Supplementary Materials

Scanning the Horizon: Future challenges for neuroimaging research.

Russell A. Poldrack[1], Chris I. Baker[2], Joke Durnez[1], Krzysztof J. Gorgolewski[1], Paul Matthews[3], Marcus Munafò[4,5], Thomas E. Nichols[6], Jean-Baptiste Poline[7], Edward Vul[8], Tal Yarkoni[9]

Supplementary Tables:

Paradigm	Anatomical mask (intersected with functional mask)	mask size	Cohen's D			Percent BOLD change		
			P10	median	P90	P10	median	P90
MOTOR	Precentral Gyrus	12894	0.158	0.628	1.070	0.505	2.707	8.582
	Supplementary motor cortex	3418	0.211	0.716	1.197	0.911	4.033	12.510
	Left putamen	1532	0.114	0.513	0.864	0.586	2.388	4.318
	Right putamen	1437	-0.008	0.369	0.749	-0.045	1.696	3.609
WM	Middle frontal gyrus	7116	0.101	0.474	0.837	0.130	0.986	2.504
EMOTION	Left amygdala	1133	0.265	0.534	1.065	0.516	1.198	3.379
	Right amygdala	1082	0.308	0.645	1.140	0.581	1.350	3.557
GAMBLING	Left accumbens	455	0.138	0.310	0.461	0.369	0.849	1.440
	Right accumbens	417	0.141	0.332	0.488	0.373	0.981	1.618

Table S1: Effect size estimates and their 10th and 90th percentile for common experimental paradigms. Linear mixed effects group analyses were performed using FSL[1] on 186 independent subjects from the Human Connectome Project[2] on four tasks (contrast): motor (average), working memory (2-back versus 0-back), emotion (fear-neutral) and gambling (reward-punish). The effect sizes given are the median effect sizes within the intersection of functional and anatomical masks, where the former is the result of a forward inference meta-analysis using neurosynth.org[3] with the search words equal to the paradigm, and the latter are masks derived from the Harvard-Oxford probabilistic atlas[4] with probabilities thresholded at 0. Data and code to generate this table are available at https://github.com/poldracklab/power .

Supplementary methods:

Figure 1: In a statistical map within an MNI template with smoothness of three times the voxelsize, we assume one active region with voxelwise standardised effect size D. The spatial extent of the region is relatively small: we expect only one local maximum in the region. The voxelwise statistical significance threshold is computed with random field theory[5] using FSL's ptoz function[1]. The probability that the local maximum exceeds this significance threshold is computed using the distribution of local maxima from Cheng and Schwartzman[6].

Figure 2: Simulated fMRI and behavioral data were generated from a Gaussian distribution for 24 simulated subjects, and the fMRI data were smoothed with a 6 mm Gaussian kernel. A univariate analysis was performed to assess correlation between activation and the simulated behavioral regressor, and the resulting statistical map was thresholded at $p<0.005$ and a 50 voxel extent threshold (i.e. a heuristic correction for multiple comparisons).

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