SUPPLEMENT 1

METHOD

Image Acquisition

Whole-brain MRI scans were acquired using a standard quadrature GE 8-channel head coil and a GE Signa 3 Tesla LX scanner (Milwaukee, WI). Structural images were collected using a high-resolution T1-weighted FSPGR pulse sequence (inversion time 500 msec, echo time 2.5 msec, repetition time 6.3 msec, one excitation, matrix size 256 x 256, field of view x 25 cm, flip angle x11, number of slices 164, slice thickness 1 mm encoded for sagittal slice reconstruction, providing voxel dimensions of 1 mm isotropic).

Image Processing

Image processing, including cortical surface reconstruction and volumetric segmentation, was performed in FreeSurfer image analysis suite (version 5.3.0, http://surfer.nmr.mgh.harvard.edu/) using automated and semi-automated tools.[1, 2] Briefly, T1-weighted images were registered to Talairach space, intensity variations corrected, and non-brain tissues (i.e., skull or extra-cerebral regions) removed. Data from each participant were segmented into grey and white matter, and a triangular tessellation cover was applied to each individual scan before the image was inflated for visualization of cortical surfaces within sulci. Each scan was then transformed into a parameterizable surface to ensure accurate alignment to a reference template, and the cerebral cortex was divided into parcels based on gyri and sulci positioning.[3] CT at every point on the smoothed, aligned images was then calculated by estimating the shortest distance between the pial surface and gray/white matter boundary at each point across the cortical mantle. To extract reliable CT estimates, the images were then automatically processed with the longitudinal stream.[4] Specifically an unbiased within-subject template space and image was created using robust, inverse consistent registration, and subsequent processing steps were then initialized with common information from the within-subject template.[4]

SUPPLEMENTARY REFERENCES

1. Fischl B, Dale AM. Measuring the thickness of the human cerebral cortex from magnetic resonance images. *Proceedings of the National Academy of Sciences.* 2000;97:11050-11055.

2. Dale AM, Fischl B, Sereno MI. Cortical surface-based analysis. I. Segmentation and surface reconstruction. *Neuroimage.* 1999;9:179-194.

3. Desikan RS, Segonne F, Fischl B, et al. An automated labeling system for subdividing the human cerebral cortex on MRI scans into gyral based regions of interest. *Neuroimage.* 2006;31:968-980.

4. Reuter M, Schmansky NJ, Rosas HD, Fischl B. Within-subject template estimation for unbiased longitudinal image analysis. *Neuroimage.* 2012;61:1402-1418.

Figure S1. Data collection by age and assessment point. Note: BN = bulimia nervosa; HC = healthy control.

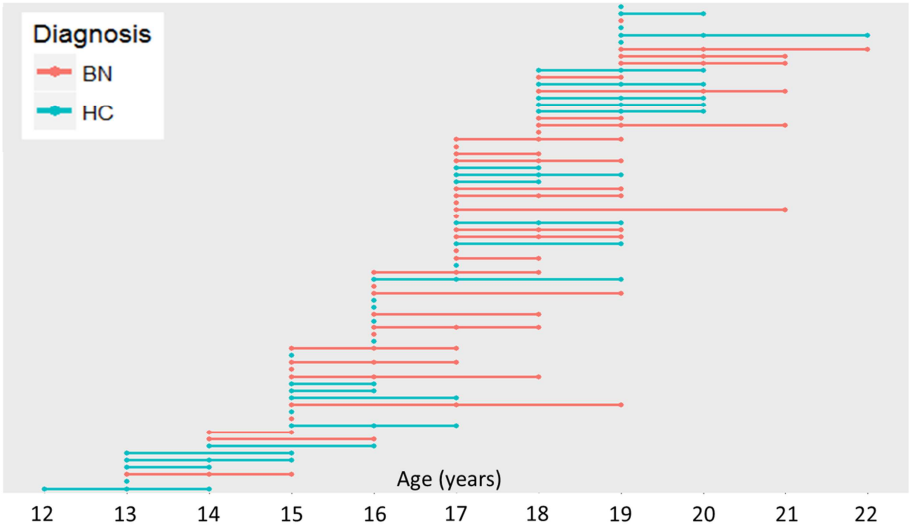

Table S1. Growth Curve Models Predicting Cortical Thickness in Healthy Controls (HC) Vs. Remitted Bulimia Nervosa (BN),[a] Adjusting for the Use of Selective Serotonin Reuptake Inhibitor (SSRIs) and Presence of Comorbid Depression or Anxiety

