Appendix 2 to Qu J-F, Liu X-W, Wang M-Z, et al. Structural-informed functional MRI analysis of patients with empathy impairment following stroke. *J Psychiatry Neurosci* 2024.

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Supplemental table 1. Acquisition parameters of multimodal MRI

Sequence	Basic	TR/TE	FOV	Slice thickness	Gap	Matrix	b-value	Others
3D-T1WI	TSE	2300/2.27	250×250	1	0.5	256×256	-	-
T2WI	TSE	6610/96	230×208	3	0.9	448×313	-	-
DWI	EPI	5000/78	230×230	5	1.5	256×256	1000	-
DTI	EPI	9100/100	245×245	2	0.6	224×224	1000	Thirty diffusion gradient directions
rs-fMRI	EPI	2800/30	220×220	3.2	0.8	64 × 64	-	In-plane resolution= 3.4×3.4×3.2mm

Note: MRI:magnetic resonance imaging; DWI: diffusion weight imaging; DTI: diffusion tensor imaging; rs-fMRI: resting-state functional magnetic resonance imaging; TSE: fast spin echo; EPI: echo planar Imaging; TR: repetition time, millisecond (ms); TE: echo time, ms; FOV: field of view, millimeter^2 (mm^2);Slice thickness: mm, Gap: mm.

Supplemental table 2. The univariate analysis of structural connectivity[a] between stroke patients and healthy control.

Brain structure	MD					FA				
	Stroke		Healthy control			Stroke		Healthy control		
	Mean	SD	Mean	SD	*P*	Mean	SD	Mean	SD	*P*
MCP	0.74	0.05	0.71	0.04	**0.018**	0.57	0.03	0.58	0.02	0.054
PCT	0.78	0.12	0.76	0.10	0.430	0.50	0.07	0.52	0.05	0.118
GCC	0.84	0.09	0.76	0.04	**0.000**	0.59	0.05	0.64	0.02	**0.000**
BCC	0.98	0.26	0.84	0.08	**0.016**	0.58	0.09	0.65	0.05	**0.001**
SCC	0.97	0.27	0.84	0.06	**0.034**	0.64	0.10	0.69	0.03	**0.039**
FX	1.65	0.34	1.50	0.33	0.077	0.46	0.10	0.51	0.09	**0.018**
CST-R	0.76	0.07	0.74	0.08	0.282	0.57	0.06	0.59	0.05	0.120
CST-L	0.77	0.09	0.74	0.07	0.166	0.57	0.07	0.60	0.04	0.113
ML-R	0.77	0.08	0.74	0.04	0.136	0.61	0.07	0.63	0.03	0.261
ML-L	0.77	0.09	0.74	0.04	0.151	0.61	0.07	0.62	0.03	0.561
ICP-R	0.76	0.07	0.73	0.02	**0.027**	0.57	0.05	0.59	0.02	0.068
ICP-L	0.78	0.11	0.73	0.02	**0.035**	0.57	0.06	0.59	0.02	0.074
SCP-R	0.96	0.10	0.93	0.08	0.175	0.68	0.06	0.68	0.03	0.698
SCP-L	0.96	0.09	0.92	0.08	0.054	0.68	0.07	0.69	0.02	0.300
CP-R	0.81	0.14	0.73	0.06	**0.012**	0.65	0.05	0.67	0.03	0.054

