

TABLE S1. Activations for the conjunction of rest-fixation, and self-reference greater than rest-fixation.

Brain region	Controls					MDD				
	Cluster size	Peak <i>t</i> -value	Peak co-ordinate			Cluster size	Peak <i>t</i> -value	Peak co-ordinate		
			x	y	z			x	y	z
Medial prefrontal cortex	771	8.1	2	60	10	683	8.7	0	60	10
Posterior cingulate cortex	164	9.1	-4	-50	26	110	7.8	-4	-48	28
Left inferior parietal lobule	226	7.3	-50	-66	26	97	6.2	-46	-62	28
Left middle temporal gyrus	52	6.2	-58	-16	-10	–	–	–	–	–

Only clusters of 50 or more voxels are reported.

TABLE S2. Effects of sex on parameter estimates for each group and for the groups combined.

Model parameters	Controls			MDD			Combined		
	Odds ratio	95% CI	<i>p</i> -value	Odds ratio	95% CI	<i>p</i> -value	Odds ratio	95% CI	<i>p</i> -value
Fixed									
MPFC→PCC	0.81	0.11 to 5.88	0.84	3.64	0.89 to 14.79	0.07	2.85	0.62 to 12.96	0.18
MPFC→IPL	1.25	0.14 to 11.04	0.84	4.25	0.24 to 76.33	0.33	2.32	0.42 to 12.80	0.33
PCC→MPFC	0.44	0.04 to 4.75	0.50	0.11	0.01 to 1.79	0.12	0.33	0.06 to 1.84	0.20
PCC→IPL	1.26	0.15 to 10.73	0.84	0.31	0.02 to 5.85	0.43	0.73	0.13 to 3.99	0.72
IPL→MPFC	2.68	0.28 to 25.38	0.86	0.90	0.07 to 10.73	0.93	1.60	0.31 to 8.16	0.58
IPL→PCC	0.45	0.11 to 1.95	0.29	0.56	0.10 to 3.19	0.52	0.47	0.16 to 1.42	0.18
Modulatory									
MPFC→PCC	0.86	0.52 to 1.45	0.58	1.30	0.79 to 2.13	0.30	1.00	0.72 to 1.40	0.98
MPFC→IPL	0.80	0.31 to 2.08	0.65	0.41	0.11 to 1.46	0.17	0.62	0.29 to 1.32	0.22
PCC→MPFC	0.80	0.46 to 1.37	0.42	0.59	0.19 to 1.83	0.36	0.70	0.43 to 1.14	0.15
PCC→IPL	1.02	0.66 to 1.58	0.93	1.82	0.87 to 3.78	0.11	1.15	0.80 to 1.65	0.46

MPFC = medial prefrontal cortex; PCC = posterior cingulate cortex; IPL = inferior parietal lobule. An odds ratio > 1 indicates that parameter values are greater in males compared to females, and vice versa.

TABLE S3. Associations between age and parameter estimates for each group and for the groups combined.

Model parameters	Controls			MDD			Combined		
	Correl. coeff.	95% CI	<i>p</i> -value	Correl. coeff.	95% CI	<i>p</i> -value	Correl. coeff.	95% CI	<i>p</i> -value
Fixed									
MPFC→PCC	-0.20	-0.42 to 0.02	0.07	-0.01	-0.25 to 0.23	0.97	-0.11	-0.27 to 0.05	0.20
MPFC→IPL	0.00	-0.22 to 0.22	0.99	-0.22	-0.44 to 0.02	0.08	-0.05	-0.21 to 0.11	0.57
PCC→MPFC	0.19	-0.03 to 0.39	0.09	-0.02	-0.26 to 0.22	0.85	0.10	-0.06 to 0.26	0.21
PCC→IPL	0.06	-0.16 to 0.27	0.57	0.18	-0.06 to 0.40	0.16	0.09	-0.07 to 0.25	0.28
IPL→MPFC	0.02	-0.20 to 0.24	0.86	0.07	-0.17 to 0.30	0.60	0.03	-0.13 to 0.19	0.71
IPL→PCC	0.09	-0.13 to 0.30	0.41	0.14	-0.10 to 0.37	0.27	0.07	-0.09 to 0.23	0.42
Modulatory									
MPFC→PCC	-0.08	-0.29 to 0.14	0.50	0.06	-0.18 to 0.29	0.63	-0.05	-0.21 to 0.11	0.53
MPFC→IPL	-0.04	-0.25 to 0.18	0.70	-0.04	-0.28 to 0.20	0.76	-0.04	-0.20 to 0.12	0.60
PCC→MPFC	0.15	-0.07 to 0.36	0.19	0.11	-0.13 to 0.34	0.41	0.04	-0.12 to 0.20	0.64
PCC→IPL	0.02	-0.20 to 0.24	0.81	0.09	-0.15 to 0.32	0.48	0.01	-0.15 to 0.17	0.86

