

Supplementary Methods: Imaging Parameters

Each site followed the Alzheimer's Disease Neuroimaging Initiative (ADNI) protocol appropriate for each scanner brand and model. The MPRAGE acquisition parameters were comparable across sites:

Site 1: 3D acquisitions, sagittal slab, shot interval 2300ms, inversion time 700ms, TR 6.988ms, TE 2.848ms, flip angle 8°, FOV 260 (foot-to-head) x 260 (anterior-to-posterior) mm², matrix 256x256, in-plane resolution 1.016x1.016 mm², 166 slices (left-to-right), slice thickness 1.2 mm, voxel size 1.016x1.016x1.2mm³, total scan duration 10 min 28 sec.

Site 2: 3D acquisitions, sagittal slab, shot interval 3000ms, inversion time 846ms, TR 6.8ms, TE 3.1ms, flip angle 8°, FOV 256 (foot-to-head) x 240 (anterior-to-posterior) mm², matrix 256x240, in-plane resolution 1 x 1 mm², 170 slices (left-to-right), slice thickness 1.2 mm, voxel size 1x1x1.2mm³, total scan duration 9 min 19 sec.

Site 3: 3D acquisitions, sagittal slab, shot interval 2300ms, inversion time 900ms, TR 7.2ms, TE 2.91ms, flip angle 9°, FOV 256 (foot-to-head) x 240 (anterior-to-posterior) mm², matrix 256x240, in-plane resolution 1x1 mm², 160 slices (left-to-right), slice thickness 1.2 mm, voxel size 1x1x1.2mm³, total scan duration 9 min 14 sec.

Site 4: 3D acquisitions, sagittal slab, shot interval 2300ms, inversion time 900ms, TR 6.8ms, TE 2.91ms, flip angle 9°, FOV 256 (foot-to-head) x 240 (anterior-to-posterior) mm², matrix 256x240, in-plane resolution 1x1 mm², 160 slices (left-to-right), slice thickness 1.2 mm, voxel size 1x1x1.2mm³, total scan duration 9 min 14 sec.

To ensure between- and within-site data compatibility, standardized ADNI phantoms at each site were imaged weekly, and drift in linear gradient calibration was monitored regularly throughout the study. Measurements of non-linear geometric fidelity and correction for gradient non-linearity occurred once at each site, and again in the event of a hardware upgrade.

Table S1. The rates of lifetime DSM-IV psychiatric disorders in relatives

N (%)	Relatives of Schizophrenia Probands (n=134)	Relatives of Schizoaffective Probands (n=106)	Relatives of Bipolar Probands (n=129)
Unaffected (no Axis I, II diagnoses)	54 (40.3)	40 (37.74)	47 (36.43)
Axis I diagnoses (SCID-I/P)*			
• Bipolar disorder	2 (1.49)	5 (4.72)	12 (9.3)
• Major depressive disorder	39 (29.1)	33 (31.13)	35 (27.13)
• Substance use disorder	32 (23.88)	19 (17.92)	31 (24.03)
• Anxiety disorder	22 (16.42)	23 (21.7)	29 (22.48)
• Other	12 (8.96)	9 (8.49)	13 (10.08)
Axis II diagnoses (SIDP-IV)			
• Psychosis Spectrum/Cluster A personality disorder			
Paranoid	11 (8.21)	16 (15.09)	7 (5.43)
Schizoid	10 (7.46)	11 (10.38)	4 (3.1)
Schizotypal	1 (0.75)	6 (5.66)	2 (1.55)
Schizotypal	0 (0.0)	3 (2.83)	2 (1.55)
• Cluster B personality disorder			
Borderline	6 (4.48)	9 (8.49)	7 (5.43)
Borderline	1 (0.75)	5 (4.72)	4 (3.1)
Antisocial	5 (3.73)	4 (3.77)	2 (1.55)
Narcissistic	3 (2.24)	3 (2.83)	3 (2.33)
Histrionic	0 (0.0)	0 (0.0)	0 (0.0)
• Cluster C personality disorder			
Dependent	21 (15.67)	9 (8.49)	15 (11.63)
Dependent	1 (0.75)	0 (0.0)	0 (0.0)
Avoidant	7 (5.22)	4 (3.77)	7 (5.43)
Obsessive - compulsive	14 (10.45)	6 (5.66)	9 (6.98)
Multiple Axis I and /or II diagnoses	52 (38.81)	42 (39.62)	47 (36.43)

* Relatives with lifetime DSM-IV Axis I diagnoses of psychotic disorders were not included in this analysis. Therefore, all reported Axis I diagnoses are restricted to non-psychotic disorders. Each Axis I-II diagnosis in relatives is reported separately. The number of relatives who had more than one Axis I/II diagnosis is indicated under 'Multiple Axis I and/or II diagnoses'.

