

Online supplement DS1

Construction of Region of Interest Masks

Region of interest masks were constructed using a data-driven combination of information from Talairach stereotactic definitions and anatomical gray matter probabilities in order to increase the likelihood that ROI boundaries mapped onto actual brain anatomy. In brief, 43 high-resolution T1-weighted images (172 sagittally acquired spoiled gradient recalled 1mm thick slices, inversion time (TI) = 450 msec, TR = 8 msec, TE = 4 msec, flip angle = 12 degrees, FOV = 250 x 250 mm) were acquired from healthy adult participants (not included in this study) without any existing or prior psycho/neuropathology. These anatomicals were parcellated into gray and white matter using the standard segmentation protocol from SPM5 (Statistical Parametric Mapping software; <http://www.fil.ion.ucl.ac.uk/spm>) implemented in Matlab 7.5.0 (MathWorks, Natick, Massachusetts). Individual gray matter maps were then normalized to Talairach stereotactic space and combined to produce a voxelwise gray matter probability map. Thus, each voxel contained the *a-priori* probability of assignment to gray matter as determined by the SPM5 segmentation protocol across the 43 healthy participants. This gray matter probability map was then combined with Talairach stereotactic definitions to yield 76 Talairach-defined brain regions with voxelwise gray matter probabilities. Different gray matter probability thresholds (ranging from 5-50% in increments of 5) and dialation clip level maps (in downsampling from 8.0mm³ to 64.0mm³ voxels, ranging from 5-50% in increments of 5) were then produced for each Talairach region, and the overlap of each probability/clip level map with the stereotactic atlas definition was assessed through computing sensitivity and specificity calculations. These sensitivity/specificity values were then plotted on a receiver-operator curve, and the gray matter probability/clip level which individually maximized sensitivity/specificity for each particular

Talairach region was chosen as the optimal probability/clip level for that region. The amygdala, anterior cingulate, and insula ROIs were defined using the entire anatomical region as defined by the Talairach atlas. The posterior superior temporal cortical mask was defined using the middle and superior temporal gyrus anatomical regions as defined by the Talairach atlas posterior to the anterior commissure ($y < 0$) and anterior to the junction of the inferior and middle temporal gyri in the inferolateral temporal lobe ($y > -48$). This ROI encompasses posterior temporal regions meta-analytically implicated to be responsive to biological movement and facial processing⁴³ and found to display abnormalities in socially-anxious individuals.¹³ See online Table DS1 for details of these ROIs.

Additional reference

43 Grosbras MH, Beaton S, Eickhoff SB. Brain regions involved in human movement perception: a quantitative voxel-based meta-analysis. *Hum Brain Map* 2012; **33**: 431–54.

Table DS1. Characteristics of optimized anatomical-based limbic region of interest masks

Talairach Region	GM prob.	Clip level	X	Y	Z	Volume	MSE for Sig.	Sens./Spec.
Anterior Cingulate	15%	45%	2	34	6	21,568 μ l (337 voxels)	704 μ l (11 voxels)	86%/99.6%
Right Insula	15%	45%	40	-6	8	19,264 μ l (301 voxels)	704 μ l (11 voxels)	96.2%/99.3%
Left Insula	15%	45%	-38	-6	10	19,712 μ l (308 voxels)	704 μ l (11 voxels)	96.2%/99.3%
Right Amygdala	35%	50%	24	-4	-14	1,728 μ l (27 voxels)	320 μ l (5 voxels)	100%/99.9%
Left Amygdala	35%	50%	-22	-4	-16	1,664 μ l (26 voxels)	320 μ l (5 voxels)	100%/99.9%
Left Posterior Superior Temporal Cortex	15%	50%	-54	-24	0	35,968 μ l (562 voxels)	832 μ l (13 voxels)	95%/98.9%
Right Posterior Superior Temporal Cortex	15%	50%	56	-24	0	35,392 (553 voxels)	832 μ l (13 voxels)	95%/98.9%

X, Y, and Z coordinates indicate center of mass for each ROI; GM prob. = gray matter probability threshold; MSE for Sig. = minimum spatial extent for significance at $p < 0.05$ with a 4.0mm FWHM Gaussian blur; Sens.=sensitivity; Spec.=specificity.

Table DS2. Task-Dependent Activation for Matching Faces vs. Ovals

Mask	Hem.	Region	Vol. (μ l)	X	Y	Z	Voxelwise Stats			
							Mean (sd)			
							t		p	
Mean	SD	Mean	SD							
ROI	R	Middle/Superior Temporal Gyri	3776	49	-41	8	4.60	0.96	0.0002	0.0002
ROI	L	Middle/Superior Temporal Gyri	3392	-46	-34	9	4.18	0.61	0.0003	0.0003
ROI	L	Insula (p)	2816	-38	-21	13	4.57	0.74	0.0002	0.0002
ROI	R	Amygdala	1280	23	-6	-15	5.13	0.84	0.00004	0.00009
ROI	L	Amygdala	1280	-22	-4	-15	4.98	1.21	0.0002	0.0002
ROI	L	Insula (a)	768	-32	18	6	4.62	0.86	0.0002	0.0003
ROI	R	Insula (p)	704	41	-16	12	3.85	0.43	0.0005	0.0003
WB	L/R	Tuber/Culmen/Declive/Fusiform Gyrus/Parahippocampal Gyrus/Amygdala/Thalamus/Lentiform Nucleus/Middle Temporal Gyrus/Superior Temporal Gyrus	173440	7	-61	-5	5.05	1.54	0.0002	0.0002
WB	L	Inferior/Middle Frontal Gyri (dl)	14144	-41	10	32	4.99	1.20	0.0001	0.0002
WB	L/R	Posterior Cingulate/Precuneus	7552	2	-61	32	4.54	0.83	0.0002	0.0003
WB	L	Parahippocampal Gyrus/Amygdala/Lentiform Nucleus/Clastrum/Insula	7296	-26	-1	-14	4.55	0.91	0.0002	0.0002
WB	L	Precuneus/Supramarginal Gyrus/Inferior Parietal Lobule	2176	-29	-59	39	4.57	0.96	0.0002	0.0003
WB	L	Medial/Superior Frontal Gyri (dm)	1920	-4	12	54	4.12	0.49	0.0003	0.0003
WB	L/R	Medial Frontal Gyri (am)	1344	4	52	11	-4.20	0.49	0.0002	0.0003

