artifact

•Skin/electrode artifact

•Gel-bridge artifact

To minimize electrode/skin artifacts prep skin well with skin prep pads and or skin prep solution like Nuprep. Put enough but not too much conductive gel, paste, or cream on the electrodes and place them securely on the skin. Applying too much can cause artifacts like gel-bridge where the gel creates an electrical connection between two electrodes. This can create unreliable readings. Secure electrode cables using tape or clips to the subject's clothing or the chair to reduce cable movement.

Environmental electrical artifacts

The common electrical signals present in the environment

•60Hz

•Other electrical generators: TV, computers, refrigerators

To minimize environmental electrical artifacts place your equipment at least two feet away from your computer and computer screen. Avoid placing the equipment near high power electrical equipment, lighting, computer power cables and the like. Make sure electrode cables are not near any of this equipment either.

Biological artifacts

The electrical signals produced by the body and recorded by the sensors

•Heartbeat artifact

•Nearby muscles

To avoid biological artifacts when recording EMG use a narrow filter when applying sensors to the trunk of the body. Place the sensors close together and at a diagonal angle if possible. Place sensors equal distance apart on the belly of the muscle you intend to record from.

When recording EEG teach the subject muscle relaxation prior to recording EEG especially from temporal and frontal placements. If you detect EKG in the EEG signal try moving the scalp sensor slightly to possibly avoid the blood vessel you may be picking up.

Military Service Related Traumatic Brain Injury

We have talked about this before but it keeps coming up in the news. Traumatic brain injury might not be a growing problem. It may just be that the knowledge that we have about the brain in growing. Dr. Jorge Palacios, who is on our faculty is experienced in the area of using neurofeedback and biofeedback for traumatic brain injury. He suggested that I read the February 2015 National Geographic article *The Invisible War on the Brain.* A few days later the issue showed up in my mail since I have a subscription. The cover pictures a decorated soldier holding a scared mask with part of the top of the head missing exposing the brain. The caption reads "*Healing Our Soldiers, Unlocking the Secrets of Traumatic Brain Injury*". I must say, Dr. Palacios does a better job of keeping up on the new research that comes out related to the brain than I do. I learn much of what I learn just from talking with him regularly.

The article starts out by stating that brain trauma from blast force is the signature injury of the Iraq and Afghanistan wars. The numbers are staggering. These brain trauma injuries affect hundreds of thousand of U.S. combat personnel. That's right HUNDREDS OF THOUSANDS of U.S. combat personnel. Please remember that this seems to just be talking about brain injury caused by blast force not necessarily actually being hit by an actual object. The numbers would then be much larger if those actually injured by being hit by an object are included. Here is a quote from the article "Body armor can stop shrapnel, but nothing can stop blast waves."

How can this happen? Just because we cannot see something doesn't mean that it doesn't exist and that it cannot have an effect or be experienced. Think about all of the invisible things we take for granted. We use cell phones, Wi-Fi, Radios, Bluetooth, TVs, remote controls for many of the devices we use, automatic starters for our cars and on and on. All of these rely on invisible energy that moves through space.

According to the article, research shows that a blast causes an increase in the pressure inside the skull. It causes the brain to move inside the skull. The blast wave affects the brain as soon as it makes contact with the skull. This is all happening very quickly. Scientists measure the effects in milliseconds. That being said, the effects on the brain and thus the person can last a lifetime.

The U.S. Marine Corps Weapons Training Battalion Dynamic Entry School did a study involving observing breachers who are soldiers who set explosives. It has been reported for years that these breachers tend to have neurological problems more often than usual.

In the study, the students and teachers in a two-week explosive training program were followed. The subjects reported that after larger explosions they had felt pain in their chest and back that felt like they had been punched for days after. They also reported headaches. The instructors also showed declining performance on neurobehavioral tests. This showed that being exposed to relatively low level blasts for even two weeks can cause damage to the brain. Some of our service people have been on multiple tours. Some have served in multiple wars. How many blasts of a stronger force have some of them been exposed to?

When you think about it the human cost is huge. It is devastating to real people and families. This not only affects U.S. service people (men and women). It also affects service people in the military of other countries both allies and enemies. There is also the collateral damage that affects non-military people who happen to live in the areas where the blasts occur when they happen in war.

A sampling of the effects that seem to be caused by these blasts include: headaches, insomnia, personality changes, mood disorders, anger, attention and memory problems.

It also seems that people who suffer blast injuries are more susceptible to psychological problems.

It has also been shown on diffusion tensor imaging tractography that connections in the brain are broken in victims of severe traumatic brain injury. If you haven't seen one of these images check our Face Book page and the NG article .

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Harry L. Campbell

Mid-Atlantic Society for Biofeedback & Behavioral Medicine

On April 25, 2015, the MidAtlantic Society for Biofeedback and Behavioral Medicine held its annual Spring Conference featuring an all day presentation by Martin Wuttke, on using meditation, neurofeedback and complementary protocols to resolve dependencies, addictions and other unhealthy habits.

His presentation was inspirational, informative, and enjoyable. It has been a while since I heard his story of overcoming addictions himself and then being inspired to dedicate much of his life to helping others find the path to recovery.

One of my main take-aways was about how not everyone can or needs to do alpha-theta

training including for substance abuse. Most of us are familiar with the Peniston Protocol for addictions. It is not a one size fits all. Many people have so much dysregulation going on in their brains that taking them into an Alpha/Theta state right away could be a mistake. The results could include negative effects including abreactions and other undesirable symptoms. Regulating the brain with other protocols like SMR or Z-Score training can help to "normalize" the brain. In some cases that may be all that is needed. In other cases it might prepare the brain to be able to deal with the Alpha/Theta protocol training with more positive results.

Other tools including nutrition counseling, magnetic therapy, and yoga were also reviewed.

Marty finished off his presentation by taking the group through a meditation exercise.

It was a good day. I learned a lot and got a chance to catch up with friends, clients, and I met some new people who I hope to see again at the fall conference.