SUPPLEMENTARY MATERIAL

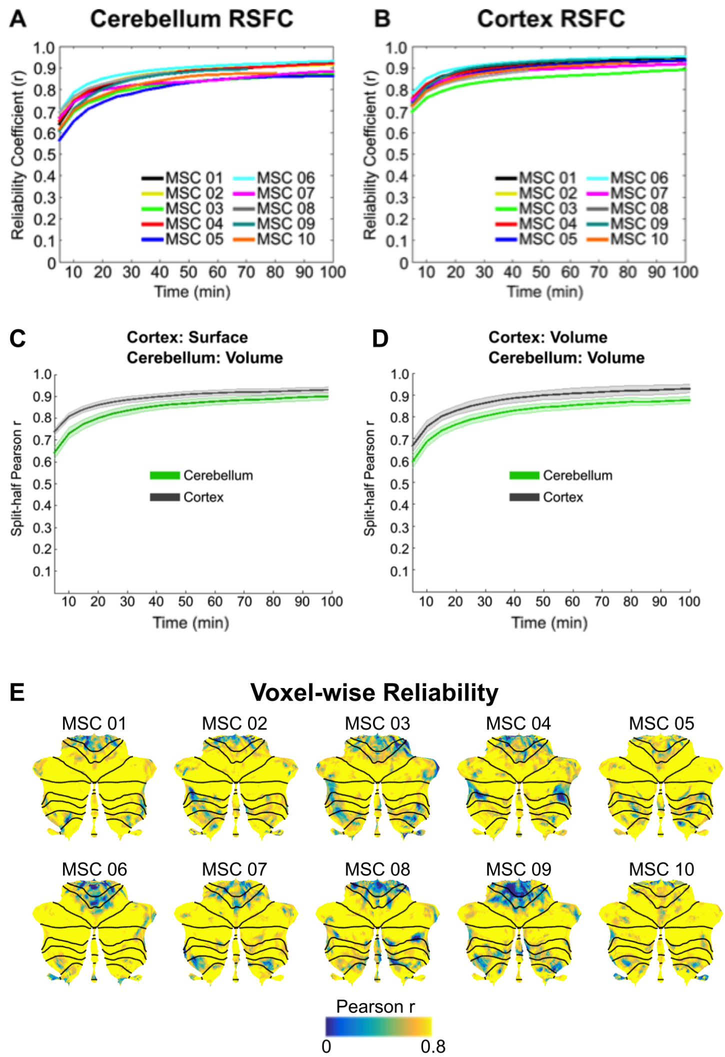

Figure S1. Reliable cerebellar RSFC estimation requires large quantities of data, Related to Figure 1. The split-half reliability of individual subject RSFC in the **(A)** cerebellum and **(B)** cortex increase with larger quantities of data. A given quantity of post motion-censored data (test set) was randomly selected and compared to an independent comparison set of data from the same subject, repeated 1,000 times for each time interval. **(C)** Average reliability across subjects for the cerebellum (voxels) and cortex (vertices), demonstrating relatively larger quantities of RSFC data are needed in the cerebellum to achieve similar reliability to the cortex. **(D)** Average reliability across subjects for the cerebellum (voxels) and cortex (voxels). Note the similarity in panels **C** and **D**, supporting the notion that reliability does not change if vertices vs. voxels are used to measure the cortex. Shaded bars in **C** and **D** denote standard error of the mean across subjects. **(E)** Voxel-wise split-half reliability of cerebellar RSFC represented on a flat map.

