

SCHIZOPHRENIA: EVENT-RELATED POTENTIALS AND COGNITION

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Event-related potential (ERP) research has demonstrated a correspondence between changes in electrical activity and cognitive events. This study investigated the link between thought disorder in schizophrenia and event-related potentials. The aim was to see whether abstract vs. concrete thought differences existed between normals and schizophrenics, and further, to see if such differences were reflected by changes in the voltage, latency, or topography of the ERPs. The study was based on four conceptual underpinnings: 1) abstract vs. concrete thought; 2) categorization research; 3) hypofrontality hypothesis; and 4) ERP research. The abstract vs. concrete thought approach to schizophrenia has been criticized for not withstanding empirical scrutiny; however, research has identified a primary level of categorization (basic-level) that characterizes concrete thought in ways that seem congruent with clinical descriptions of concreteness in schizophrenia. Therefore, it was possible to define both concrete and abstract thinking in more rigorous operational terms. From the biological domain, some work suggests that the frontal cortex subsumes abstract thinking, and that the post-central region is engaged during concrete processing. Further, the hypofrontality hypothesis suggests that reduced schizophrenic frontal activity might be linked to deficits in abstract thinking. Lastly, while ERP research based on early (<100 msec) and mid (P300) components in schizophrenia has been mixed, there has been little emphasis on the relationship between types of thinking in schizophrenia and changes in later ERP components. This study used an S1-S2 categorization paradigm to elicit abstract and concrete thinking in subjects. ERPs from three midline electrodes: Fz, Cz, and Pz (referenced to linked mastoids) were measured to test for differences in localized cortical activity related to different types of thinking. Subjects, matched for sex, age, and IQ, included 10 hospitalized schizophrenics (RDC and DSM-III-R diagnosed) and 10 normals (MMPI assessed). The contributions of this study are three-fold: 1) a psychophysiological paradigm comprised of clinical, cognitive, and electrophysiological procedures; 2) new operational definitions of the abstract-concrete approach to schizophrenic thought disorder; and 3) an examination of the link between types of thinking and ERP activity in schizophrenia. An important implication of this study is its potential as a prototype for future research using a psychophysiological paradigm that would use ERPs to subdivide schizophrenia. Other implications for future research include a more objective measure of thought disorder, and an evaluation of various schizophrenic treatment modalities.