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CP-L	0.81	0.19	0.73	0.06	**0.047**	0.65	0.07	0.68	0.02	**0.045**
ALIC-R	0.77	0.07	0.71	0.07	**0.001**	0.54	0.05	0.58	0.03	**0.000**
ALIC-L	0.78	0.10	0.71	0.07	**0.002**	0.51	0.06	0.55	0.04	**0.001**
PLIC-R	0.72	0.04	0.68	0.03	**0.000**	0.65	0.04	0.67	0.02	**0.026**
PLIC-L	0.72	0.05	0.70	0.04	0.063	0.65	0.04	0.67	0.02	0.077
RLIC-R	0.83	0.18	0.74	0.03	**0.034**	0.59	0.06	0.62	0.03	0.055
RLIC-L	0.80	0.11	0.75	0.03	**0.031**	0.61	0.06	0.64	0.02	**0.044**
ACR-R	0.82	0.10	0.75	0.09	**0.009**	0.42	0.05	0.47	0.04	**0.000**
ACR-L	0.82	0.11	0.75	0.10	**0.009**	0.41	0.05	0.45	0.04	**0.000**
SCR-R	0.80	0.15	0.70	0.08	**0.007**	0.48	0.05	0.52	0.04	**0.002**
SCR-L	0.81	0.16	0.73	0.12	**0.042**	0.48	0.05	0.51	0.05	**0.018**
PCR-R	0.90	0.19	0.81	0.12	**0.047**	0.46	0.05	0.49	0.04	0.052
PCR-L	0.91	0.24	0.80	0.13	0.070	0.45	0.06	0.48	0.05	**0.036**
PTR-R	0.88	0.16	0.82	0.05	0.078	0.57	0.07	0.60	0.04	0.053
PTR-L	0.90	0.16	0.83	0.05	0.063	0.58	0.06	0.60	0.04	**0.039**
SS-R	0.89	0.25	0.81	0.04	0.164	0.54	0.07	0.58	0.03	0.055
SS-L	0.88	0.13	0.84	0.05	0.156	0.55	0.05	0.57	0.03	0.092
EC-R	0.80	0.08	0.75	0.05	**0.007**	0.45	0.04	0.47	0.03	**0.009**
EC-L	0.81	0.09	0.76	0.07	**0.015**	0.45	0.05	0.48	0.04	**0.011**
CGC-R	0.77	0.18	0.72	0.04	0.216	0.49	0.05	0.53	0.03	**0.002**
CGC-L	0.79	0.22	0.73	0.03	0.219	0.50	0.06	0.54	0.03	**0.005**
CGH-R	0.81	0.13	0.76	0.04	0.072	0.48	0.05	0.51	0.04	**0.018**
CGH-L	0.84	0.18	0.77	0.03	0.081	0.48	0.04	0.51	0.04	**0.005**
FX/ST-R	1.06	0.20	0.93	0.08	**0.005**	0.51	0.06	0.56	0.04	**0.001**
FX/ST-L	0.87	0.10	0.81	0.05	**0.013**	0.55	0.05	0.58	0.04	**0.006**
SLF-R	0.76	0.07	0.70	0.04	**0.000**	0.49	0.05	0.53	0.03	**0.008**
SLF-L	0.76	0.10	0.70	0.04	**0.011**	0.48	0.06	0.52	0.03	**0.008**
SFO-R	0.84	0.18	0.73	0.10	**0.006**	0.45	0.08	0.52	0.04	**0.000**
SFO-L	0.89	0.17	0.77	0.14	**0.004**	0.42	0.07	0.48	0.05	**0.000**
IFO-R	0.80	0.05	0.77	0.04	**0.019**	0.54	0.04	0.57	0.03	**0.001**
IFO-L	0.80	0.06	0.77	0.04	**0.006**	0.51	0.05	0.54	0.03	**0.007**

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UNC-R	0.77	0.04	0.76	0.04	0.258	0.53	0.05	0.54	0.04	0.334
UNC-L	0.78	0.11	0.75	0.04	0.261	0.52	0.06	0.54	0.04	0.260
TAP-R	1.74	0.32	1.45	0.23	**0.000**	0.41	0.09	0.50	0.07	**0.000**
TAP-L	1.93	0.33	1.66	0.26	**0.001**	0.37	0.08	0.45	0.08	**0.000**

Note: [a] Mean (SD), ANOVA. MD: mean diffusivity, L: left, R: right, MCP: middle cerebellar peduncle, PCT: pontine crossing tract (part of the MCP); GCC: genu of the corpus callosum, BCC: body of the corpus callosum, SCC: splenium of the corpus callosum, FX: fornix, CST: corticospinal tract, ML: medial lemniscus, ICP: inferior cerebellar peduncle, SCP: superior cerebellar peduncle, CP: cerebral peduncle, ALIC: anterior limb of the internal capsule, PLIC: posterior limb of the internal capsule, RLIC: retrolenticular part of internal capsule, ACR: anterior corona radiata, SCR: superior corona radiata, PCR: posterior corona radiata, PTR: posterior thalamic radiation (including optic radiation), SS: sagittal stratum (including inferior longitidinal fasciculus and inferior fronto-occipital fasciculus), EC: external capsule, CGC: cingulum (cingulate gyrus), CGH: cingulum (hippocampus), FX/ST: fornix (cres) / stria terminalis (can not be resolved with current resolution), SLF: superior longitudinal fasciculus, SFO: superior fronto-occipital fasciculus (could be a part of the anterior internal capsule), IFO: inferior fronto-occipital fasciculus, UNC: uncinate fasciculus, TAP: tapetum.