MPFC = medial prefrontal cortex; PCC = posterior cingulate cortex; IPL = inferior parietal lobule.

TABLE S4. Factor loadings of the MADRS items.

MADRS item	Factor 1	Factor 2	Factor 3	Factor 4
Apparent sadness	0.86			
Reported sadness	0.75			
Inability to feel	0.48			
Reduced appetite		0.69		
Reduced sleep		0.67		
Pessimistic thoughts		0.67		
Lassitude			0.74	
Suicidal thoughts			0.68	
Concentration difficulties				0.81
Inner tension				0.47
% variance explained	17.9	16.4	14.5	13.1

TABLE S5. Associations between parameters of interest and clinical and behavioral variables.

	Correlation coefficient	95% CI	<i>p</i>-value	<i>q</i>-value
Association with MPFC–PCC connectivity:				
Total MADRS score	0.03	-0.21 to 0.27	0.79	0.79
MADRS sadness factor	-0.08	-0.31 to 0.17	0.57	0.72
MADRS somatic/pessimism factor	0.17	-0.08 to 0.39	0.21	0.61
MADRS lassitude/suicidality factor	0.10	-0.14 to 0.38	0.45	0.67
MADRS concentration/tension factor	-0.32	-0.51 to -0.08	0.01	0.04*
Proportion of personality adjectives affirmed	0.15	-0.10 to 0.38	0.27	0.61
Likeableness of personality adjectives affirmed	-0.06	-0.30 to 0.18	0.64	0.72
Association with MADRS concentration/tension factor				
Proportion of personality adjectives affirmed	0.35	0.10 to 0.54	0.008	0.04*
Likeableness of personality adjectives affirmed	-0.10	-0.34 to 0.14	0.45	0.67

q-values represent *p*-values that have been adjusted using the false discovery rate.

*significant at $q < 0.05$

TABLE S6. Comparison of participants who have depression and social anxiety disorder with participants who have depression without an anxiety disorder

	MDD without anxiety disorder		MDD with social anxiety disorder		<i>p</i> -value
	N	%	N	%	
Participants	23		24		
Females	8	34.8	16	66.7	0.03
	Mean	S.D.	Mean	S.D.	
Age, <i>y</i>	19.3	2.6	20.3	2.8	0.16
FSIQ	106.7	9.2	107.0	6.8	0.91
MADRS	34.3	4.8	32.0	4.3	0.10
Accuracy on external attention task, %	95.7	4.5	94.3	4.6	0.27
Mean reaction time for external attention task, <i>s</i>	2.1	0.4	2.0	0.4	0.44
Mean reaction time for self-appraisal task, <i>s</i>	1.8	0.3	1.6	0.3	0.08
Proportion of personality adjectives affirmed, %	56.7	10.8	55.6	11.4	0.99
Likeableness of adjectives affirmed	3.0	0.3	3.1	0.2	0.42
	Correl. coeff.	s.e.	Correl. coeff.	s.e.	
Correlation between conc./tension factor and MPFC–PCC connectivity, <i>r</i>	-0.40	0.20	-0.26	0.21	0.62

