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Data Article

Functional magnetic resonance imaging data of incremental increases in visuo-spatial difficulty in an adult lifespan sample

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ABSTRACT

These data provide coordinates generated from a large healthy adult lifespan sample undergoing functional Magnetic Resonance Imaging (fMRI) while completing a spatial judgment task with varying levels of difficulty, as well as a control categorical condition. The data presented here include the average blood-oxygen-dependent (BOLD) response to the spatial judgment vs. the control task, as well as the BOLD response to incremental increasing difficulty; see also "Age-related Reduction of BOLD Modulation to Cognitive Difficulty Predicts Poorer Task Accuracy and Poorer Fluid Reasoning Ability" (Rieck et al., 2017) [1].

Specifications Table

Subject area	Cognitive Neuroscience
More specific subject area	Functional Magnetic Resonance Imaging of spatial judgment
Type of data	Coordinate tables, figures

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How data was acquired	Philips Achieva 3 T whole body scanner
Data format	Analyzed using Statistical Parametric Mapping 8
Experimental factors	
Experimental features	Participants performed a spatial judgment task in which they conducted two types of judgments. A categorical (LEFT/RIGHT) judgment was used as a control condition and a coordinate (NEAR/FAR) judgment was used with three levels of difficulty.
Data source location	Dallas, Texas, United States of America
Data accessibility	Data provided in article

Value of the data

- This dataset provides a sizable sample of healthy adults who performed a spatial judgment task.
- These data show differential BOLD responses for varying levels of visuo-spatial difficulty across the sample.
- The data provide specific MNI coordinates of brain regions evoked by the task.
- These data are potentially useful to investigators studying differences in fMRI activation to non-verbal, spatial stimuli across the adult lifespan.

1. Data

While undergoing fMRI, healthy adult participants completed a blocked-design spatial judgment task with three levels of difficulty (Easy, Medium, and Hard). These data have previously been analyzed with regard to age [1]. The data shown here represent the group level analyses examining the effect of the distance judgment task (Easy, Medium, Hard vs. Control – Table 1 and Fig. 1) as well as the effect of incremental increasing difficulty (Medium vs. Easy – Table 2 and Hard vs. Medium – Table 3, both shown in Fig. 2).

2. Experimental design, materials and methods

2.1. Participants

Participants included 161 healthy adults, ages 20–94 (mean age = 51.93 ± 18.9 years; 95 women; 66 men) who volunteered from the Dallas-Fort Worth area. Inclusion criteria for the study required that all participants be right-handed, fluent English speakers, and have normal or corrected-to-normal vision (at least 20/40). Participants were also screened for dementia using the Mini Mental State Examination (MMSE; [2]), with a cutoff of 26; volunteers were also required to have no history of neurological or psychiatric conditions, head trauma, drug or alcohol problems, or significant cardiovascular disease (however, $n = 32$ with a self-reported diagnosis of hypertension). Participants were compensated for their time and informed consent was obtained in accordance with protocol approved by the University of Texas at Dallas and the University of Texas Southwestern Medical Center.

2.2. Experimental design

The data shared here are from a large lifespan dataset in which 161 healthy adults completed a blocked-design distance judgment task while undergoing fMRI. The spatial judgment task involved two types of judgments (modeled after [3] and [4]). The first type of judgment, which served as the