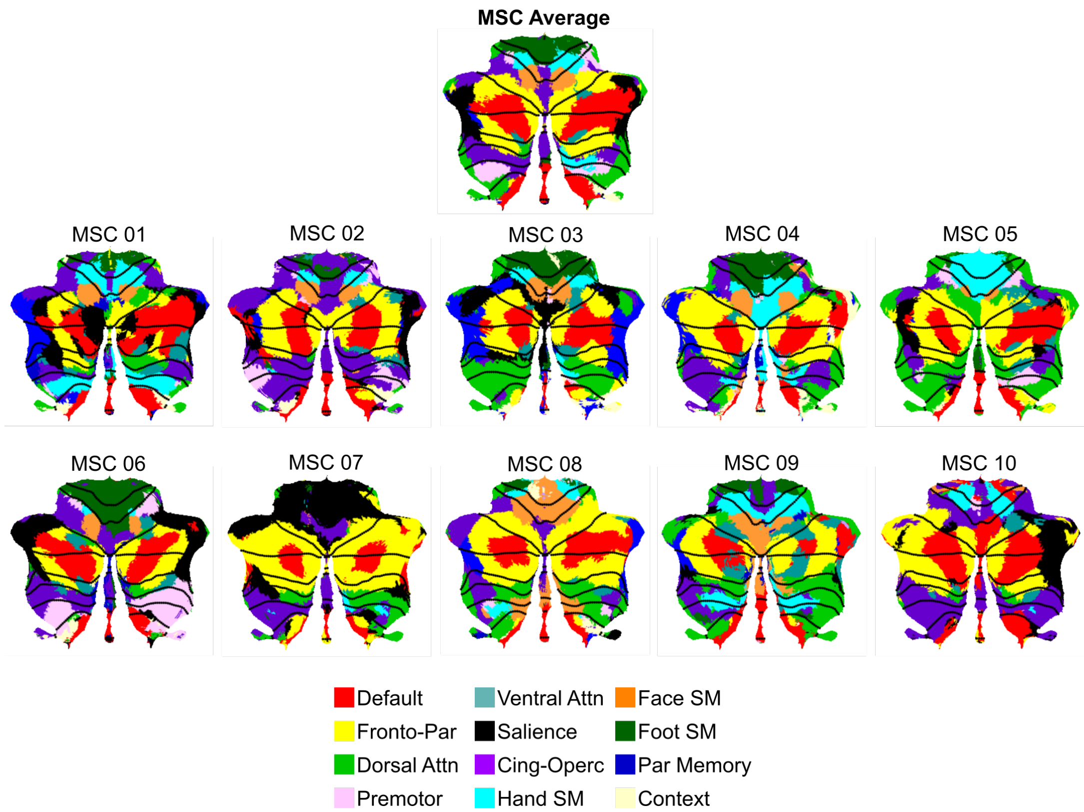

Figure S2. Flat map representations of winner-take-all assignments in the MSC average and individual subjects, Related to Figure 1. MSC average and individual MSC winner-take-all network partitions. Qualitatively, considerable variance exists between MSC subjects and between each subject and the group average. Anatomical coordinates are the same for each MSC subject as in the MSC Average.