Supplemental table 3. The collinearity between the putative risk factors following the correlation analysis.

Variable 1	Varibale 2	r	*P*
L-occipital atrophy	R-cigulate	0.446	.000
L-temporal atrohpy	FX-FA	-0.425	.000
BCC-FA	R-TAP--FA	0.612	.000
FX-FA	FX-MD	-0.929	.000
L-SFO-FA	R-TAP--FA	0.504	.000
L-UNC-FA	BBC-FA	0.408	.000
R-TAP-MD	L-TAP-MD	0.8	.000
R-TAP-MD	BBC-FA	-0.445	.000

Note: L: left, R: right, FA: fractional anisotropy, MD: mean diffusivity, BCC: body of the corpus callosum,

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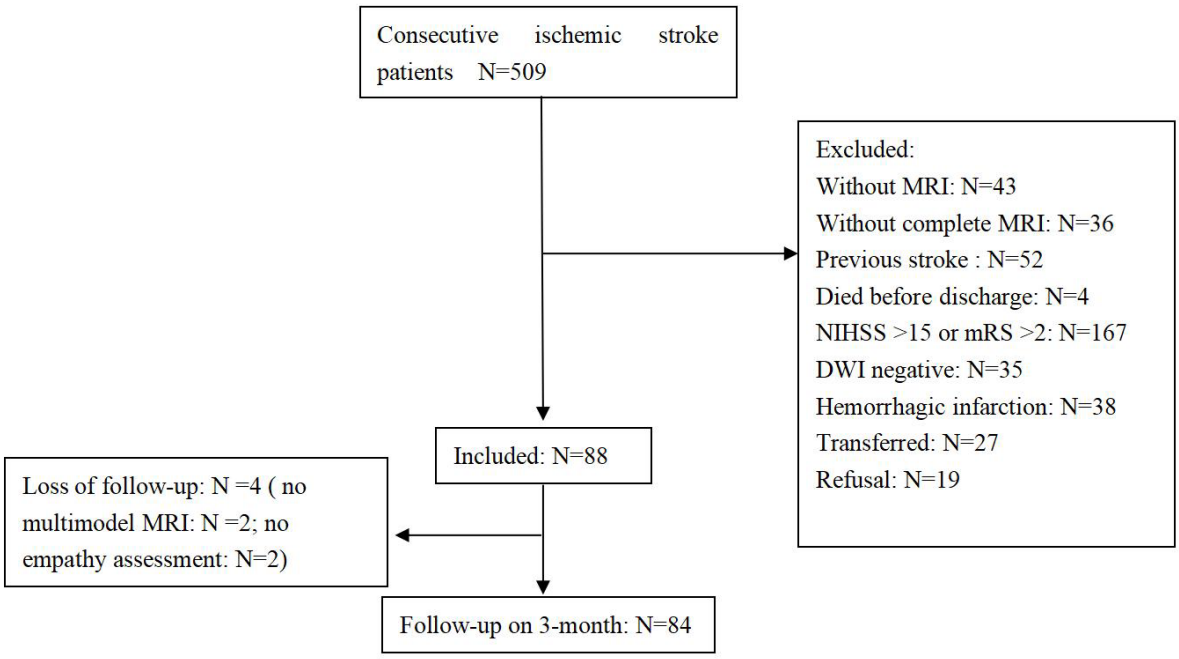
FX: fornix, SFO: superior fronto-occipital fasciculus, UNC: uncinate fasciculus, TAP: tapetum.

Figure 1 Flow-chart



Supplemental figure 1. Flowchart of the study.

