

Quantitative EEG Analysis Report

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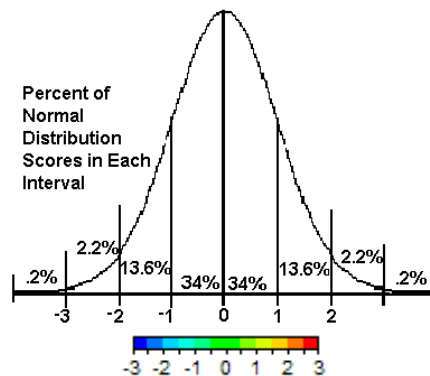
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Qeeg Functional Brain Interpretation

The purpose of this analysis is to compare electro-physiologic activity with standardized age normed data in order to gain clinical insights regarding how the cortex is organized. With these insights, the effects of the Holo form headphones can be observed while the subject listens passively.

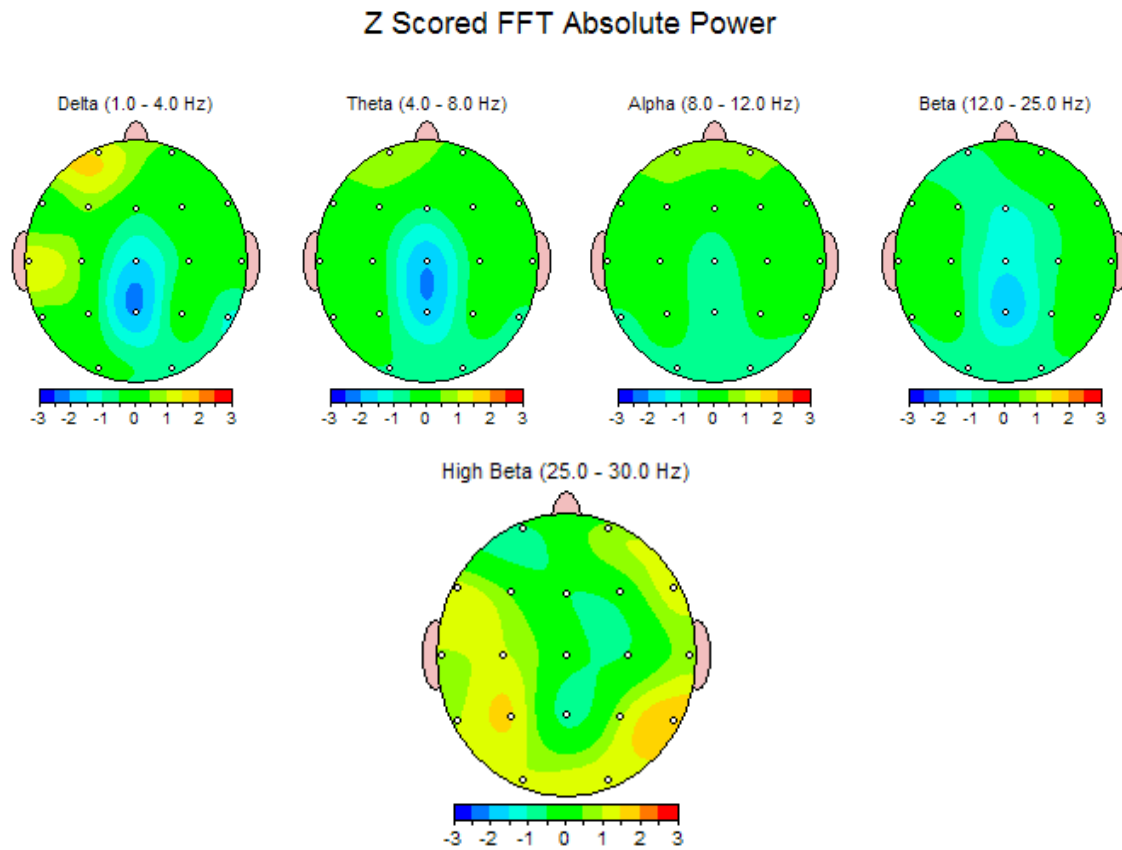
To assist in the analysis 21 channels of EEG data were collected consistent with the International 10/20 system. Routine EEG was recorded using a linked ear montage and with electrodes digitally referenced to the FZ electrode allowing for retrospective montage analysis of all data. User data gathered under technical conditions were selected and subjected to artifact removal and to the quantitative analysis of absolute power and mismatch negativity analysis for each condition, where indicated. The measurements are logarithmically transformed and referenced to age-adjusted population norms, when appropriate