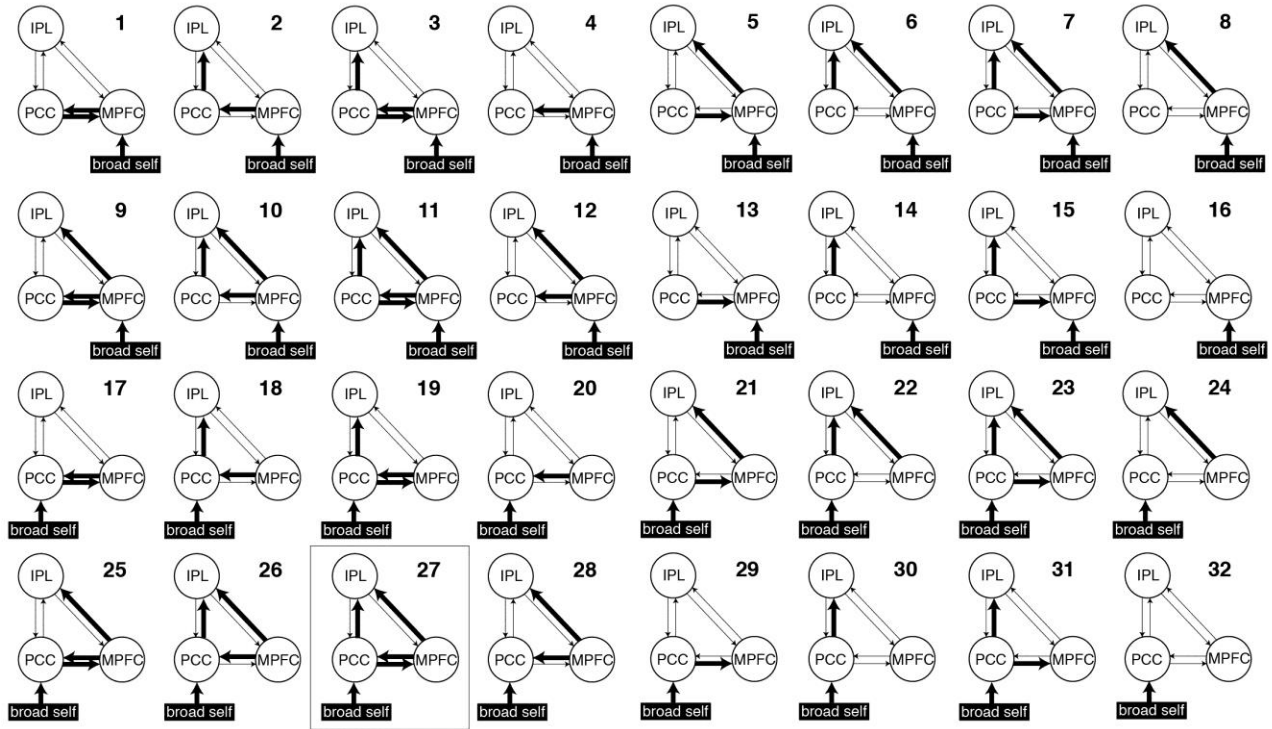


FIGURE S1. The DCM candidate model-space. Network connections between the core-self regions were elaborated in 32 models, which varied according to whether broad self (rest-fixation and self-appraisal) drove network activity via MPFC or PCC, and whether self-appraisal modulated efferent connections from MPFC to PCC, IPL, both, or neither, and/or connections from PCC to MPFC, IPL, both, or neither (i.e., a $2 \times 4 \times 4 = 32$ candidate model-space). Bayesian model selection favored model 27 in both the depressed and control groups. MPFC = medial prefrontal cortex; PCC = posterior cingulate cortex; IPL = inferior parietal lobule.