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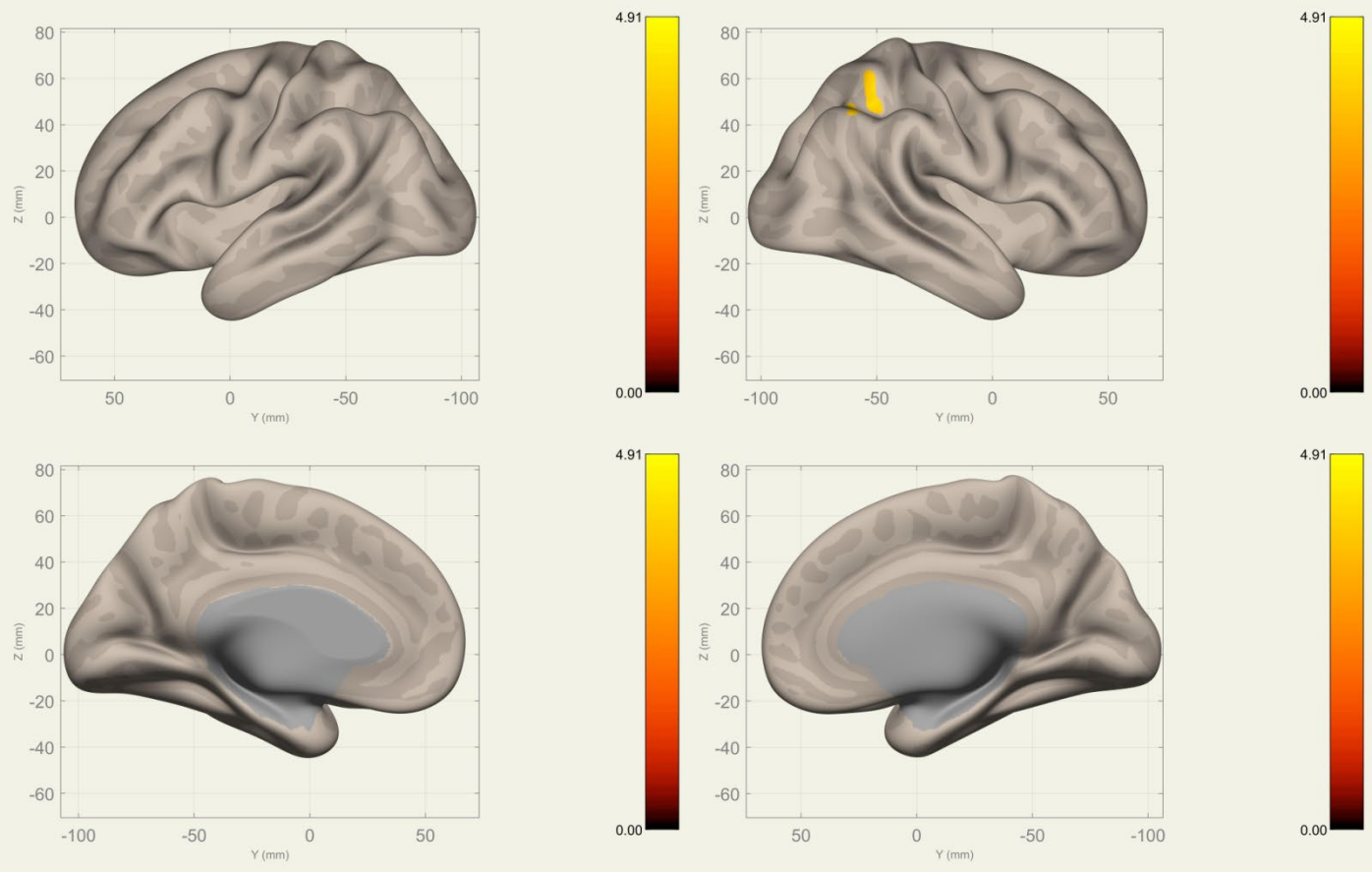

Supplemental figure 2. Seed-to-voxel analysis between low empathy *vs.* high empathy. Cluster +36 -50 +44, 136 voxels (69%) covering 9% of atlas right superior parietal lobule, indicated that the functional connectivity between anterior division of cingulate gyrus and right superior parietal lobule was relatively increased.

