

Supplementary Table 1. Contributions of mean activation levels to classifier performance.

All p-values represent two-tailed t-tests against a chance AUC value of 0.5. For each region, experiment, and type of analysis, classifier performance is reported for the original data (as reported in the main manuscript and Table 1), the data with the mean activation value (across voxels, within each trial) subtracted out, a classifier based *only* on mean activity levels, and the data after Z-scoring across features (within each trial). Experiment 1: all degrees of freedom (df) = 15. Experiment 2: all df = 11. AUC = area under ROC curve.

A. Classification of item-specific scene information during perception

ROI	Experiment 1		Experiment 2	
	AUC	p	AUC	p
OPA (original data):	.579	.00071	.610	5.6x10 ⁻⁵
- mean subtracted out:	.583	.00091	.623	5.0x10 ⁻⁵
- mean-only classifier:	.489	.43	.514	.18
- Z-scored across features:	.580	.0015	.618	4.0x10 ⁻⁵
PPA (original data):	.598	4.9x10 ⁻⁵	.583	.0041
- mean subtracted out:	.595	.00011	.580	.0047
- mean-only classifier:	.534	.022	.557	.0016
- Z-scored across features:	.596	.00011	.579	.0039
RSC (original data):	.525	.069	.526	.067
- mean subtracted out:	.520	.12	.528	.050
- mean-only classifier:	.524	.024	.495	.72
- Z-scored across features:	.521	.10	.530	.045
PCu/IPS (original data):	.564	.00038	.548	.051
- mean subtracted out:	.568	.00058	.557	.020
- mean-only classifier:	.494	.58	.512	.30
- Z-scored across features:	.563	.00040	.559	.017
Combined (original data):	.627	9.1x10 ⁻⁶	.634	8.3x10 ⁻⁵
- mean subtracted out:	.633	1.1x10 ⁻⁵	.647	7.1x10 ⁻⁵
- mean-only classifier:	.500	.97	.513	.37
- Z-scored across features:	.631	1.9x10 ⁻⁵	.651	3.9x10 ⁻⁵
FFA (original data):	.574	1.3x10 ⁻⁶	.565	.014
- mean subtracted out:	.573	6.6x10 ⁻⁶	.567	.014
- mean-only classifier:	.521	.13	.507	.72
- Z-scored across features:	.572	4.4x10 ⁻⁶	.568	.012

B. Classification of item-specific scene information during imagery

ROI	Experiment 1		Experiment 2	
	AUC	p	AUC	p
OPA (original data):	.536	.042	.554	.0083
- mean subtracted out:	.538	.022	.555	.0087
- mean-only classifier:	.495	.639	.519	.12
- Z-scored across features:	.537	.034	.559	.0039
PPA (original data):	.529	.094	.503	.85
- mean subtracted out:	.525	.15	.501	.96
- mean-only classifier:	.500	.98	.517	.21
- Z-scored across features:	.529	.11	.500	.98
RSC (original data):	.537	.0057	.531	.031
- mean subtracted out:	.535	.0093	.522	.15
- mean-only classifier:	.479	.077	.499	.97
- Z-scored across features:	.537	.0048	.524	.11
PCu/IPS (original data):	.533	.025	.545	.055
- mean subtracted out:	.535	.016	.550	.041
- mean-only classifier:	.499	.91	.519	.084
- Z-scored across features:	.534	.011	.550	.038
Combined (original data):	.560	.0023	.558	.0064
- mean subtracted out:	.558	.0058	.561	.0063
- mean-only classifier:	.493	.44	.530	.015
- Z-scored across features:	.557	.0053	.567	.0029
FFA (original data):	.521	.14	.503	.82
- mean subtracted out:	.524	.069	.508	.50
- mean-only classifier:	.485	.27	.484	.40
- Z-scored across features:	.523	.071	.511	.37

C. Re-instantiation of item-specific information from perception to imagery

ROI	Experiment 1		Experiment 2	
	AUC	p	AUC	p
OPA (original data):	.517	.21	.515	.49
- mean subtracted out:	.520	.13	.512	.57
- mean-only classifier:	.501	.88	.510	.62
- Z-scored across features:	.521	.11	.514	.54
PPA (original data):	.544	.016	.536	.020
- mean subtracted out:	.542	.021	.531	.035
- mean-only classifier:	.543	.0037	.528	.023
- Z-scored across features:	.539	.022	.533	.039
RSC (original data):	.521	.12	.524	.040
- mean subtracted out:	.518	.17	.525	.036
- mean-only classifier:	.522	.017	.517	.31
- Z-scored across features:	.518	.20	.524	.036
PCu/IPS (original data):	.527	.017	.525	.11
- mean subtracted out:	.524	.043	.532	.034
- mean-only classifier:	.523	.032	.515	.21
- Z-scored across features:	.526	.051	.529	.059
Combined (original data):	.553	.0083	.561	.0077
- mean subtracted out:	.552	.011	.560	.0096
- mean-only classifier:	.522	.063	.513	.34
- Z-scored across features:	.551	.0098	.558	.014
FFA (original data):	.523	.13	.505	.75
- mean subtracted out:	.523	.13	.509	.54
- mean-only classifier:	.521	.052	.504	.73
- Z-scored across features:	.523	.14	.507	.61

D. Classification between the overall processes of perception and mental imagery

ROI	Experiment 1		Experiment 2	
	AUC	p	AUC	p
OPA (original data):	.870	3.2×10^{-8}	.893	5.0×10^{-9}
- mean subtracted out:	.870	2.8×10^{-8}	.893	4.9×10^{-9}
- mean-only classifier:	.779	4.7×10^{-8}	.796	9.3×10^{-8}
- Z-scored across features:	.867	3.5×10^{-8}	.889	4.4×10^{-9}
PPA (original data):	.844	1.2×10^{-7}	.831	8.6×10^{-7}
- mean subtracted out:	.833	2.6×10^{-7}	.822	8.9×10^{-7}
- mean-only classifier:	.812	5.8×10^{-9}	.803	1.7×10^{-8}
- Z-scored across features:	.835	2.4×10^{-7}	.820	6.8×10^{-7}
RSC (original data):	.729	1.7×10^{-7}	.727	2.4×10^{-6}
- mean subtracted out:	.722	2.9×10^{-7}	.726	1.4×10^{-6}
- mean-only classifier:	.568	.019	.599	.00012
- Z-scored across features:	.724	4.4×10^{-7}	.731	1.3×10^{-6}
PCu/IPS (original data):	.798	5.5×10^{-6}	.820	4.0×10^{-7}
- mean subtracted out:	.801	4.8×10^{-6}	.826	1.9×10^{-7}
- mean-only classifier:	.597	.00086	.616	.0033
- Z-scored across features:	.798	4.7×10^{-6}	.814	3.1×10^{-7}
Combined (original data):	.914	2.9×10^{-10}	.940	2.9×10^{-11}
- mean subtracted out:	.914	2.5×10^{-10}	.943	1.0×10^{-11}
- mean-only classifier:	.726	3.2×10^{-7}	.747	3.9×10^{-8}
- Z-scored across features:	.912	2.3×10^{-10}	.941	1.6×10^{-11}
FFA (original data):	.771	3.3×10^{-7}	.762	2.0×10^{-5}
- mean subtracted out:	.771	2.7×10^{-7}	.762	1.8×10^{-5}
- mean-only classifier:	.623	.0024	.569	.023
- Z-scored across features:	.764	3.5×10^{-7}	.764	1.2×10^{-5}