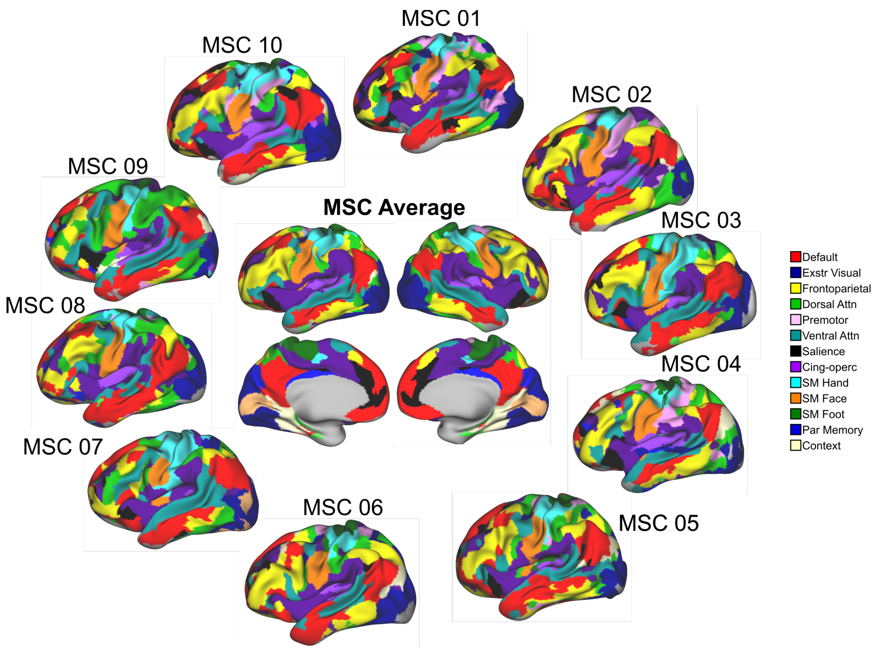

Figure S3. Cortical resting state networks from highly-sampled MSC subjects, Related to Figure 1. Outer ring: Left lateral view of individual functional brain networks. Middle panel: MSC average left and right (lateral and medial) view of functional brain networks. Individuals demonstrate measurable network pieces that deviate from the group average.

