A Two-State Analysis of ERP Activity Measures and fMRI Activations Relevant to the Detection of Deception MICHAEL SCHILLACI[1], JENNIFER VENDEMIA[2], ERIC GREEN, ROBERT BUZAN, SCOTT MEEK, MICHELLE PHILLIPS, University of South Carolina — A novel analysis approach for high-density event related scalp potential data (ERP) gathered druing various scenarios is presented. We construct energy-density functional clusters using the empirical voltage and power values and extract extrema of these cognitive activity mesaures to assess the temporal dynamics in areas of physiological significance for the detection of deception. These studies indicate that for questions relating to autobiographical knowledge neocortical interaction times are greater for deceptive responses. This finding is reproduced when workload requirements are increased and suggests that a "neocortical circuit" involving activity in short-term memory, visual processing, and executive control regions of the cortex is present. Individual and group analyses are given and continuing experiments involving questions where misinformation is used illustrate that early, up-front control may also be present during deceptive repsonses. A comparison of dipole source models with fMRI data collected in our lab confirms that BOLD activation in the ROIs is consistent with our model of deception.

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