Cortical Area	Side	Characteristic[b]	*B*	*SE*	*t*	*p*
Inferior frontal gyrus (oper)	Right	Group	-0.11	0.05	-2.32	.02
		Time	<0.01	<0.01	-2.28	.03
		Group*Time	<0.01	<0.01	0.33	.74
		Age	-0.02	0.01	-1.30	.20
		SSRI	-0.02	0.02	-0.86	.40
		Comorbidities	-0.01	0.02	-0.39	.70
Inferior frontal gyrus (orb)	Right	Group	0.12	0.06	1.88	.07
		Time	<0.01	<0.01	2.66	.01
		Group*Time	<0.01	<0.01	0.40	.69
		Age	-0.03	0.02	-2.08	.04
		SSRI	-0.02	0.03	-0.59	.56
		Comorbidities	-0.03	0.03	-1.06	.29

Contrast comparisons of CT at 0, 12, 24, and 36 months, based on CT point slope estimates from growth curve models reported above

		0 month				12 months				24 months				36 months			
Cortical Area	**Side**	***B***[c]	***SE***	***t***	***p***	***B***[c]	***SE***	***t***	***p***	***B***[c]	***SE***	***t***	***p***	***B***[c]	***SE***	***t***	***p***
Inferior frontal gyrus (oper)	Right	-0.11	0.05	-2.32	.02	-0.11	0.05	-2.31	.02	-0.10	0.05	-2.18	.03	-0.10	0.05	-1.96	.05
Inferior frontal gyrus (orb)	Right	0.12	0.06	1.88	.07	0.12	0.06	2.08	.04	0.13	0.06	2.11	.04	0.14	0.07	2.01	.05

Note: Oper = pars opercularis; orb = pars orbitalis.
[a] Remission is defined as >50% reduction in the frequency of objective bulimic episodes and vomiting episodes between baseline and last assessment.
[b] Group coded as HC=0, BN=1; Time coded as months from baseline; Age coded as years at baseline; SSRI coded as Not taking SSRI = 0, Taking SSRI = 1; Comorbidities coded as Absence = 0, Presence = 1.
[c] *B* estimates represent group difference in CT, where group was coded as HC = 0 and BN = 1.

Table S2. Multilevel Models of Cortical Thickness (CT) Predicting Bulimia Nervosa (BN) Symptoms[a], Adjusting for the Use of Selective Serotonin Reuptake Inhibitors and Presence of Comorbid Depression or Anxiety

			Between-subject[b]			
BN symptom	**Cortical Area**	**Side**	***B***	***SE***	***t***	***p***
OBEs	Frontal pole	Left	-2.69	1.06	-2.5	.02
Vomiting episodes	Lateral orbitofrontal	Right	-3.95	1.96	-2.01	.06
	Inferior frontal gyrus (orb)	Right	-3.41	1.22	-2.80	.01

Note: OBE = objective binge-eating episodes; Orb = pars orbitalis.
[a] BN symptoms were the frequency of binge-eating and vomiting episodes over the past 28 days prior to scanning.
[b] Average CT over time is used as the between-subject predictor.
[c] Deviation at each time point from each participant's own average CT over time is used as the within-subject predictor.

Table S3. Baseline Demographic and Clinical Characteristics Across Bulimia Nervosa (BN) Subtypes

	BN (n = 21)	OSFED-BN (n = 12)	Analysis	
Characteristic	***Mean(SD)***	***Mean(SD)***	***t(df)***	***p***
Age (years)	17.0(1.3)	15.8(1.5)	2.52(31)	.017
Body mass index (kg/m^2)	22.3(3.2)	21.7(1.4)	-0.65(31)	.518
Duration of illness (months)	29.9(20.6)	16.2(19.4)	-1.91(31)	.070
WAIS IQ score (Full)	108.4(10.6)	105.9(12.5)	0.58(31)	.567
Eating Disorders Examination ratings				
Objective bulimic episodes (past 28 days)	21.5(18.7)	0.9(1.7)	-5.01(31)	<.001
Subjective bulimic episodes (past 28 days)	17.3(26.9)	20.2(20.1)	-0.37(31)	.731
Vomiting episodes (past 28 days)	34.6(26.2)	30.3(33.5)	-0.38(31)	.712
Loss of control (past 28 days)	38.7(31.7)	21.1(20.2)	-1.95(31)	.063
Prior AN (%)	14.2	9.0		
Comorbid MDD (%)	42.9	41.7		
Comorbid Anxiety (%)	9.5	41.7		
SSRIs use (%)	23.8	33.3		
Treatment				
Inpatient (%)	38.1	33.3		
Outpatient (%)	28.6	25.0		

Note: AN = anorexia nervosa; MDD = major depressive disorder; OSFED = other specified feeding or eating disorder; SSRI = selective serotonin reuptake inhibitor; WAIS = Weschler Adult Intelligence Scale.