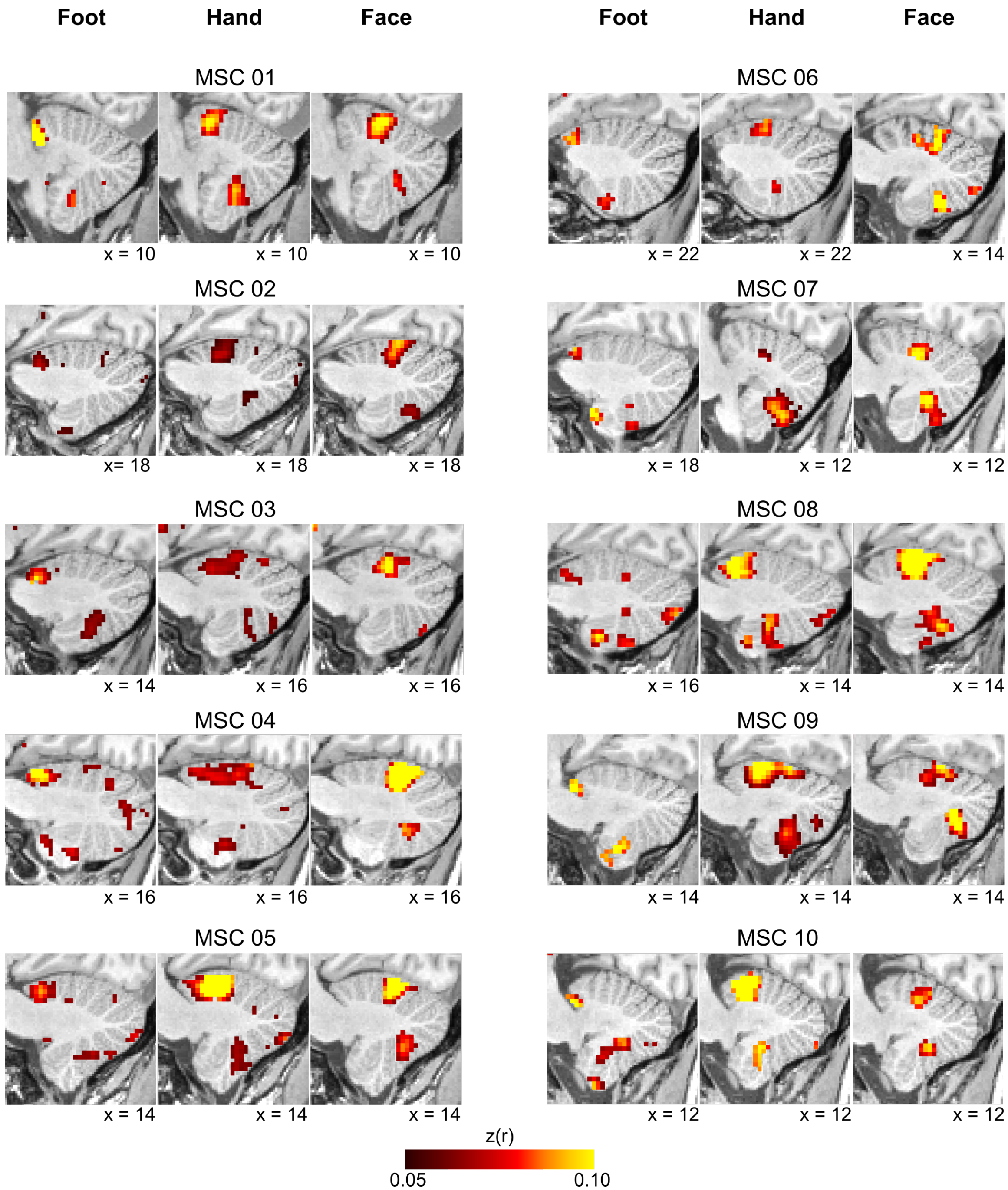

Figure S4. Cerebellar seed maps of primary motor networks, Related to Figures 2 and 3. For each subject and each motor network (foot, hand, face), we created seeded correlations from the cortical vertex demonstrating the greatest task-evoked response to all cerebellar voxels. Within each subject, we observed both an anterior and posterior representation of each motor network, providing further evidence that the quality of our individual subject data was sufficient to realize the expected double representation of the cerebellar motor homunculus.

