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"TECH TALK"

Audio-Visual Entrainment (AVE) & Seasonal Affective Disorders (SAD)

What is SAD?

Each year, 6% of northern populations are affected with Seasonal Affective Disorder (SAD) and another 14% have a milder form of SAD, called the *winter blues*. Surprisingly, SAD may occur at any time of year in equatorial regions although the ratio of northerners with SAD as compared to those living in the tropics is about 10-1.

Common symptoms of SAD are depression, anxiety, extreme fatigue, hypersomnia, carbohydrate cravings, and weight gain. Women through the ages of 20 to 40, their sexually reproductive years, are most susceptible (Rosenthal, 1993). The first controlled study using light therapy to treat SAD was published in 1984. SAD was officially accepted as a clinical malady in 1987 by the American Psychiatric Association and described in its then current diagnostic manual, the DSM-III-R. Since that time, a great number of studies on the topic have been completed.

Treating SAD

"Light Box" therapy has been traditionally used to reduce the symptoms of SAD in 60% to 80% of SAD patients (Lam, 1999). White light therapy, using intensities of 2,500 lux, requires exposure times from 2 to 6 hours, a considerable behavioral investment for the user (Terman, et. al., 1989). Light exposures in the intensity of 10,000 lux for 30 minute exposures has been found to be more effective than 2,500 lux intensity with exposure times of several hours (Terman, et. al., 1990). Some people have reported that over-use of light therapy can leave them feeling "wired" and restless (Rosenthal, 1993).

Audio-Visual Entrainment (AVE) using flashing lights and pulsing tones has been shown to enhance EEG activity at the stimulation frequency, however, a lesser known attribute of AVE lies in its inhibition effect at roughly the half-frequency of stimulation (Siever, 2003). In QEEGs (brain maps) collected at our office of those with SAD, we have observed long spindles of 10 Hz alpha brainwave activity, globally, with particularly increased activity in the left frontal regions, consistent with Allen's findings. In light of these findings, we had chosen to utilize 20 Hz AVE as a treatment modality for SAD.

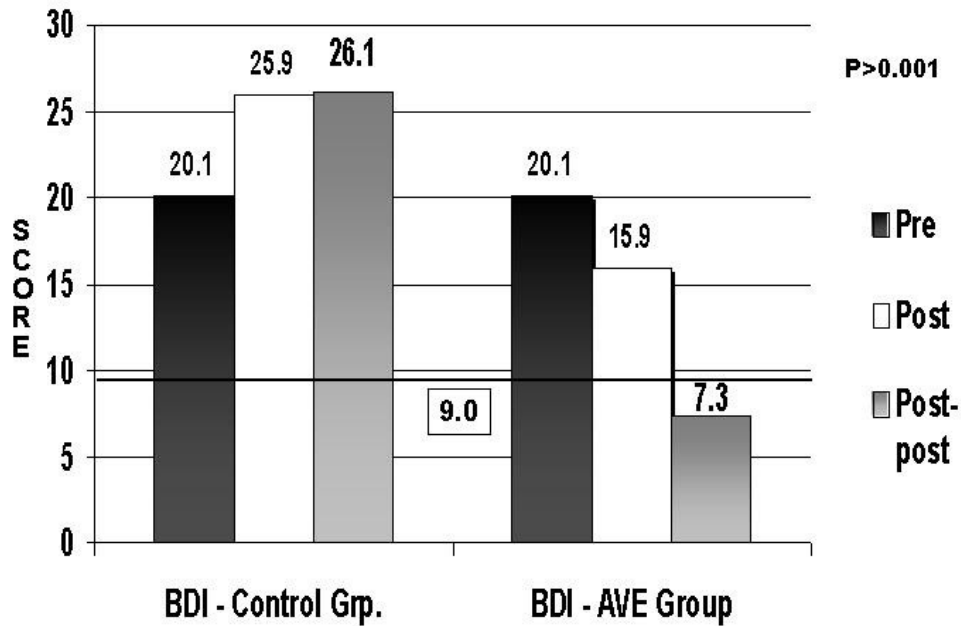
The SAD Study

The DAVID Paradise, by Mind Alive Inc., was used in a 4-week randomized study of 74 SAD sufferers (52 females and 22 males, avg. age = 38.5 years) to reduce the symptoms of SAD through the application of AVE.

The Beck Depression Inventory (BDI) and the Anxiety Sensitivity Index (ASI) were used for the pre-test, post-test (placebo), and the post-post-test (treatment) results. A daily diary was maintained to record total sleep time, sociability at work and with the family, eating, appetite and carbohydrate intake, cravings, energy and body weight.

The participants were divided into two groups: a Control Group (CG) that did not receive the DAVID AVE unit and the Treatment Group (TG) that received treatment sessions. The pre-test BDI score for both groups was 20.1. A score above nine indicates at least mild depression. Depression within the CG increased by 28% to a score of 26.1. In the TG, 100% of the participants had reduced depression (BDI = 7.3, $p < 0.001$), as shown below in Figure 1.

figure 1



Daily diary results indicated marked improvements. As shown in Figure 2, positive moods improved by 20%. Sociability at home with the family and at work improved by 22% and 40% respectively. As shown in Figure 3, AVE participants' food intake changed; over-eating decreased by 18%, appetite decreased by 12%, and carbohydrate intake decreased by 15%. The participants also reported happiness with their increased energy (avg. increase of 18%).

