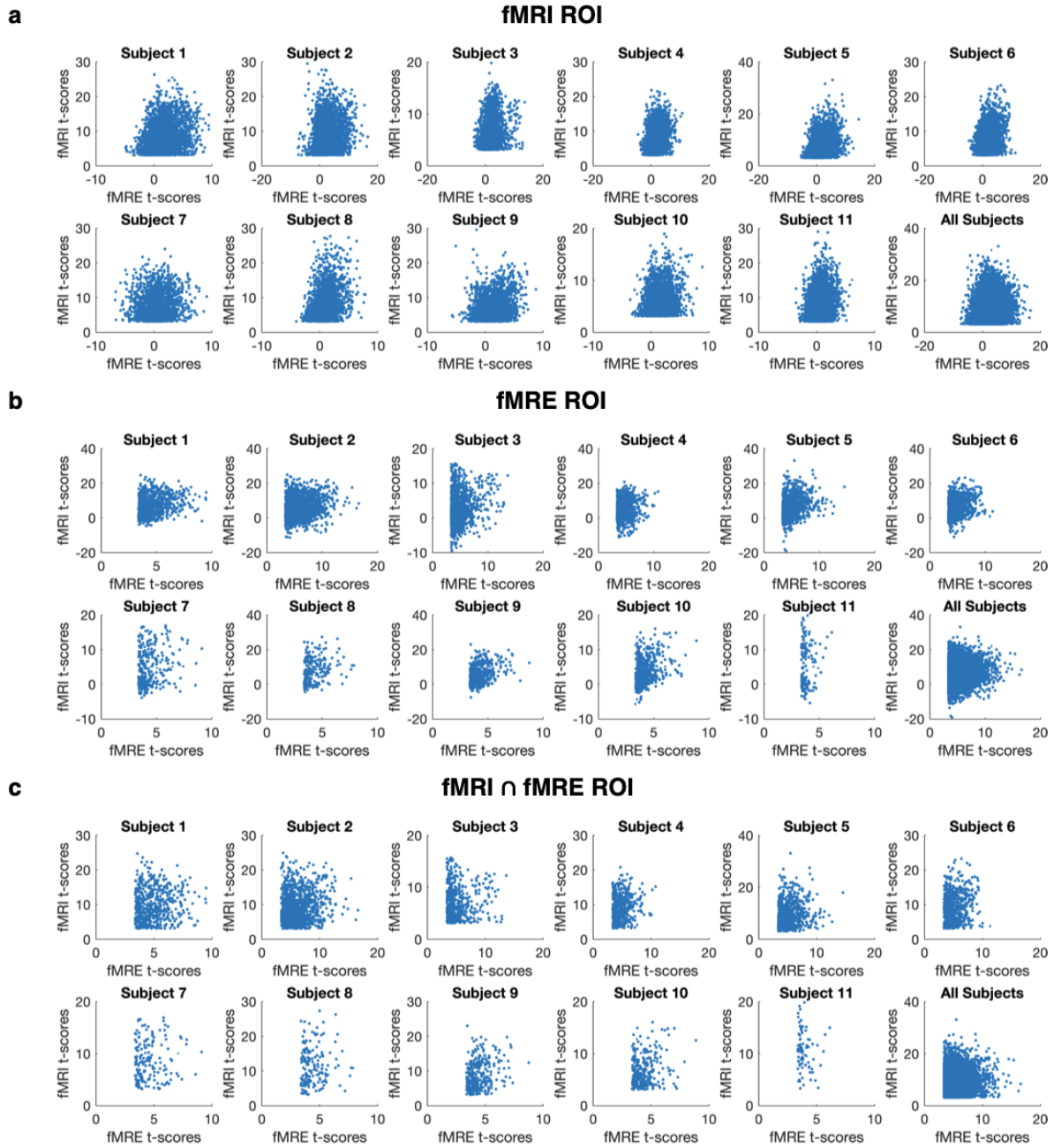


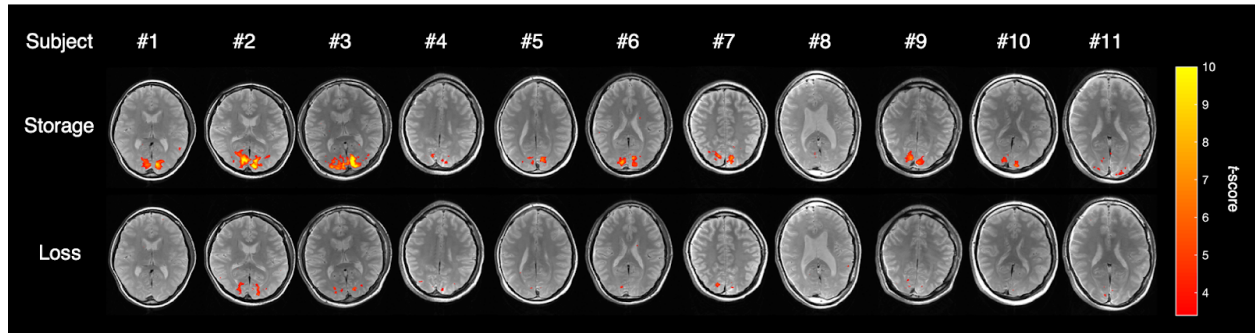
## Supplementary Material

Subject	fMRE Percent Signal Change			fMRI Percent Signal Change		
	BD 18s	BD 24s	BD 36s	BD 18s	BD 24s	BD 36s
1	6.6	7.4	7.8	1.2	1.3	1.4
2	6.3	8.5	7.5	1.3	1.4	1.5
3	5.9	6.3	6.9	1.5	1.7	1.9
4	6.6	7.8	7.3	1.4	1.4	1.5
5	6.2	7.5	8.3	1.1	1.2	2.0
6	6.7	8.2	7.3	1.5	1.5	1.7
7	5.5	6.4	6.2	1.3	1.4	1.3
8	6.7	6.7	8.0	1.5	1.5	1.7
9	7.8	9.1	9.3	1.5	1.4	1.5
10	7.2	8.5	8.9	1.2	1.2	1.4
11	8.7	11.4	10.4	1.5	1.5	1.4
Average	7.57 ± 1.31			1.44 ± 0.19		
Effect Size	5.78			7.58		

**Table S1:** Percent signal change for fMRE and fMRI. The percent signal change was averaged across activated voxels for each run.



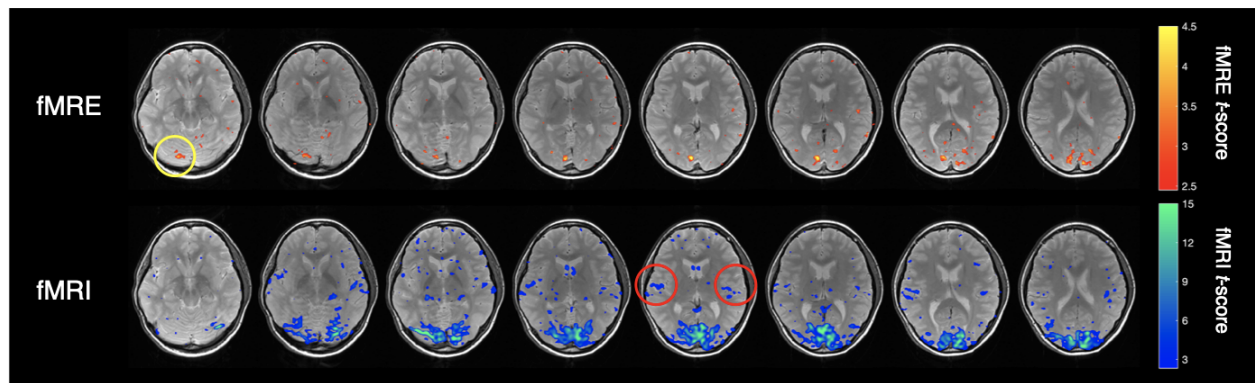
**Figure S1.** Scatter plots for fMRI t-scores vs fMRI t-scores ( $p < 0.001$ ), using voxels that are activated in fMRI (a), in fMRI (b), and in both fMRI and fMRI (c).



**Figure S2.