

EEG Hemispheric Activation in Schizophrenia

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The general hypothesis guiding the present research is that psychopathology, in general, and schizophrenia, in particular, is associated with deviant patterns of central nervous system excitability. This excitability, in turn, is reflected in appropriate EEG measurements, especially hemispheric EEG. For example, recent research has suggested that schizophrenia is most often associated with non-specific overactivation of the dominant hemisphere as well as a functional disconnection between hemispheres.

The generalizability of these findings, however, is limited due to numerous methodological considerations including inappropriate or lack of controls. Additionally, relatively little has been attempted behaviorally with regards to altering the excitability of the observed patterns. Assuming that the inappropriate hemisphericity is indeed directly reflective of CNS excitability, one would suspect that a reduction of this excitability would alter the inappropriate EEG activity.

To explore these issues, 28 inpatients from a large state hospital volunteered. Individuals were right-handed males between the ages of 18 and 35 with a minimum of a sixth grade education. None had history or exhibited symptoms of organicity. Half of the volunteers were diagnosed as schizophrenic while the remaining 14 had received a diagnosis of anti-social personality. Diagnoses were ascertained independently by a psychologist and psychiatrist using DSM III criteria. Using random assignment technique, one half of each diagnostic category was assigned to a meditation training group while the other half was assigned to a waiting list control. Meditation training was performed according to the methods described by Benson (1975).

Half wave EEG hemispheric activity was recorded from the O1 and O2 sites during three phases. In phase I, subjects sat quietly for 10 minutes with eyes open. During phase II, individuals performed three separate eye activation exercises. In the last phase, participants practiced either the learned meditation method or a self-developed ("relax as best as you know how") method. Hemispheric activity was recorded according to Sharp, Smith, and Surwillo (1975). During each phase, 50 half-waves were sampled about the midpoint of the phase in question. Halfwaves of 10ms or more in duration which met a minimal voltage requirement (5mv or more) were dumped into binwidths of 5ms (up to 100).

Results indicated that significant differences between groups were observed in at least several of the binwidths (especially 10, 15, 20, and 25 ms) across all phases. Differential responding was also noted according to phases as well as to hemispheres. While differential responding was observed in both baseline and eye activation phases, the largest differences were recorded during the practice phase. In addition, left hemisphere activity differentiated groups more clearly. Indeed, results suggest that schizophrenics exhibited significantly greater left hemisphere activation than sociopaths (especially during practice of the meditation).