DSM-IV – the Diagnostic and Statistical Manual of Mental Disorders, 4th edition, American Psychiatric Association (1994), SCID-I/P – the Structured Clinical Interview for DSM-IV Axis I Disorders, SIDP-IV – the Structured Interview for DSM-IV Personality Diagnoses

Table S2. Regions of gray matter volume difference between the psychosis dimension and healthy control groups based on Voxel-Based Morphometry

Group comparison	Brain region	Volume (Voxels)	Maximum <i>t</i> (Talairach coordinates: x, y, z) *
		Left / Right	Left / Right
The psychosis dimension groups vs. healthy controls comparisons			
HC – Probands	<i>Frontal</i>		
	Middle frontal gyrus	6993 / 8563	8.4 (-30, 50, 2) / 8.1 (25, 55, -8)
	Superior frontal gyrus	5926 / 6044	9.9 (-10, 51, -1) / 8.6 (7, 59, -7)
	Inferior frontal gyrus	5659 / 5956	7.8 (-42, 20, -5) / 8.3 (42, 23, -4)
	Medial frontal gyrus	5778 / 5333	10.7 (-6, 50, 9) / 9.7 (4, 52, 13)
	Precentral gyrus	4267 / 4237	6.9 (-49, -11, 10) / 7.3 (43, -5, 43)
	Paracentral lobule	889 / 1037	7.6 (-7, -14, 44) / 8.1 (9, -24, 44)
	Rectal gyrus	593 / 622	8.4 (-1, 37, -21) / 8.2 (4, 37, -20)
	Orbital gyrus	207 / 237	8.7 (-3, 44, -19) / 7.8 (3, 46, -20)
		<i>Cingulate gyrus</i>	
	Cingulate gyrus (BA 23, 24, 31, 32)	4148 / 3970	8.7 (-7, 13, 37) / 8.6 (9, -24, 39)

Anterior cingulate	1926 / 1985	10.0 (-6, 54, -1) / 9.3 (7, 47, 9)
Posterior cingulate	1422 / 1452	7.2 (-7, -59, 13) / 7.3 (9, -56, 10)
<i>Insula</i>	3615 / 3911	7.1 (-40, 20, 0) / 7.5 (39, 20, 2)
<i>Temporal</i>		
Middle temporal gyrus	5985 / 6874	6.3 (-58, -14, -8) / 6.5 (64, -36, 2)
Superior temporal gyrus	5570 / 5867	6.8 (-52, -10, 7) / 6.9 (48, 3, 1)
Parahippocampal gyrus	3526 / 4178	8.0 (-31, -15, -16) / 7.3 (30, -16, -19)
Fusiform gyrus	2696 / 2252	6.6 (-49, -17, -26) / 6.4 (37, -17, -23)
Inferior temporal gyrus	1985 / 1926	6.5 (-52, -17, -28) / 6.6 (49, -69, -2)
Uncus	948 / 681	7.1 (-30, -2, -19) / 6.6 (37, -16, -27)
Transverse temporal gyrus	356 / 296	6.7 (-50, -16, 10) / 6.8 (56, -20, 12)
<i>Parietal</i>		
Precuneus	5333 / 5570	7.0 (-1, -60, 18) / 6.9 (3, -60, 20)
Inferior parietal lobule	1896 / 3674	5.1 (-59, -40, 23) / 6.8 (55, -25, 22)
Postcentral gyrus	1393 / 3644	6.5 (-50, -12, 14) / 7.2 (56, -23, 15)

Supramarginal gyrus	770 / 1244	4.8 (-10, -63, 54) / 5.7 (28, -72, 45)
Superior parietal lobule	830 / 1067	4.9 (-59, -42, 26) / 6.2 (55, -57, 30)
Angular gyrus	504 / 415	3.7 (-45, -71, 35) / 6.3 (53, -57, 35)