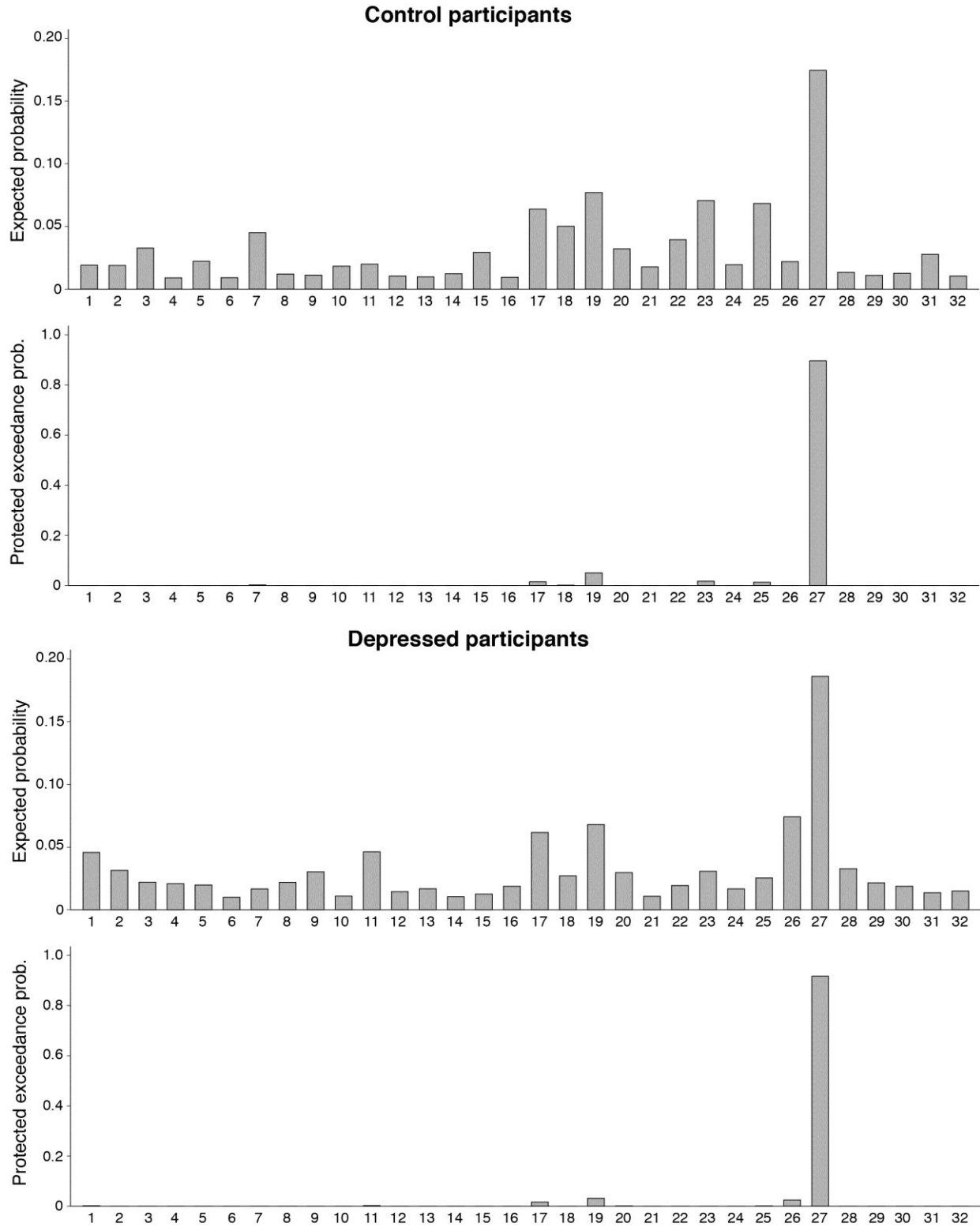


FIGURE S2. Bayesian model selection. BMS clearly favored model 27 in both the control participants (expected probability = 0.17, protected exceedance probability = 0.90) and the depressed participants (expected probability = 0.19, protected exceedance probability = 0.92).