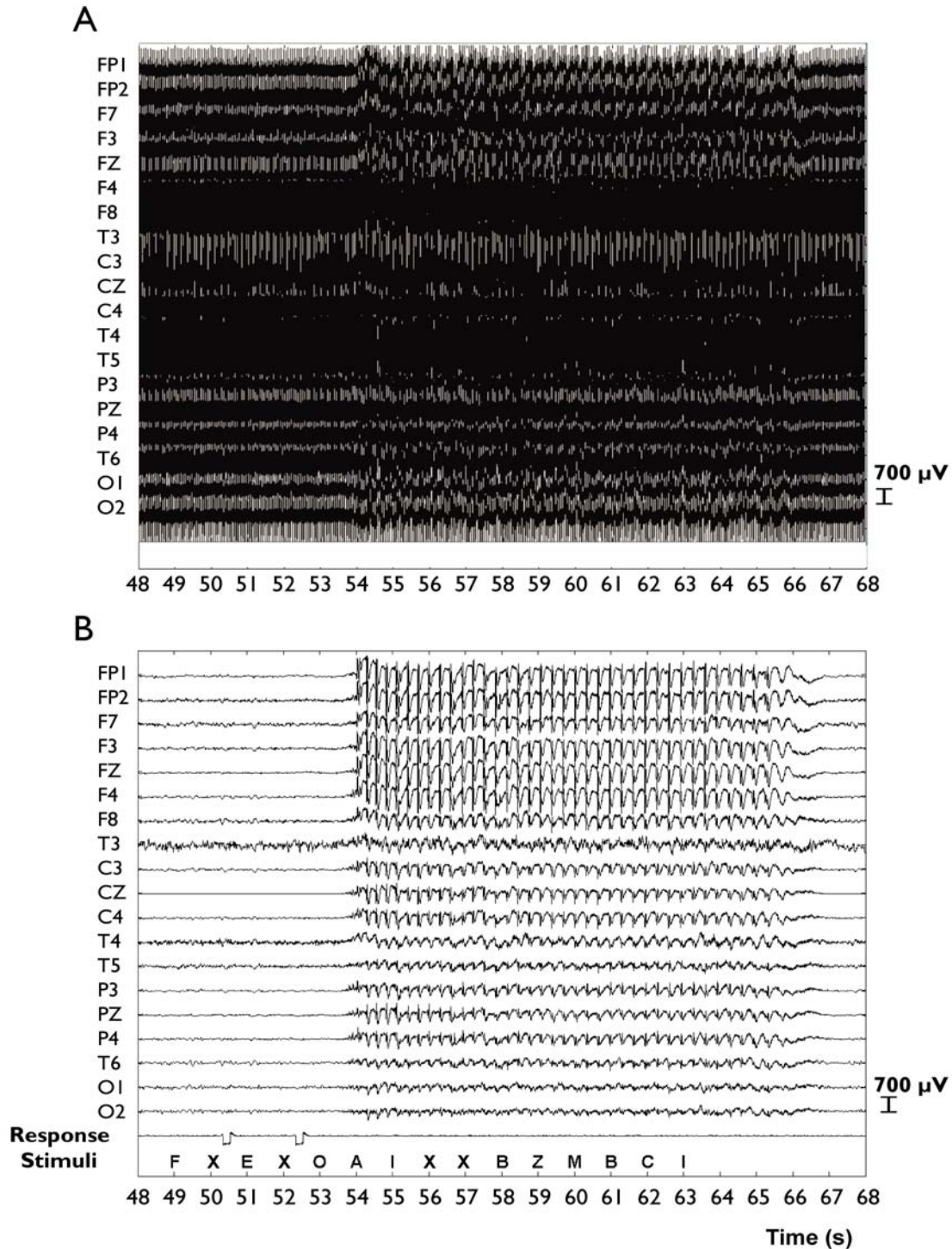
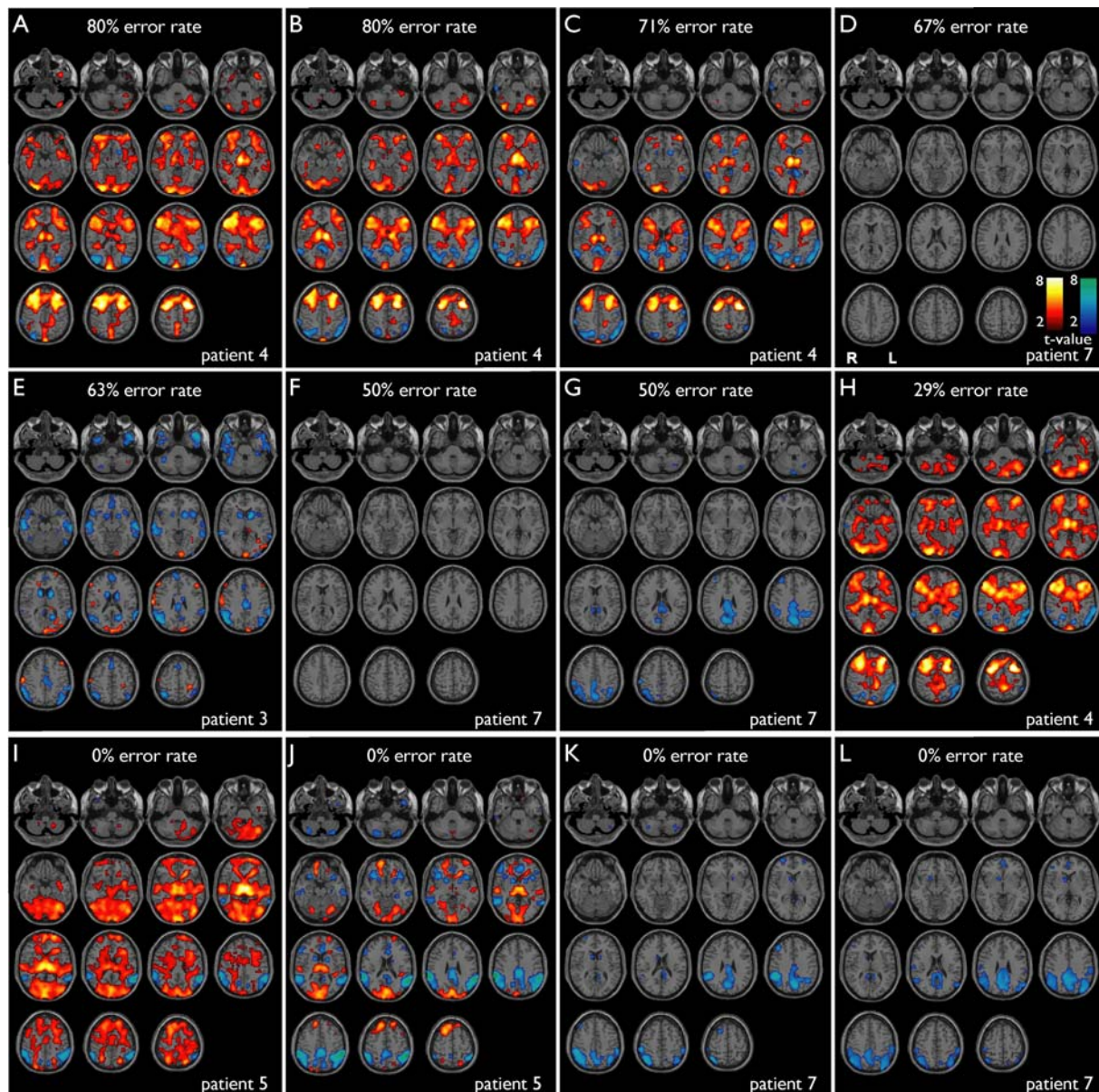