Occipital

Cuneus	3615 / 3289	7.1 (-9, -59, 8) / 7.0 (9, -59, 7)
Lingual gyrus	2726 / 3289	6.3 (-12, -55, 4) / 6.9 (12, -54, 4)
Middle occipital gyrus	2519 / 2281	5.3 (-28, -88, 14) / 6.4 (52, -66, -3)
Inferior occipital gyrus	830 / 711	3.9 (-46, -79, -1) / 5.8 (43, -72, -4)
Superior occipital gyrus	296 / 207	3.5 (-31, -78, 33) / 5.2 (33, -79, 30)

Basal ganglia

Caudate	- / 711	- / 5.2 (36, -15, -9)
Clastrum	237 / 385	6.3 (-34, 3, 5) / 6.6 (30, 20, -1)
Lentiform Nucleus	237 / 267	3.7 (-28, -5, 11) / 3.9 (16, 5, -10)

<i>Thalamus</i>	1304 / 1630	6.1 (-3, -10, 2) / 5.9 (3, -10, 2)
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Cerebellum

Culmen	2193 / 2459	5.5 (-19, -27, -15) / 5.8 (9, -54, 1)
Declive	1037 / 1570	4.3 (-16, -59, -18) / 4.6 (25, -62, -11)
Inferior semi-lunar lobule	- / 711	- / 3.7 (25, -65, -41)
Uvula	- / 415	- / 3.6 (28, -65, -23)
Pyramis	- / 356	- / 3.3 (24, -73, -27)
Cerebellar tonsil	- / 326	- / 3.9 (25, -60, -42)

**HC – Relatives with
Psychosis
Spectrum
Personality
Disorders**

Frontal		
Superior frontal gyrus	3704 / 2133	4.8 (-9, 62, -11) / 4.3 (39, 50, 14)
Medial frontal gyrus	3556 / 2637	4.8 (-9, 49, 10) / 4.3 (6, 37, -14)
Middle frontal gyrus	3378 / 2578	4.8 (-33, 54, 4) / 4.4 (36, 50, 11)
Inferior frontal gyrus	1600 / 1037	4.7 (-43, 48, 2) / 3.7 (46, 28, -3)
Precentral gyrus	1185 / 770	5.5 (-56, -5, 11) / 4.3 (58, -7, 11)
Paracentral lobule	- / 237	- / 3.7 (9, -24, 43)
Rectal gyrus	241/ -	3.7 (-1, 25, -19) / -

Cingulate gyrus

Cingulate gyrus (BA 9, 24, 31, 32)	2370 / 2726	4.2 (-9, -11, 36) / 4.9 (10, 28, 28)
Anterior cingulate	1215 / 1067	4.9 (-7, 44, 3) / 4.7 (10, 30, 25)
Posterior cingulate	770 / 326	3.9 (-3, -58, 14) / 3.7 (3, -55, 14)

Temporal

Middle temporal gyrus	4415 / 2400	5.0 (-59, -44, -2) / 4.7 (55, -57, -8)
Superior temporal gyrus	2963 / 1363	5.2 (-59, -5, 9) / 3.9 (56, -10, 9)
Inferior temporal gyrus	1778 / 889	4.9 (-64, -46, -8) / 4.7 (55, -60, -6)
Fusiform gyrus	1304 / 1689	4.7 (-48, -44, -13) / 4.5 (34, -34, -17)
Parahippocampal gyrus	415 / 1037	4.2 (-31, -10, -26) / 4.3 (28, -51, -6)
Uncus	711 / 119	4.5 (-33, -13, -28) / 3.7 (33, -14, -27)
Transverse temporal gyrus	- / 237	- / 4.4 (62, -8, 13)

Parietal

Postcentral gyrus	711 / 1689	5.2 (-59, -5, 14) / 4.6 (58, -14, 16)
Precuneus	859 / 385	3.8 (-10, -46, 45) / 3.5 (42, -67, 36)
Inferior parietal lobule	504 / 741	3.8 (-55, -33, 43) / 3.8 (64, -23, 26)

