

SUPPLEMENTAL MATERIAL

Supplemental Methods

Participants

Candidates were selected from the University of Kansas Medical Center stroke database between 2006 and 2009. Out of a 134-candidate pool, 29 met inclusion criteria (i) single ischemic stroke six months previously, (ii) no chronic/degenerative disease predating the stroke and affecting the central nervous system, and (iii) no MRI contraindications. Of these, 9 patients were excluded for severe hemiparesis (FMUE<10, 17%) or claustrophobia (14%). Thus, 20 participants were enrolled. All but six completed the protocol. These six were excluded due to stroke location after the inspection of T₂-weighted images (cortical stroke affecting M1 or cerebellum).

Exclusion criteria included: (i) other neurological disorders (medical chart review); (ii) receptive aphasia (Token test); (iii) visual attention deficits (Cancellation test); (iv) apraxia (clinical observation of the use of scissors to cut paper and making coffee); and (iii) contraindications to MRI.

Experimental protocol

The total scan duration for both fMRI and ¹H-MRSI was about 45 min. Participants' heads were immobilized with head cushions and instructed not to move during scanning.

BOLD acquisition: During BOLD scan, instructions were presented through MRI-compatible goggles. To ensure similar performance, participants performed the handgrip until the target pressure (25% of MVHG) was attained, at which point the grip was released. In the rest condition, a sign instructed the participants to lie motionless.

BOLD analysis: Functional MRI data were analyzed using Brain Voyager. Motion correction was performed by a rigid body transformation, estimating three translation and three rotation parameters. These parameters were inspected for head movement. None of the participants moved their head >2mm in any direction. Then, 3D spatial smoothing with a 4mm Gaussian filter was used to permit valid statistical inference according to the Gaussian random field theory. The time series in each voxel was high pass filtered at 0.01Hz to remove low frequency confounds. Movement and rest periods were modeled by a boxcar function with hemodynamic response modification (predictor movement).