Supplementary Figure 1



Supplementary Figure 1. Simultaneous EEG, fMRI and behavioral testing with artifact removal. Linked-ears referential EEG recording of a 12 second absence seizure in Patient 1. **a)** EEG prior to adaptive PCA-based artifact removal and **b)** EEG from the same seizure after artifact removal. The recording shows a typical large amplitude bilateral 3 Hz spike-wave discharge. The patient responded to target X during CPT testing prior to seizure onset (voltage deflections on EEG channel labeled "Response"). However, when the targets occurred during the seizure, the patient was unable to respond. fMRI signal changes associated with this seizure are shown in Figure 1a.

Supplementary Figure 2



Supplementary Figure 2. fMRI changes during individual seizures with good vs. poor performance on RTT. SPM results are shown with 6 motion related parameters included in the modeling. No consistent differences were seen between fMRI changes during seizures with impaired performance (**a-h**), compared to seizures with good performance on RTT (omission error rate = 0%) (**i-l**). **a**) Patient 4, seizure duration = 5.8 s, omission error rate = 80%. **b**) Patient 4, seizure duration = 6.8 s, omission error rate = 80%. **c**) Patient 4, seizure duration = 6.6 s, omission error rate = 71%. **d**) Patient 7, seizure duration = 2.7 s, omission error rate = 67%. **e**) Patient 3, seizure duration = 7.6 s, omission error rate = 56%. **f**) Patient 7, seizure duration = 1.8 s, omission error rate = 50%. **g**) Patient 7, seizure duration = 1.7 s, omission error rate = 50%. **h**) Patient 4, seizure duration = 6.6 s, omission error rate = 29%. **i**) Patient 5, seizure duration = 6.4 s, omission error rate = 0%. **j**) Patient 5, seizure duration = 8.2 s, omission error rate = 0%. **k**) Patient 7, seizure duration = 2.7 s, omission error rate = 0%. **l**) Patient 7, seizure duration = 1.9 s, omission error rate = 0%. Performance data on RTT is shown in Figure 3b. Warm colors represent fMRI increases, and cool colors decreases. SPM analysis threshold $P=0.05$, FDR-corrected, and extent threshold $k=3$ voxels.