figure 2

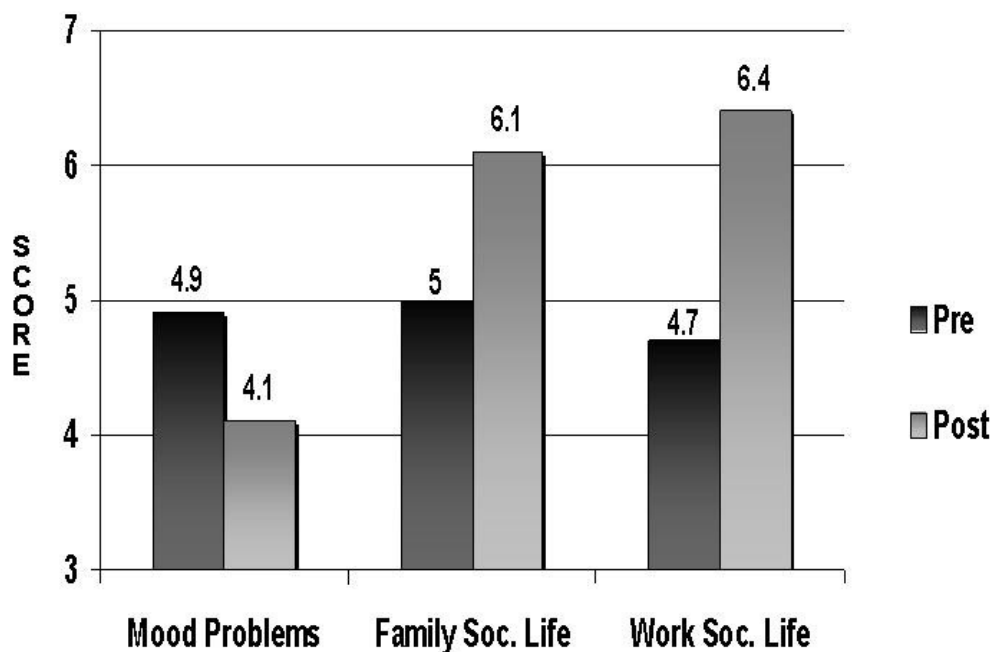
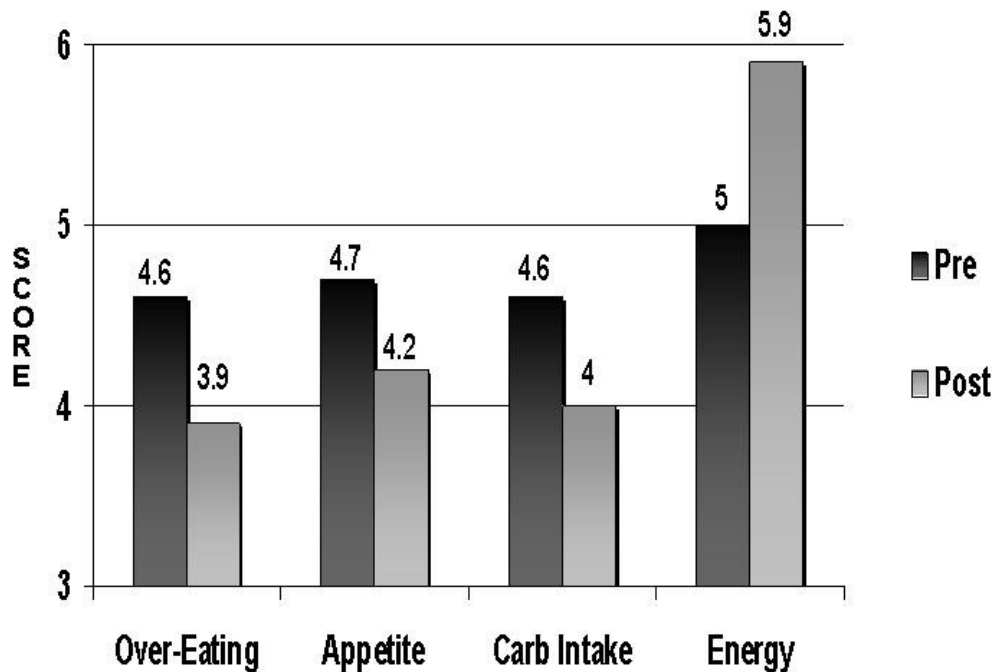


figure 3



White light AVE at 20 Hz produced significant results. The AVE Group's depression decreased while the Control Group's depression increased. Sensitivity to anxiety decreased in both male and female AVE groups. Although the female control participants had decreased sensitivity to anxiety, the female AVE population showed significance at the 20Hz stimulation.

Most control group participants claimed that they gained weight whereas an additional benefit of AVE is weight loss. One participant claimed that, "after using the 20 Hz session for 2 weeks, the taste of sweets in my mouth was repulsive." Follow-up reports indicate participants' SAD symptoms returned within an average of 2 weeks after discontinuing use of the DAVID AVE device.

Treatment with AVE

AVE devices can be very effective in alleviating the symptoms of SAD. There are two sessions that we recommend for the protocol; the Beta Perker with HRV Session (A3 in DAVID PAL, #4 in DAVID Paradise), and the Depression Reduction Session (C4 in DAVID PAL, #26 in DAVID Paradise). The Beta Perker has 20Hz stimulation for 20 minutes, but may cause anxiety in people that are prone to anxiety or who have suffered a major trauma. If this is the case, then we recommend the Depression Reduction Session. This session stimulates the left visual field (and therefore the right hemisphere) at 10Hz (alpha) and the right visual field (and the left hemisphere) at 18 Hz (beta). This session quickly settles down negative emotions from the right brain while stimulating the left brain to rebalance alpha asymmetry.