Table S4. Time Intervals (in Months) Between Assessments Across Groups

	BN	HC	Analysis	
Time Interval	***Mean (SD)***	***Mean (SD)***	***t***	***p***
FU1-Baseline	17.01 (7.47)	13.97 (3.58)	-1.71	.09
FU2-FU1	15.03 (3.99)	14.50 (2.11)	-0.42	.68
FU2-Baseline	29.41 (6.69)	26.87 (2.16)	-1.26	.22

Note: BN = bulimia nervosa; FU = follow-up; HC = healthy control.

Table S5. Test-Retest Pearson Correlations of Cortical Thickness (CT) Between Assessments Within Groups

BN Group		**Baseline & FU1**		**FU1 & FU2**		**Baseline & FU2**	
Cortical Area	**Side**	***r***	***p***	***r***	***p***	***r***	***p***
Inferior fronal gyrus (oper)	Left	0.80	<.01	0.82	<.01	0.74	<.01
	Right	0.95	<.01	0.92	<.01	0.89	<.01
Inferior fronal gyrus (orb)	Left	0.84	<.01	0.63	.01	0.74	<.01
	Right	0.89	<.01	0.91	<.01	0.90	<.01
Inferior fronal gyrus (tri)	Left	0.83	<.01	0.75	<.01	0.75	<.01
	Right	0.75	<.01	0.80	<.01	0.74	<.01
Lateral orbitofrontal	Left	0.61	<.01	0.43	.10	0.38	.15
	Right	0.53	.01	0.53	.03	0.51	.04
Medial orbitofrontal	Left	0.51	.01	0.37	.16	0.68	<.01
	Right	0.52	.01	0.16	.56	0.28	.29
Frontal pole	Left	0.86	<.01	0.72	<.01	0.88	<.01
	Right	0.81	<.01	0.92	<.01	0.89	<.01

HC Group		**Baseline & FU1**		**FU1 & FU2**		**Baseline & FU2**	
Cortical Area	**Side**	***r***	***p***	***r***	***p***	***r***	***p***
Inferior fronal gyrus (oper)	Left	0.92	<.01	0.92	<.01	0.85	<.01
	Right	0.94	<.01	0.91	<.01	0.93	<.01
Inferior fronal gyrus (orb)	Left	0.84	<.01	0.86	<.01	0.80	<.01
	Right	0.90	<.01	0.86	<.01	0.87	<.01
Inferior fronal gyrus (tri)	Left	0.86	<.01	0.91	<.01	0.87	<.01
	Right	0.85	<.01	0.94	<.01	0.93	<.01
Lateral orbitofrontal	Left	0.75	<.01	0.91	<.01	0.91	<.01
	Right	0.70	<.01	0.72	.01	0.77	.01
Medial orbitofrontal	Left	0.69	<.01	0.84	<.01	0.84	<.01
	Right	0.63	<.01	0.75	.01	0.80	<.01
Frontal pole	Left	0.90	<.01	0.92	<.01	0.89	<.01
	Right	0.91	<.01	0.86	<.01	0.72	.01

Note: BN = bulimia nervosa; FU1 = first follow-up; FU2 = second follow-up; oper = pars opercularis; orb = pars orbitalis; tri = pars triangularis.

Table S6. Test-Retest Pearson Correlations of Bulimia Nervosa (BN) Symptoms Between Assessments Within the BN Group

	Baseline & FU1		**FU1 & FU2**		**Baseline & FU2**	
Cortical Area	**r**	**p**	**r**	**p**	**r**	**p**
OBE (past 28 days)	0.62165	.0012	0.78564	.0005	0.23502	.3991
Vomiting (past 28 days)	0.46165	.0232	0.62608	.0125	-0.04421	.8757

Note: FU = follow-up; OBE = objective bulimic episodes.

