

Abstract View

EVENT-RELATED BOLD ACTIVATION OF THE OPTIC RADIATION.

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Independent Component Analysis (ICA) was applied to the fMRI BOLD time series obtained in event-related fMRI studies (Bruker 3T MR imager, TR=500 ms, TE=70 ms, flip angle = 90 degrees; matrix = 64x64; FOV = 250x250 mm; slice thickness = 5 mm with 2-mm gaps). Six subjects (2 males and 4 females, aged 22 +/- 3 yr) participated in 2 separate sessions each comprising ten 30-sec epochs. 8 Hz bursts of flickering-checkerboard visual stimulation was presented during the first 0.5 s of each epoch. The event-related fMRI time series data were first subjected to slice-timing adjustment, off-brain removal and principal subspace dimension reduction (to 100 dim.). Infomax ICA (<http://www.cnl.salk.edu/~scott/ica.html>) was then used to segregate the resultant fMRI BOLD signals into task-related brain responses, other brain processes, and machine/environmental noise. For each subject, ICA returned a component active in the optic radiation of the visual pathway, plus one or more components active in the V1 cortices. The time courses of these two component types had different onset latencies and waveforms. The event-related activation of the optic radiation preceded the activation of the V1 cortices. In addition, the time course of the optic radiation had larger peak-to-peak amplitudes and longer duration. ICA is sensitive method for separating event-related activations in brain processes within small regions of the brain.

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