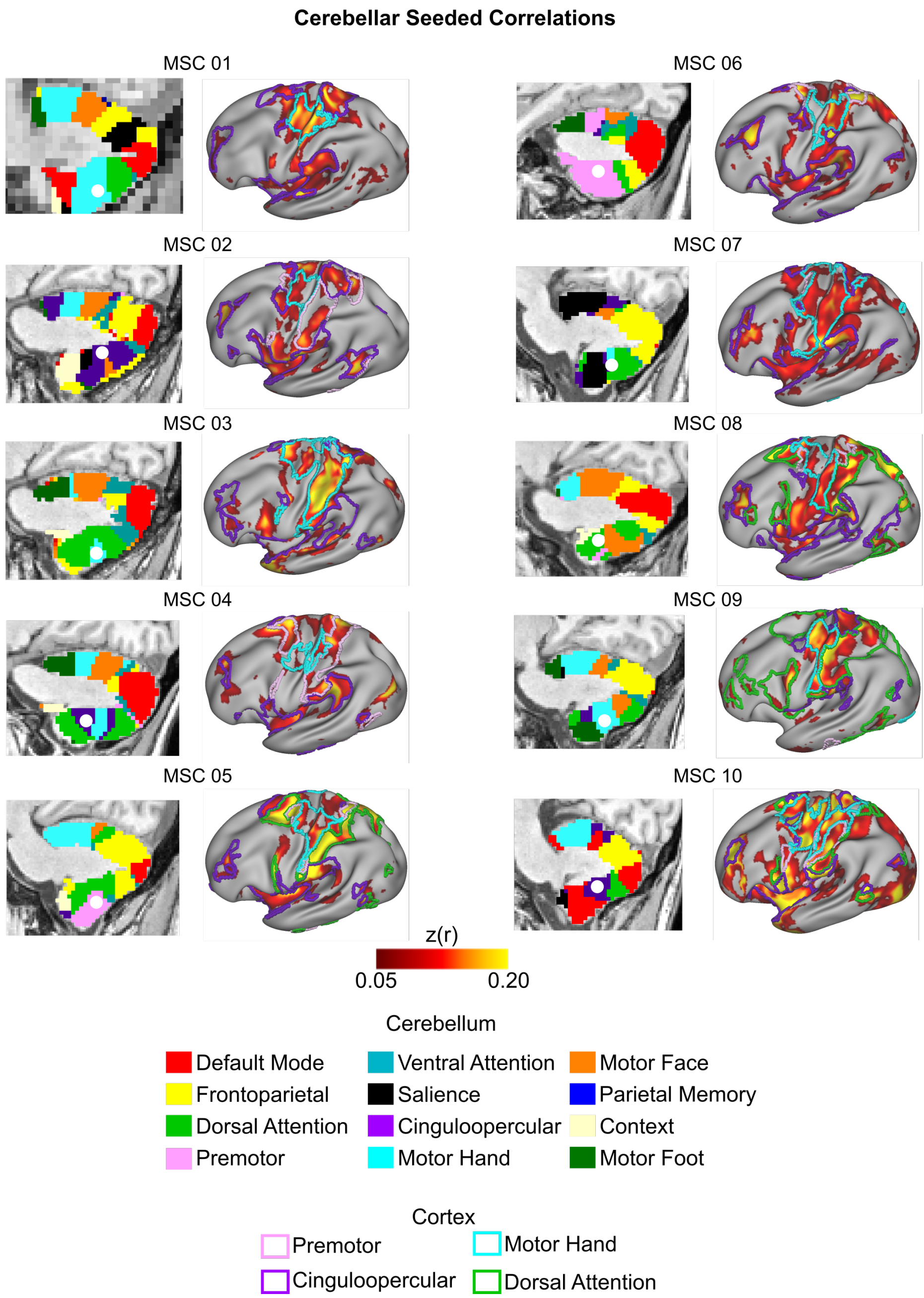

Figure S5. Cortical RSFC maps from posterior cerebellum seeds, Related to Figures 2 and 3. For each subject, we chose a seed from the posterior motor hand representation (middle column in Figure 7 within this document) and displayed RSFC between this voxel and each cortical vertex. The cortical network boundaries are displayed in colored outline on the cortical surface. Generally, these posterior seeds were highly correlated with premotor and cinguloopercular networks, in addition to the motor hand network. This raises the possibility that posterior regions of the cerebellum may play integrative role in motor control.