** fMRI activation ( $p < 0.001$ ) using the storage modulus time series vs the loss modulus time series for all 11 subjects. Most stiffness changes occur in the storage modulus.

Subject	1	2	3	4	5	6	7	8	9	10	11
$G'$ (kPa)	2.06	1.99	1.96	1.98	1.85	1.96	1.88	1.95	1.83	2.08	1.66
$G''$ (kPa)	0.20	0.22	0.07	0.34	0.35	0.08	0.14	0.16	0.26	0.18	0.41
$ G^* $ (kPa)	2.26	2.20	2.17	2.18	2.05	2.16	2.05	2.13	2.00	2.31	1.88

**Table S2.** Storage modulus ( $G'$ ), loss modulus ( $G''$ ), and stiffness ( $|G^*|$ ) in the ROI defined by the fMRI activation ( $p < 0.001$ ). The storage modulus is significantly larger than the loss modulus for each subject.



**Figure S3.** fMRI and fMRE activation ( $p < 0.01$ ) for a subject undergoing a sensory-motor task, with a flashing checkerboard at 4 Hz, plungers for passive finger tapping, and atonal sounds at 3 Hz. No significant fMRE activation was detected in the auditory cortex, even though BOLD activation was present (red circles). Weak fMRE activation was observed in the cerebellum (yellow circle).