Corporate Peak Performance Project

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Sixteen partners at a financial services firm participated in an on-site neurofeedback training program. The training was provided in a group format at the work site, with three participants training simultaneously. Sixteen partners commenced training, and 15 completed the training. The EEG training protocol rewarded increases in the SMR range in order to enhance focus, and decreases in the theta and high beta (hibeta) ranges, to reduce impulsiveness and anxious thinking. A posttraining questionnaire showed significant positive results for a majority of the participating executives on several variables, including improved focus, reduced impulsiveness, reduced anxious thinking, improved sleep, and improved productivity.

Houston based nonprofit, Southwest Health Technology Foundation (SWHT), and its subsidiary Neurotherapy Center of Houston, have been pioneers in bringing peak performance neurofeedback training to public school children. As an outgrowth of that work, SWHT partnered with a midsized financial firm in Houston, Texas to explore the efficacy of utilizing neurofeedback for peak performance in the workplace.

Logistics

A plan was developed to offer “Peak Performance” training to the partners at the financial firm to improve focus and productivity. The concept was initially proposed to all 30 partners. Sixteen partners and one spouse signed up. One partner dropped out during training due to schedule conflicts and workload. One of the most common objections to training is fitting frequent sessions into a busy schedule. To address this concern, the training was offered on-site at the financial firm’s office. The firm provided a small conference room for this purpose. Partners received 30 neurofeedback sessions conducted around a table with three partners working at the same time. Sessions were conducted twice weekly on Tuesday and Thursday. Training was conducted using BrainMaster® software and equipment running on laptop computers.

Protocol

All participants trained utilizing a protocol commonly referred to as Peak Performance. This protocol was chosen because it is safe and effective across a broad audience without the need for a quantitative EEG. This choice improved economic feasibility and kept the training in the educational realm, as opposed to a clinical intervention.

Sessions were 30 minutes in duration. The active electrode placement was at Cz based on the 10–20 system, which is at the top of the motor strip. Reference and ground electrode placement was on the earlobes. In each 30 minute session, participants received visual and auditory rewards for meeting criteria. Rewards were stock BrainMaster games and animations. Criteria were met by a participant when three specific brainwaves met threshold conditions. Sensory motor rhythm (SMR, 13–15 Hz) was “trained up” (rewarding increased amplitudes). Theta (3–7 Hz) and hibeta (20–30 Hz) were “trained down” (rewarding decreased amplitudes).

Training-increased sensory motor rhythm activity typically produces a calm, focused state and is correlated with improvements in sleep, fine motor control, and stress resilience. Training reductions in hibeta is associated with reduced stress, anxiety, and tension.

Results

Participants wanted to improve focus and increase productivity. Amplitude changes, measured in microvolts (μV), were examined in each frequency range for each participant. Additionally, a survey was developed and distributed to each partner after training was completed. The survey asked partners to rate their perceived level of change in multiple categories including focus, the ability to stay “plugged in” during meetings, stress, productivity, and other similar criteria.

Focus (Sensory Motor Rhythm)

Many of the partners wanted to improve their focus and feel more plugged in at meetings. Positive SMR changes from the first to the last session were noted as an indicator of an increase in the ability to focus. The majority of the
SMR change (63%) was positive, but none dramatic, with the biggest improvement being an SMR amplitude increase of 0.8 μV. However, according to the survey results, 19% of the participants reported a major positive change in focus, 31% moderate positive change, and 25% of participants reported no change in focus. Survey results pertaining to staying plugged in during meetings revealed 13% of participants experienced a major positive change, 44% reported a moderate positive change, and 19% reported no change.

**Impulsivity (Theta)**

Overall theta amplitude change was examined as well as changes in the morphology of the theta waveform from the first to last session. Although there was no statistically significant change in theta level (standard deviation of 1.54 μV), there were substantial changes in waveform. All participants learned to regulate their theta, as evidenced by smoother waveform at the end of the training program. Smoother waveform typically correlates to better impulse control. Participants reported significant changes in survey items that relate to reductions in impulsivity, with 44% reporting that it takes longer to get angry or feel rage. The contrast between Figure 1 and Figure 2 illustrates a typical change in theta waveform as well as in other frequency ranges. Forty percent of participants reported moderate to major positive changes (20% major and 20% moderate) when dealing with “other people’s drama.” Additionally, 63% of participants (25% major and 38% moderate) reported having the ability to better move on from negative experiences.

**Stress (Hibeta)**

Once training began, it became evident that stress was the most pressing problem for the partners, due to the fast-paced.
high-pressure field of financial services. One quarter (25%) of the partners reported a major decrease in stress and 13% reported a moderate decrease in stress. Reduced stress appeared to also be reflected in improved sleep. Ten out of 16 partners dropped their hibeta levels, with a mean change in amplitude of $-38 \mu V$.

**Sleep (Delta)**

At the start of the program, all 16 participants were delta dominant. Delta dominance can indicate, among other things, that a person is sleep deprived. Although only two were no longer delta dominant post-training, 50% reduced their delta. The standard deviation for change in delta was $2.7 \mu V$. Training also provided awareness of the need for higher quality sleep and how a lack of sleep affects performance. The survey revealed that 57% of participants experienced positive changes in sleep. Most changes were mild, but 26% reported moderate to major positive changes in sleep.

**Productivity and other changes**

Although the partners as a group were already extremely productive by objective standards, the group was interested in further increasing their productivity. Moderate positive change in productivity was reported by 31% of participants and minor positive change by 31%. There were also modest improvements in confidence (69% any improvement), optimism (50% any improvement), and memory (38% any improvement). Most participants reported that they enjoyed the process and 63% said they would recommend neurofeedback training to others.
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