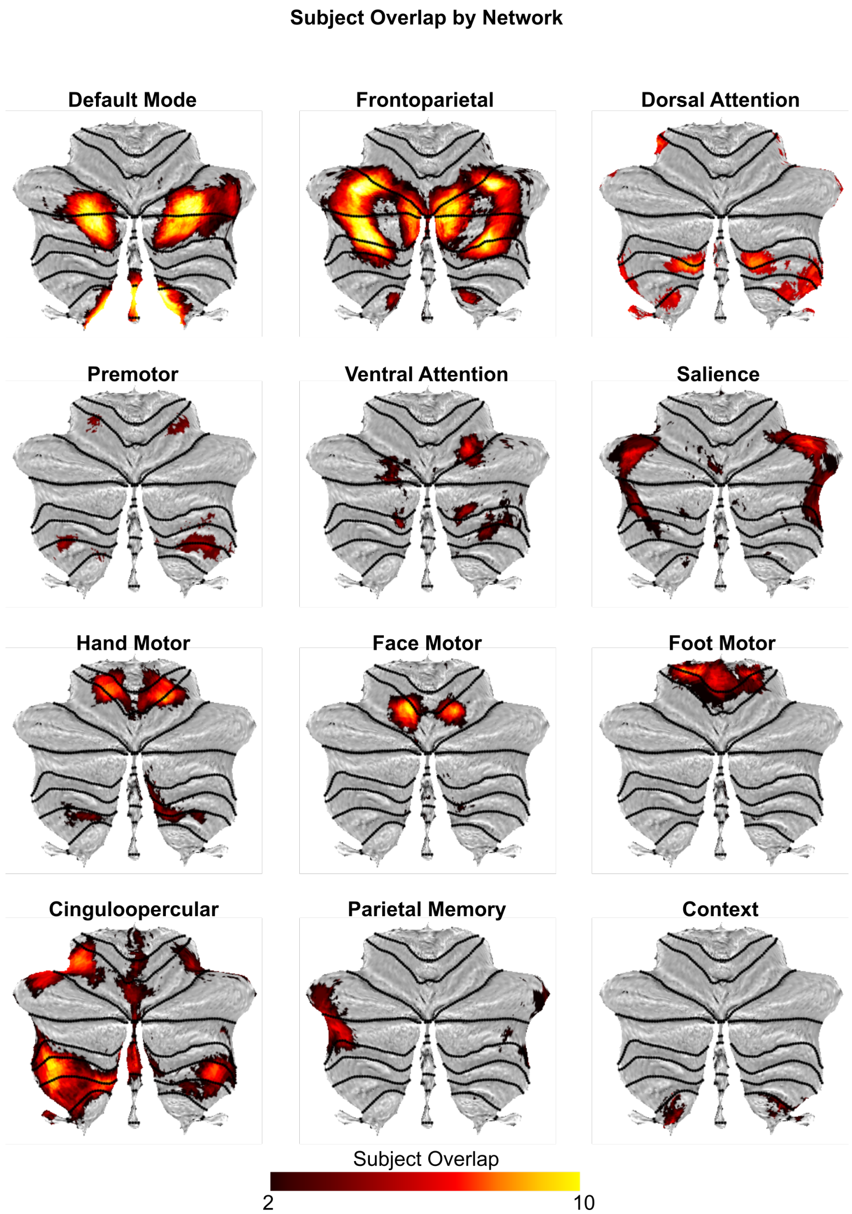

Figure S6. Subject overlap in winner-take-all assignments, zrelated to Figure 5B. For each network across the cerebellum, we quantified the number of subjects with a given network assignment. The magnitude of overlap is represented in color, where darker shades of red indicate relatively little subject overlap and yellow shades indicates relatively greater subject overlap.