Supramarginal gyrus	296 / -	3.9 (-52, -51, 23) / -
Angular gyrus	- / 296	- / 3.8 (42, -62, 35)
<i>Occipital</i>		
Middle occipital gyrus	119 / 563	4.0 (-53, -63, -8) / 4.6 (52, -63, -6)
Lingual gyrus	- / 533	- / 4.0 (27, -60, -6)
<i>Cerebellum</i>		
Declive	207 / 1037	3.4 (-28, -66, -21) / 3.9 (34, -65, -11)
Culmen	326 / 622	3.7 (-39, -42, -19) / 4.3 (34, -37, -20)

The psychosis dimension groups comparisons

Non-Psychotic Relatives – Probands	<i>Frontal</i>		
	Middle frontal gyrus	7052 / 8207	8.1 (-36, 34, 11) / 8.6 (31, 52, 18)
	Superior frontal gyrus	5719 / 6400	9.2 (-10, 52, -1) / 8.6 (24, 47, 17)
	Inferior frontal gyrus	5244 / 5659	8.3 (-33, 32, -9) / 9.0 (43, 22, -5)
	Medial frontal gyrus	5333 / 5037	9.6 (-1, 57, -3) / 9.4 (3, 57, -4)

Precentral gyrus	4681 / 4770	7.1 (-43, 3, 7) / 7.2 (45, 18, 35)
Paracentral lobule	1037 / 1126	7.4 (-3, -21, 43) / 7.5 (4, -23, 43)
Rectal gyrus	622 / 504	9.0 (-1, 33, -19) / 9.1 (6, 30, -19)
Orbital gyrus	237 / 326	8.8 (-3, 40, -21) / 8.9 (4, 43, -19)
 <i>Cingulate gyrus</i>		
Cingulate gyrus (BA 23, 24, 31, 32)	3763 / 3615	7.8 (-9, 12, 39) / 8.0 (12, 18, 36)
Anterior cingulate	1926 / 1807	9.4 (-1, 52, -1) / 8.9 (4, 54, -1)
Posterior cingulate	1304 / 1393	5.5 (-4, -62, 14) / 5.5 (6, -59, 24)
 <i>Insula</i>		
	3259 / 3022	7.9 (-40, 17, -2) / 7.9 (40, 16, -2)
 <i>Temporal</i>		
Middle temporal gyrus	6519 / 6400	6.8 (-62, -18, -7) / 7.0 (64, -26, -2)
Superior temporal gyrus	5719 / 5867	7.2 (-56, -3, 3) / 7.4 (50, 0, 3)
Parahippocampal gyrus	3259 / 3230	5.7 (-34, -14, -18) / 5.7 (19, 6, -17)
Fusiform gyrus	2074 / 2133	4.9 (-48, -19, -24) / 5.1 (48, -19, -24)
Inferior temporal gyrus	2074 / 1630	5.3 (-55, -15, -16) / 5.8 (59, -8, -16)

Uncus	622 / 504	4.6 (-36, -13, -27) / 5.1 (28, 6, -22)
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Transverse temporal gyrus	326 / 385	6.9 (-61, -18, 11) / 7.3 (56, -20, 13)
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Parietal

Precuneus	5452 / 5393	6.0 (-4, -34, 45) / 6.7 (6, -33, 43)
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Inferior parietal lobule	3733 / 3763	6.2 (-59, -42, 24) / 6.9 (59, -27, 22)
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Postcentral gyrus	2133 / 3763	6.1 (-49, -11, 17) / 7.5 (56, -22, 16)
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Superior parietal lobule	1126 / 1244	5.2 (-34, -65, 50) / 6.0 (28, -73, 47)
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Supramarginal gyrus	919 / 889	6.2 (-55, -46, 22) / 6.0 (58, -45, 23)
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Angular gyrus	563 / 356	5.1 (-49, -68, 32) / 5.0 (36, -76, 33)
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Occipital

