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SUMMARY:

This is a quantitative and comparative analysis of cognitive efficiency in different stages of a cognitive training process + auditory neurofeedback of a 42-year old adult male in his workplace. Cognitive efficiency (as measured by Parrot Software cognitive programs) was defined as the best possible performance of the cognitive task while maintaining minimum stress and physiological strain. The training consisted of 9 sessions of 15 minutes each, at a rate of one session every other day where sessions were at the same time, same temperature, and in the same place. Under these conditions, the subject was presented with random computerized exercises along with three one-minute interruptions (cell phone calls) during each session. The exercises required the subject to read, remember, and execute three visuospatial related instructions. (e.g., “Place pen below book, place heart to the left of sun, place umbrella above cars”). Meanwhile, the subject's face and his computer screen were videotaped. At the same time his EEG was monitored at FZ (the active EEG electrode location according with the international 10-20 EEG location system) as well as his skin conductance and peripheral temperature. Additionally, an auditory neurofeedback threshold was established at two tenths of EEG voltage unit below his Beta: Theta average. According to Lubar et al, 1995; Linden et al, 1996; among others, a typical EEG on ADHD shows excess of a 4-7Hz range (theta brain wave) at frontal lobe and reduced 13-18Hz (beta brain wave), then a protocol to reinforce an attentive state of mind might be provided to the subject with any kind of reinforcement as soon as he/she increases beta and inhibits theta. Therefore, the subject was constantly warned about his attention level. Finally, behavioral research software was used to correlate, in milliseconds, the physiological data with the observable cognitive and behavioral variables captured on video. After analyzing and comparing sessions number 4 and number 9, it was evidenced that the subject’s cognitive performance improved by 75%, his cognitive recovery time was reduced by 37%, and his Beta: Theta was reduced by 37%. Additionally, the subject increased peripheral temperature (in °F) and he significantly reduced his electro dermal activity, meaning reduced stress while performing the cognitive task.