Color coded key for reading the color brain maps and understanding standard deviation:



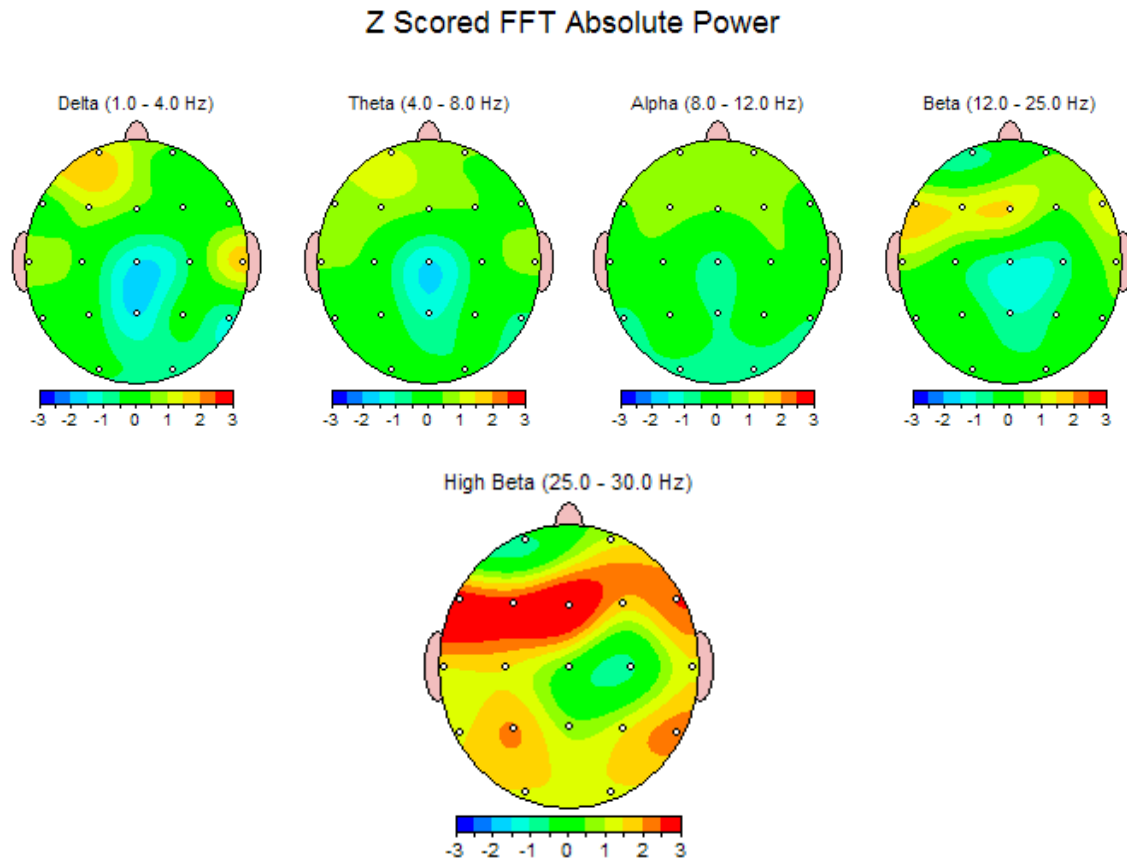
The Absolute Power colored brain maps are based on standard deviations above and below the norm, and color coded per the chart above accordingly. One standard deviation (SD) above the norm is yellow, two SD above the norm is orange, and three SD is red. '0' is the mean within the green and light green range. One SD below the norm is light blue, two SD below is darker blue, and three SD is darkest blue.

1. The maps below are from the first condition: subjects eyes closed, relaxing passively.



All bandwidths are within approximately 2 SD's from the mean.