Cuneus	2874 / 3052	5.4 (0, -66, 30) / 5.8 (30, -78, 33)
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Lingual gyrus	2933 / 2815	5.0 (-25, -82, -3) / 5.8 (27, -82, -3)
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Middle occipital gyrus	2459 / 2193	5.5 (-25, -87, 15) / 5.5 (33, -78, 18)
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Inferior occipital gyrus	830 / 741	4.8 (-30, -79, -4) / 5.2 (30, -82, -6)
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Superior occipital gyrus	296 / 207	5.0 (-34, -79, 32) / 5.9 (31, -80, 29)
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Basal ganglia			
	Caudate	237 / 504	4.5 (-7, 14, -6) / 5.1 (9, 17, -6)
	Lentiform nucleus	296 / 415	4.0 (-31, -18, -5) / 4.6 (12, 6, -4)
	Clastrum	237 / 267	5.6 (-31, 13, 2) / 6.0 (30, 16, 2)
	Thalamus	1363 / 1600	8.4 (-6, -10, 3) / 7.6 (6, -10, 1)
Cerebellum			
	Culmen	1926 / 1807	4.3 (-6, -58, 0) / 4.6 (18, -27, -14)
	Inferior semi-lunar lobule	- / 444	3.6 (-1, -60, -41) / 4.0 (3, -59, -42)
	Declive	356 / 385	3.1 (-19, -66, -22) / 3.2 (25, -63, -11)
	Cerebellar tonsil	207 / 385	3.4 (-1, -52, -42) / 3.6 (3, -53, -41)
Non-Psychotic Relatives –	Frontal		
	Superior frontal gyrus	3141 / 1630	4.3 (-31, 47, 16) / 4.6 (24, 47, 17)
Relatives with Psychosis	Middle frontal gyrus	2933 / 2489	4.5 (-31, 44, 13) / 4.4 (24, 50, 13)
Spectrum Personality	Medial frontal gyrus	2785 / 1244	4.2 (-9, 22, -18) / 4.1 (9, 37, -14)

Disorders	Inferior frontal gyrus	1067 / -	4.2 (-42, -50, 2) / 3.6 (46, 29, -3)
	Precentral gyrus	859 / 533	5.2 (-56, -5, 11) / 4.4 (58, -7, 13)
	Rectal gyrus	385 / -	4.2 (-9, 19, -21) / 4.0 (3, 27, -19)
<i>Cingulate gyrus</i>			
	Anterior cingulate	444 / 119	3.7 (-12, 36, 22) / 3.8 (12, 33, 23)
	Cingulate gyrus (BA 31, 32)	356 / 387	3.9 (-13, -42, 41) / 4.4 (12, 28, 29)
<i>Temporal</i>			
	Middle temporal gyrus	3052 / 593	4.6 (-58, -42, -3) / 4.1 (53, -44, -12)
	Superior temporal gyrus	1985 / 770	5.1 (-59, -3, 7) / 4.0 (61, -2, 8)
	Inferior temporal gyrus	919 / 444	4.4 (-52, -52, -14) / 4.2 (55, -49, -11)
	Fusiform gyrus	356 / 504	4.1 (-49, -49, -14) / 3.9 (55, -50, -15)
	Transverse temporal gyrus	- / 237	- / 4.4 (59, -11, 13)
<i>Parietal</i>			
	Postcentral gyrus	356 / 1541	4.8 (-56, -8, 14) / 4.5 (56, -9, 16)
	Inferior parietal lobule	741 / 267	4.3 (-55, -33, 42) / 3.7 (45, -29, 41)

Supramarginal gyrus	504 / -	4.3 (-55, -51, 23) / -
Precuneus	474 / -	4.0 (-12, -44, 44) / -
<i>Occipital</i>		
Middle occipital gyrus	- / 237	- / 3.8 (53, -61, -6)

* Coordinates for peak t values are reported based of Group ICA for fMRI Toolbox, GIFT1.3i. All outcomes are presented at $p=.005$, False Discovery Rate-corrected, $k=200$ voxels threshold.

BA – Brodmann area

Table S3. Regions of gray matter volume difference between the DSM-IV diagnoses proband and healthy control groups based on Voxel-Based Morphometry