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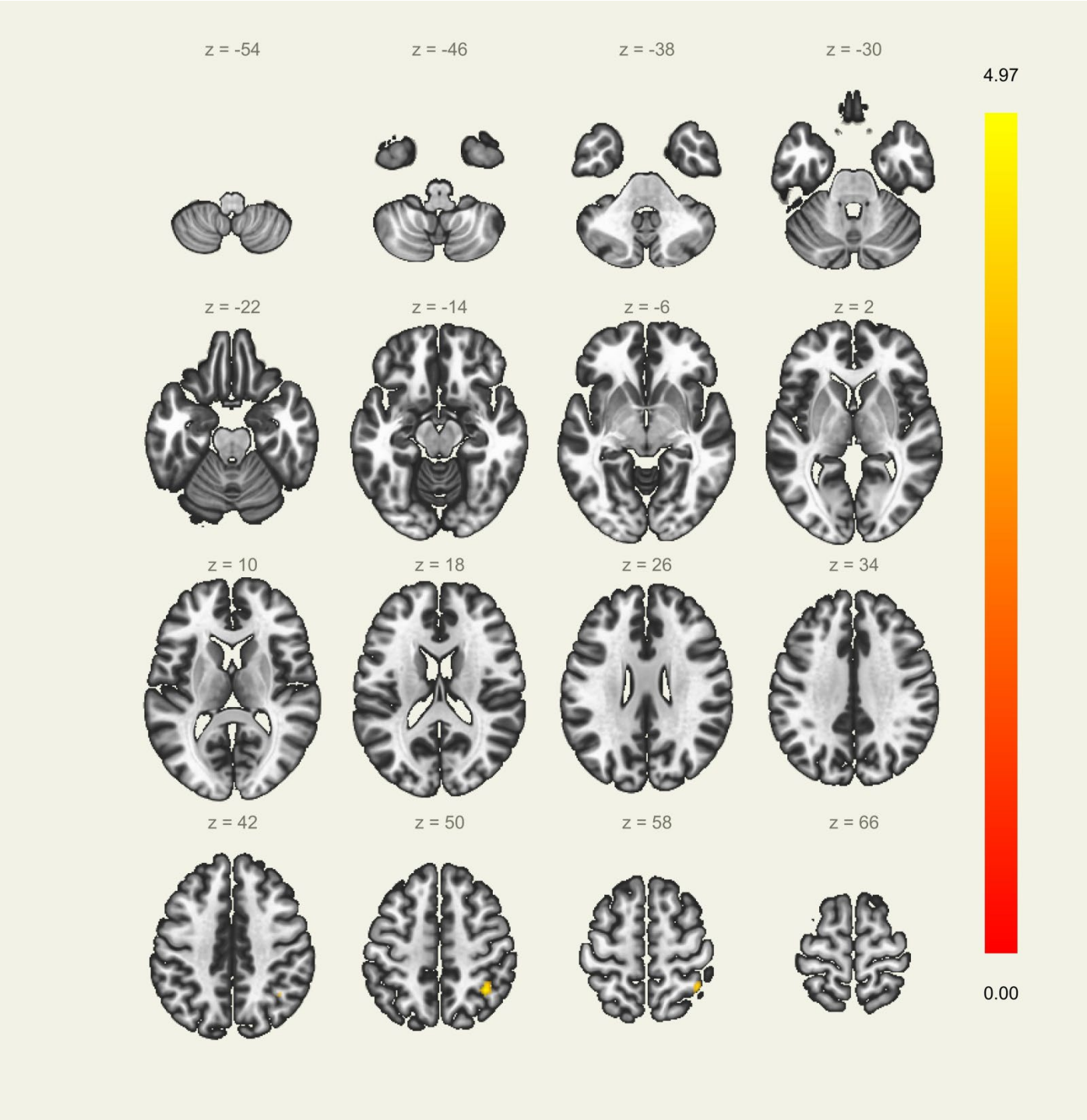

Supplemental figure 3. Seed-to-voxel analysis between low empathy *vs.* Healthy control. Cluster +38 -48 +54 , 119 voxels (88%) covering 8% of atlas right superior parietal lobule, and 16 voxels (12%) covering 1% of atlas right angular gyrus. What indicated that the functional connectivity between anterior division of cingulate gyrus and right superior parietal lobule was relatively increased.

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