X, Y, and Z are the Talairach coordinates for the cluster center of mass; Voxelwise stats report mean t and p value with standard deviations; Locational descriptors in parentheses do not denote actual anatomical distinctions but are based upon the relative location of the cluster in standardized space; a=anterior; am=anteromedial; dl=dorsolateral; dm=dorsomedial; Hem=hemisphere; L=left; %SC=percent signal change; p=posterior; R=right; ROI=region of interest masks; sd=standard deviation; Vol. = volume; WB=whole-brain masks.

Table DS3. Task-Dependent Activation for Matching Fear vs. Happy

Mask	Hem.	Region	Vol. (μ l)	X	Y	Z	Voxelwise Stats			
							Mean (sd)			
							t		p	
Mean	SD	Mean	SD							
ROI	R/L	Anterior Cingulate (pg)	4992	2	42	8	-2.98	0.73	0.01	0.01
ROI	R	Insula (a)	3968	37	16	5	3.58	1.21	0.008	0.01
ROI	L	Insula (a)	2368	-34	19	6	4.07	1.37	0.007	0.01
ROI	R	Middle/Superior Temporal Gyri	1792	49	-43	8	2.95	0.61	0.01	0.01
WB	R	Inferior Frontal/Middle Frontal/Precentral Gyri (dl)	13504	42	13	33	4.61	0.99	0.0002	0.0003
WB	R	Angular Gyrus/Inferior Parietal Lobule/Precuneus	7872	32	-59	41	4.46	0.87	0.0003	0.0003
WB	L	Angular Gyrus/Inferior Parietal Lobule/Precuneus	7488	-33	-55	40	4.92	1.14	0.0001	0.0002
WB	L	Inferior Frontal/Middle Frontal/Precentral Gyri (dl)	6080	-42	5	35	4.76	0.96	0.0002	0.0002
WB	L/R	Cingulate Gyrus/Medial Frontal Gyri/Superior Frontal Gyri (dm)	4544	-1	17	50	4.40	0.72	0.0002	0.0003
WB	R	Insula (a)	3008	33	19	6	4.50	0.97	0.0003	0.0003
WB	R	Thalamus	3008	7	-15	9	4.17	0.65	0.0003	0.0004
WB	L	Insula (a)	2688	-32	20	7	4.63	0.87	0.0002	0.0003
WB	L	Middle Frontal Gyrus (dl)	1600	-45	33	18	4.01	0.45	0.0004	0.0003
WB	R	Middle/Superior Temporal Gyri	1344	47	-54	8	3.95	0.39	0.0004	0.0003

X, Y, and Z are the Talairach coordinates for the cluster center of mass; Voxelwise stats report mean t and p value with standard deviations; Locational descriptors in parentheses do not denote actual anatomical distinctions but are based upon the relative location of the cluster in standardized space; a=anterior; dl=dorsolateral; dm=dorsomedial; Hem=hemisphere; L=left; %SC=percent signal change; pg=perigenual; R=right; ROI=region of interest masks; sd=standard deviation; Vol. = volume; WB=whole-brain masks.

Table DS4. Task-Dependent Activation for Matching Angry vs. Happy

Mask	Hem.	Region	Vol. (μ l)	X	Y	Z	Voxelwise Stats			
							Mean (sd)			
							t		p	
Mean	SD	Mean	SD							
ROI	R/L	Anterior Cingulate (pg)	4416	4	44	4	-2.78	0.52	0.01	0.01
ROI	R	Middle/Superior Temporal Gyri	1792	54	-38	6	2.29	0.24	0.03	0.01
ROI	R	Insula (a)	1728	33	18	4	3.01	0.78	0.01	0.01
ROI	L	Insula (a)	1216	-33	20	5	2.95	0.60	0.01	0.01
ROI	R	Middle Frontal Gyrus/Precentral Gyrus (dl)	2368	43	3	35	4.04	0.45	0.0003	0.0003

X, Y, and Z are the Talairach coordinates for the cluster center of mass; Voxelwise stats report mean t and p value with standard deviations; Locational descriptors in parentheses do not denote actual anatomical distinctions but are based upon the relative location of the cluster in standardized space; a=anterior; dl=dorsolateral; Hem=hemisphere; L=left; %SC=percent signal change; pg=perigenual; R=right; ROI=region of interest masks; sd=standard deviation; Vol. = volume; WB=whole-brain masks.