Group comparison	Brain region	Volume (Voxels)	Maximum <i>t</i> (Talairach coordinates: x, y, z)*
		Left / Right	Left / Right
The DSM-IV proband groups vs. healthy controls comparisons			
Healthy Controls – Probands with Schizophrenia	<i>Frontal</i>		
	Middle frontal gyrus	6252 / 7200	8.6 (-28, 51, -4) / 7.5 (36, 50, 10)
	Superior frontal gyrus	5185 / 5985	9.2 (-10, 51, -1) / 8.0 (6, 63, -2)
	Inferior frontal gyrus	4919 / 5867	8.1 (-36, 17, -11) / 9.0 (43, 22, -4)
	Medial frontal gyrus	5244 / 4919	9.9 (-4, 47, 10) / 9.0 (6, 46, 12)
	Precentral gyrus	4296 / 4237	7.0 (-46, -10, 9) / 8.0 (52, 18, 7)
	Paracentral lobule	830 / 741	7.0 (-9, -12, 45) / 7.5 (7, -14, 44)
	Rectal gyrus	504 / 533	8.2 (-3, 35, -19) / 8.0 (4, 34, -19)
	Orbital gyrus	237 / 296	8.2 (-1, 44, -20) / 8.1 (4, 40, -20)
		<i>Cingulate gyrus</i>	
	Cingulate gyrus (BA 23, 24, 31, 32)	3970 / 3407	8.9 (-4, 20, 28) / 8.8 (7, 29, 28)
	Anterior cingulate	2015 / 1956	10.1 (-4, 47, 6) / 9.2 (6, 48, 3)
	Posterior cingulate	1541 / 1511	6.1 (-9, -61, 11) / 6.5 (10, -56, 10)

<i>Insula</i>	3081 / 3319	7.3 (-36, 14, -5) / 8.2 (42, 14, -2)
<i>Temporal</i>		
Middle temporal gyrus	5778 / 6193	6.1 (-62, -35, -2) / 7.4 (64, -36, 3)
Superior temporal gyrus	5719 / 5778	7.8 (-31, 4, -15) / 7.8 (33, 6, -17)
Parahippocampal gyrus	3496 / 3526	8.2 (-30, -14, -14) / 7.8 (31, -13, -17)
Fusiform gyrus	2281 / 1807	6.3 (-27, -56, -7) / 6.2 (27, -62, -8)
Inferior temporal gyrus	1896 / 1837	5.5 (-56, -16, -27) / 6.0 (39, -9, -37)
Uncus	800 / 711	7.5 (-30, 3, -20) / 7.7 (31, 3, -19)
Transverse temporal gyrus	296 / 356	6.5 (-52, -16, 10) / 6.8 (61, -15, 13)
<i>Parietal</i>		
Precuneus	4770 / 5037	5.8 (-3, -62, 18) / 6.0 (10, -59, 18)
Inferior parietal lobule	830 / 3496	5.2 (-49, -46, 22) / 6.6 (62, -26, 25)
Postcentral gyrus	1363 / 2667	6.1 (-50, -15, 15) / 7.1 (59, -20, 15)
Superior parietal lobule	296 / 741	3.8 (-10, -64, 54) / 4.3 (24, -69, 44)
Supramarginal gyrus	652 / 889	5.1 (-52, -48, 22) / 5.3 (52, -54, 23)
Angular gyrus	148 / 356	3.2 (-34, -74, 30) / 5.0 (50, -58, 36)

Occipital

Lingual gyrus	3111 / 2548	6.2 (-27, -60, -6) / 6.8 (27, -59, -6)
Cuneus	2815 / 2933	5.9 (-9, -58, 8) / 6.1 (9, -59, 7)
Middle occipital gyrus	2193 / 1867	4.8 (-45, -73, 4) / 5.6 (52, -63, -6)
Inferior occipital gyrus	593 / 652	3.8 (-42, -72, -4) / 5.7 (28, -82, -6)
Superior occipital gyrus	296 / 119	3.5 (-34, -81, 32) / 4.3 (33, -80, 26)

Basal ganglia

Caudate	741 / 830	4.3 (-10, 15, 10) / 5.2 (6, 14, -3)
Clastrum	356 / 652	4.2 (-24, -10, -6) / 4.6 (28, -9, -6)
Lentiform nucleus	356 / 415	6.1 (-36, -19, -2) / 6.2 (30, 17, -2)

Thalamus

	1719 / 1896	7.0 (-7, -11, 10) / 6.4 (9, -14, 10)
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Cerebellum

Culmen	2252 / 2459	5.8 (-16, -30, -11) / 6.3 (18, -37, -10)
Declive	1689 / 1630	5.5 (-28, -53, -11) / 5.6 (27, -65, -11)
Inferior semi-lunar lobule	770 / 1393	3.4 (-28, -73, -42) / 5.1 (18, -71, -42)

