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Procedure

Subjects took part in two experimental sessions, one behavioral and one in the fMRI scanner. In the behavioral session, participants watched the first part of the movie (approximately 46 minutes). Immediately after this session, participants went into the scanner and watched the remaining movie, divided into five parts. They were instructed to watch the movie without any additional task.

Imaging session

The imaging session comprised one anatomical (T1w) scan, one gradient echo (GRE) fieldmap estimation scan, and five functional runs. During the anatomical scan participants watched the last five minutes of the first part of the movie—which they watched in the behavioral session—to calibrate the sound volume for the scanner. They were asked to use a button box to increase or decrease the volume so that they could easily hear the dialogue. The volume chosen by the subject was used throughout the session without further modifications. The functional runs had a different duration depending on the part of the movie and ranged from approximately 9 to 13 minutes. Each run was padded with a 10 s fixation period both at the beginning and the end of the run. In all but the first run, the movie started with at least 10 s that overlapped with the previous run. The movie was presented to the subjects on a back-projected screen, and subtended approximately 16.27 × 9.17 (W × H) degrees of visual angle. The audio was delivered to the subject through MR-compatible in-ear head-phones (Sensimetrics model S14).

Imaging parameters

All functional and structural volumes were acquired using a 3 T Siemens Magnetom Prisma MRI scanner (Siemens, Erlangen, Germany) with a 32-channel phased-array head coil at the Dartmouth Brain Imaging Center. Functional, blood oxygenation level-dependent (BOLD) images were acquired in an inter-leaved fashion using gradient-echo echo-planar imaging with pre-scan normalization, fat suppression, a multib-and (i.e., simultaneous multi-slice; SMS) acceleration factor of 4 (using blipped CAIPIRINHA), and no in-plane acceleration (i.e., GRAPPA acceleration factor of 1): TR/TE = 1000/33 ms, flip angle = 59◦, resolution = 2.5 mm3 isotropic voxels, matrix size = 96 × 96, FoV = 240 × 240 mm, 52 axial slices with full brain coverage and no gap, anterior–posterior phase encoding. At the beginning of each run, three dummy scans were acquired to allow for signal stabilization. At the beginning of the imaging session, a single dual-echo GRE (gradient echo) scan was acquired. This scan was used to obtain a fieldmap estimate for spatial distortion correction.

A T1-weighted structural scan was acquired using a high-resolution single-shot MPRAGE sequence with an in-plane acceleration factor of 2 using GRAPPA: TR/TE/TI = 2300/2.32/933 ms, flip angle = 8°, resolution = 0.9375 × 0.9375 × 0.9 mm voxels, matrix size = 256 × 256, FoV = 240 × 240 × 172.8 mm, 192 sagittal slices, ascending acquisition, anterior–posterior phase encoding, no fat suppression, 5 min 21 s total acquisition time.