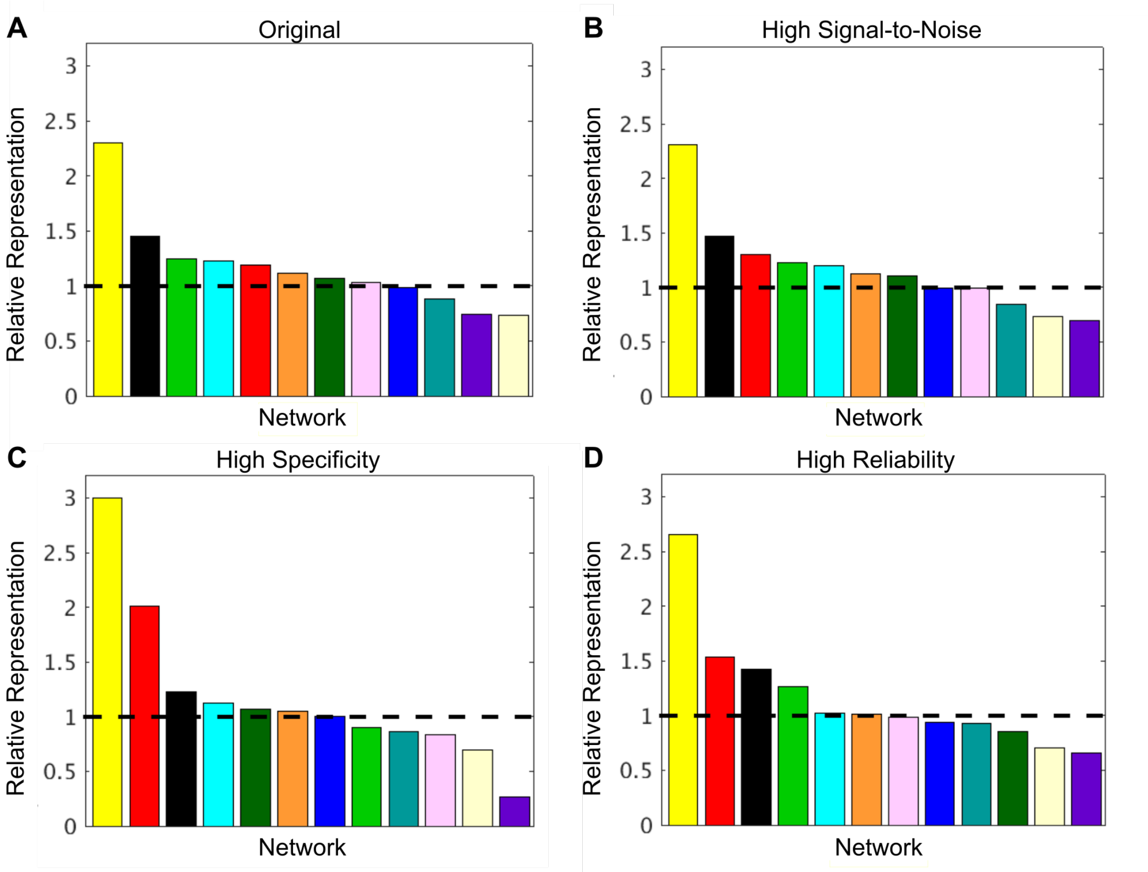

Figure S7. Frontoparietal overrepresentation estimation is robust to voxels with low tSNR, low specificity, and low split-half reliability, Related to Figure 6. **(A)** Original estimates of relative ratio (cerebellum/cortex) of network representation as in Figure 6D. Subsequent figures of the relative ratio of network representations after only including cerebellar voxels with **(B)** high tSNR (>2.5), **(C)** high specificity (>50%), and **(D)** high reliability (> 0.70). Values greater than one (horizontal dotted line) indicate greater relative space occupied by a network in the cerebellum, whereas values less than one indicate greater space occupied by a network in the cortex. In each case, the estimate of frontoparietal overrepresentation in the cerebellum compared to cortex is greater than or equal to 2.3-fold as reported in the main text.

Table S1. Difference in posterior and anterior cerebellum lags (ms) by network, Related to Figure 7.

	DMN	FPN	DAN	PM	VAN	SAL	CON	Hand	Face	ParM	CTX	Foot
MSC 01	-19.2	177.5	42.1	-	34.9	103.0	-26.2	122.4	-	78.2	20.3	178.2
MSC 02	1.3	77.9	-29.3	-10.2	74.9	53.3	15.6	-31.0	-85.0	-1.7	-54.2	73.4
MSC 03	-134.9	-15.0	-84.5	-49.2	-106.1	50.7	-217.7	-128.7	-	83.6	49.7	-117.2
MSC 04	-108.1	-45.4	-121.9	-52.5	-75.6	-236.7	-150.4	-113.5	-100.1	-203.7	-56.8	-23.2
MSC 05	-170.7	-25.2	-35.0	-3.5	-156.3	-162.2	-81.2	-	-	-119.3	-	46.1
MSC 06	-89.7	-18.5	-19.4	-6.0	-49.6	-18.2	27.1	-	-	-	-12.2	54.7
MSC 07	-162.9	31.0	-21.9	-	-61.4	-36.7	-79.7	18.0	-88.3	-	-	139.3
MSC 08	-121.5	4.1	31.4	25.2	-39.5	-5.0	122.2	37.3	89.7	100.5	136.9	85.0
MSC 09	-144.0	-23.9	49.6	-72.7	19.7	109.6	120.8	46.5	25.4	118.5	-80.2	3.3
MSC 10	-52.2	74.6	186.9	152.6	47.1	125.9	-49.5	-4.3	-	-	-	-
Avg	**-100.2**	**23.7**	**-0.2**	**-2.0**	**-31.2**	**-1.6**	**-31.9**	**-6.7**	**-31.6**	**8.0**	**0.5**	**48.9**

*Sign = posterior – anterior;
- Indicates no winner take all representation in either an anterior or posterior representation.
DMN = default mode network; FPN = frontoparietal network; DAN = dorsal attention network; PM = premotor network; VAN = ventral attention network; SAL = salience network; CON = cingulo-opercular network; Hand =hand motor network; Face = face motor network; ParM = parietal memory network; CTX = context network; Foot = foot motor network.