Table S7. Growth Curve Models Predicting Cortical Thickness in Healthy Controls (HC) Vs. Bulimia Nervosa (BN)

		Left Hemisphere				Right Hemisphere			
Cortical Area	**Characteristic**[a]	***B***	***SE***	***t***	***p***	***B***	***SE***	***t***	***p***
Inferior frontal gyrus (oper)	Group	-0.08	0.03	-2.50	0.01	-0.07	0.04	-1.94	0.06
	Time	<0.01	<0.01	0.71	0.48	<0.01	<0.01	-2.35	0.02
	Group*Time	<0.01	<0.01	0.83	0.41	<0.01	<0.01	0.77	0.44
	Age	-0.02	0.01	-1.95	0.06	-0.01	0.01	-0.97	0.34
Inferior frontal gyrus (orb)	Group	-0.05	0.05	-0.93	0.36	0.09	0.06	1.60	0.11
	Time	<0.01	<0.01	2.23	0.03	<0.01	<0.01	2.60	0.01
	Group*Time	<0.01	<0.01	0.07	0.94	<0.01	<0.01	0.41	0.68
	Age	-0.01	0.01	-0.59	0.56	-0.03	0.02	-1.89	0.06
Inferior frontal gyrus (tri)	Group	-0.06	0.04	-1.60	0.12	-0.07	0.03	-1.90	0.06
	Time	<0.01	<0.01	0.52	0.61	<0.01	<0.01	-1.89	0.06
	Group*Time	<0.01	<0.01	0.78	0.44	<0.01	<0.01	1.54	0.13
	Age	-0.01	0.01	-0.80	0.43	-0.02	0.01	-2.57	0.01
Lateral orbitofrontal	Group	<0.01	0.04	0.10	0.92	-0.04	0.04	-0.83	0.41
	Time	0.01	<0.01	6.31	<0.01	0.01	<0.01	5.60	<0.01
	Group*Time	<0.01	<0.01	-1.76	0.08	<0.01	<0.01	-0.68	0.50
	Age	-0.02	0.01	-1.93	0.06	-0.01	0.01	-0.97	0.34
Medial orbitofrontal	Group	-0.03	0.04	-0.62	0.54	-0.05	0.04	-1.29	0.20
	Time	0.01	<0.01	5.19	<0.01	<0.01	<0.01	2.32	0.02
	Group*Time	<0.01	<0.01	-1.33	0.19	<0.01	<0.01	0.32	0.75
	Age	-0.02	0.01	-1.85	0.07	<0.01	0.01	0.42	0.68
Frontal pole	Group	-0.15	0.06	-2.38	0.02	-0.10	0.05	-2.02	0.05
	Time	<0.01	<0.01	0.44	0.66	<0.01	<0.01	1.03	0.31
	Group*Time	<0.01	<0.01	0.33	0.74	<0.01	<0.01	0.92	0.36
	Age	-0.02	0.02	-0.98	0.33	-0.02	0.01	-1.17	0.25

Note: oper = pars opercularis; orb = pars orbitalis; tri = pars triangularis.

[a] Group coded as HC=0, BN=1; Time coded as months from baseline; Age coded as years at baseline.

Table S8. Growth curve models predicting Cortical Thickness in Healthy Controls (HC) Vs. Remitted Bulimia Nervosa (BN)[a]

		Left Hemisphere				Right Hemisphere			
Cortical Area	**Characteristic**[b]	***B***	***SE***	***t***	***p***	***B***	***SE***	***t***	***p***
Inferior frontal gyrus (oper)	Group	-0.07	0.04	-1.77	0.08	-0.10	0.05	-2.22	0.03
	Time	<0.01	<0.01	0.72	0.47	<0.01	<0.01	-2.28	0.03
	Group*Time	<0.01	<0.01	0.03	0.97	<0.01	<0.01	0.32	0.75
	Age	-0.02	0.01	-2.07	0.04	-0.02	0.01	-1.30	0.20
Inferior frontal gyrus (orb)	Group	-0.03	0.06	-0.50	0.62	0.14	0.06	2.36	0.02
	Time	<0.01	<0.01	2.23	0.03	<0.01	<0.01	2.66	0.01
	Group*Time	<0.01	<0.01	-0.23	0.82	<0.01	<0.01	0.13	0.90
	Age	-0.02	0.01	-1.17	0.24	-0.03	0.02	-2.09	0.04
Inferior frontal gyrus (tri)	Group	-0.06	0.05	-1.37	0.18	-0.06	0.04	-1.56	0.12
	Time	<0.01	<0.01	0.51	0.61	<0.01	<0.01	-2.01	0.05
	Group*Time	<0.01	<0.01	0.03	0.98	<0.01	<0.01	1.59	0.12
	Age	-0.01	0.01	-1.11	0.27	-0.03	0.01	-2.59	0.01
Lateral orbitofrontal	Group	-0.01	0.04	-0.13	0.90	-0.03	0.05	-0.52	0.61
	Time	0.01	<0.01	7.03	<0.01	0.01	<0.01	5.45	<0.01
	Group*Time	<0.01	<0.01	-1.93	0.06	<0.01	<0.01	-0.91	0.36
	Age	-0.02	0.01	-2.26	0.03	-0.02	0.01	-1.45	0.15
Medial orbitofrontal	Group	-0.06	0.05	-1.17	0.25	-0.05	0.04	-1.18	0.24
	Time	0.01	<0.01	5.83	<0.01	<0.01	<0.01	2.41	0.02
	Group*Time	<0.01	<0.01	-1.73	0.09	<0.01	<0.01	-0.27	0.79
	Age	-0.02	0.01	-1.65	0.10	<0.01	0.01	-0.36	0.72
Frontal pole	Group	-0.12	0.07	-1.76	0.08	-0.11	0.06	-1.80	0.08
	Time	0.00	0.00	0.48	0.64	0.00	0.00	1.02	0.31
	Group*Time	0.00	0.00	-0.23	0.82	0.00	0.00	0.46	0.65
	Age	-0.02	0.02	-1.40	0.17	-0.02	0.02	-1.41	0.16