2. The maps below are from the second condition: subjects eyes closed listening passively with the Holo Phone device.

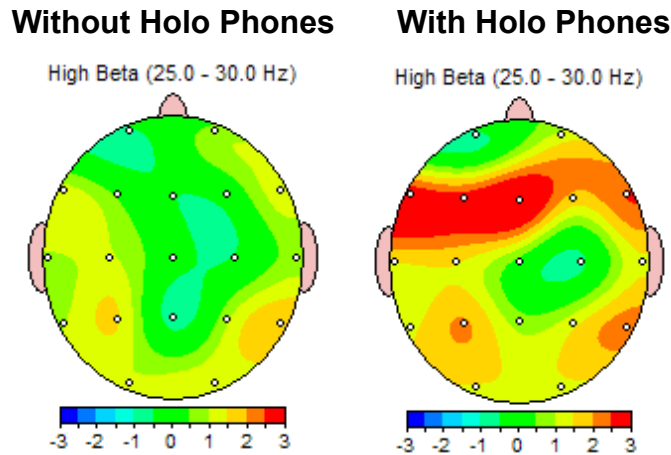


Note the significant (3 SD' s above mean) measured in the beta band 25-30 Hz. Localized at F7, F3 and Fz. This would correlate with left frontal lobe activation patterns referred to in the article and in Kemp, et al's work on Emotional Intelligence.

"In particular low left frontal lobe theta waves combined with raised frontal beta waves were correlated with higher EI measures. This is in accordance with findings that high theta/low beta measures are found in those with emotional difficulties including attention hyperactivity deficit disorder." (Kemp et al. 2005).

Although the low left frontal lobe theta waves are not present, beta is significant enough to reflect the same positive emotional states identified by Kemp et al.

Comparative view:



From: <http://www.ukessays.com/essays/physiology/emotional-intelligence.php>

The 10 original facets of Emotional Intelligence proposed by Salovey and Mayer.

Introduction

Emotion is a relatively difficult concept to clearly delineate but it is generally accepted that it is an organized mental response that includes physiological, experiential and cognitive aspects (Mayer et al. 2001). Emotions are largely, but not exclusively, related to interpersonal relationships and specific emotions are relatively resistant to cultural and individual differences, although these can affect the way in which emotions are expressed or perceived.

A new method of measuring EI via self-report is known as the Brain Resource Inventory for Emotional intelligence Factors (BRIEF). BRIEF assesses the perception of emotion in self and others. When measured using BRIEF females perform better than males **and the activity in the frontal lobes was strongly correlated with performance.** In particular low left frontal lobe theta waves combined with raised frontal beta waves were correlated with higher EI measures. This is in accordance with findings that high theta/low beta measures are found in those with emotional difficulties including attention hyperactivity deficit disorder (Kemp et al. 2005).

Kemp, A.H., Stephan, B.C., Hopkinson, P., Sumich, A.L., Paul, R.H., Clark, C.R., Gordon, E., Bryant, R.A. & Williams, L.M. 2005, "Toward an integrated profile of

depression: evidence from the brain resource international database", J.Integr.Neurosci., vol. 4, no. 1, pp. 95-106.

Discussion:

From our findings further investigation into the effects of the Holo Phone device as a potential means to increase Emotional Intelligence because of the activation of the neural networks associated with positive emotion, is indicated. Other interventions have been explored to raise brain activation in the frontal lobes to treat depression including electrical stimulation implants, medications, and biofeedback training using brain activity as feedback (Neurofeedback). The negative effects of implants and medication have been documented. Neurofeedback has demonstrated efficacy in numerous studies, however, the training and effect take more than 20-40 hours of total feedback time. The potential of the Holo Phone device, however, is that in a short period of time, the desired activation can be induced and, as far as we can tell, with no negative effects. The subject we studied in this brief analysis has experience with EI and it would be interesting to correlate his subjective experience with our findings above.

The "Holo-Phone" device is another of Bob Dratch's holo-form products. It is a "hardware holoform processor" as opposed to a real-time streaming software system. The bottom line is "wireless" (no invasiveness, no drugs) induced change and such was able to be documented with conventional EEG equipment.