Note: Oper = pars opercularis; orb = pars orbitalis.

[a] Remission is defined as >50% reduction in the frequency of objective bulimic episodes and vomiting episodes between baseline and last assessment.

[b] Group coded as HC=0, BN=1; Time coded as months from baseline; Age coded as years at baseline.

Table S9. Multilevel Models of Cortical Thickness (CT) Predicting the Frequency of Episodes Over the Past 28 Days Prior to Scanning

OBEs		**Between-subject**[a]				**Within-subject**[b]			
Cortical Area	**Side**	***B***	***SE***	***t***	***p***	***B***	***SE***	***t***	***p***
Inferior frontal gyrus (oper)	Left	-2.42	2.16	-1.12	0.27	4.00	3.03	1.32	0.19
	Right	-1.28	1.79	-0.72	0.48	-0.52	4.02	-0.13	0.90
Inferior frontal gyrus (orb)	Left	-1.14	1.47	-0.77	0.45	-0.25	1.90	-0.13	0.90
	Right	-1.87	1.30	-1.44	0.16	2.46	2.31	1.07	0.29
Inferior frontal gyrus (tri)	Left	-0.87	1.74	-0.50	0.62	2.31	2.39	0.97	0.34
	Right	-1.38	2.12	-0.65	0.52	0.68	2.76	0.25	0.81
Lateral orbitofrontal	Left	3.60	2.36	1.53	0.14	-0.39	1.93	-0.20	0.84
	Right	-1.61	2.07	-0.78	0.45	1.12	1.59	0.70	0.49
Medial orbitofrontal	Left	0.26	1.91	0.14	0.89	0.35	1.41	0.25	0.81
	Right	0.39	2.62	0.15	0.88	-0.02	1.78	-0.01	0.99
Frontal pole	Left	-2.63	1.05	-2.50	0.02	2.45	1.93	1.27	0.21
	Right	-1.44	1.28	-1.12	0.27	-0.02	2.20	-0.01	0.99

Vomiting Episodes		**Between-subject**[a]				**Within-subject**[b]			
Cortical Area	**Side**	***B***	***SE***	***t***	***p***	***B***	***SE***	***t***	***p***
Inferior frontal gyrus (oper)	Left	-0.35	2.24	-0.15	0.88	3.80	3.45	1.10	0.28
	Right	-0.92	1.82	-0.50	0.62	3.17	4.90	0.65	0.52
Inferior frontal gyrus (orb)	Left	-2.81	1.41	-1.99	0.06	3.46	2.26	1.53	0.13
	Right	-3.40	1.20	-2.84	0.01	3.45	2.60	1.32	0.19
Inferior frontal gyrus (tri)	Left	0.39	1.78	0.22	0.83	5.56	2.74	2.02	0.05
	Right	1.20	2.14	0.56	0.58	2.98	3.03	0.99	0.33
Lateral orbitofrontal	Left	-1.33	2.54	-0.53	0.60	1.90	2.23	0.85	0.40
	Right	-3.99	1.92	-2.08	0.05	0.26	1.91	0.14	0.89
Medial orbitofrontal	Left	-2.18	1.87	-1.17	0.25	0.82	1.63	0.50	0.62
	Right	-2.79	2.64	-1.06	0.30	-1.99	2.13	-0.93	0.36
Frontal pole	Left	-1.90	1.11	-1.70	0.10	3.36	2.25	1.50	0.14
	Right	-0.98	1.29	-0.76	0.46	-0.39	2.46	-0.16	0.88

Note: OBEs = objective bulimic episodes; Oper = pars opercularis; orb = pars orbitalis.

[a] Average CT over time is used as the between-subject predictor.

[b] Deviation at each time point from each participant's own average CT over time is used as the within-subject predictor.