Pyramis	622 / 859	3.4 (0, -65, -23) / 4.6 (22, -73, -27)
Uvula	444 / 830	3.5 (-24, -64, -25) / 4.8 (34, -77, -25)
Tuber	237 / 593	3.2 (-33, -71, -30) / 4.7 (37, -74, -25)
Cerebellar tonsil	89 / 326	3.0 (-30, -66, -33) / 4.0 (24, -60, -40)

**Healthy
Controls –
Probands with
Schizoaffective
Disorder**

Frontal

Middle frontal gyrus	6726 / 7378	7.5 (-30, 54, 3) / 6.8 (25, 55, -8)
Superior frontal gyrus	5096 / 6015	7.8 (-27, 55, 0) / 7.5 (7, 61, -2)
Inferior frontal gyrus	5037 / 5422	6.7 (-40, 50, 0) / 6.6 (46, 33, -13)
Medial frontal gyrus	5363 / 5096	9.0 (-4, 50, 9) / 8.2 (4, 53, 15)
Precentral gyrus	3644 / 4089	5.7 (-56, 11, 11) / 5.8 (49, 3, 37)
Paracentral lobule	1037 / 1304	6.6 (-6, -15, 44) / 7.1 (7, -28, 43)
Rectal gyrus	593 / 590	6.9 (-1, 33, -19) / 6.6 (3, 34, -21)
Orbital gyrus	296 / 237	7.5 (-3, 46, -19) / 6.9 (3, 43, -19)

Cingulate gyrus

Cingulate gyrus (BA 23, 24, 31, 32)	3496 / 3407	7.0 (-6, 14, 38) / 7.4 (7, -26, 40)
Anterior cingulate	1985 / 1778	8.4 (-7, 52, -1) / 7.4 (6, 49, -1)

Posterior cingulate	1659 / 1304	6.8 (-6, -59, 13) / 6.8 (7, -56, 12)
<i>Insula</i>	3052 / 3022	6.0 (-43, 10, 1) / 5.8 (43, -1, 8)
<i>Temporal</i>		
Middle temporal gyrus	5630 / 6459	5.9 (-59, -14, -8) / 5.9 (39, -75, 22)
Superior temporal gyrus	5126 / 5393	5.8 (-49, 1, 0) / 5.9 (53, -58, 28)
Parahippocampal gyrus	3496 / 3793	6.1 (-30, -17, -18) / 5.9 (30, -16, -21)
Fusiform gyrus	2430 / 2015	5.4 (-49, -20, -24) / 5.3 (39, -17, -26)
Inferior temporal gyrus	1926 / 1689	5.4 (-49, -17, -27) / 6.1 (49, -70, -2)
Uncus	830 / 770	5.6 (-34, -13, -27) / 5.3 (36, -12, -28)
Transverse temporal gyrus	444 / 326	5.5 (-55, -13, 10) / 5.8 (56, -21, 13)
<i>Parietal</i>		
Precuneus	5037 / 5126	6.6 (-1, -60, 20) / 6.7 (4, -59, 20)
Inferior parietal lobule	1956 / 3378	5.1 (-58, -40, 24) / 6.1 (50, -59, 38)
Postcentral gyrus	1126 / 2815	5.2 (-50, -24, 14) / 6.0 (56, -24, 16)
Supramarginal gyrus	770 / 859	4.5 (-59, -44, 26) / 6.1 (53, -58, 32)
Superior parietal lobule	800 / 771	5.1 (-7, -63, 56) / 5.7 (27, -74, 44)

Angular gyrus	415 / 385	3.6 (-50, -65, 32) / 6.2 (53, -56, 36)
<i>Occipital</i>		
Cuneus	3141 / 3200	6.2 (-9, -62, 7) / 6.3 (10, -59, 7)
Lingual gyrus	3022 / 3081	6.0 (-9, -60, 4) / 6.2 (10, -57, 4)
Middle occipital gyrus	1985 / 1867	4.6 (-43, -76, 3) / 6.1 (49, -69, -3)
Inferior occipital gyrus	593 / 596	4.1 (-45, -76, -1) / 5.6 (45, -76, -5)
Superior occipital gyrus	237 / 119	3.3 (-34, -86, 22) / 5.9 (33, -77, 33)
<i>Basal ganglia</i>		
Clastrum	326 / 119	4.8 (-33, 6, 5) / 4.8 (36, -4, 7)
<i>Thalamus</i>		
	533 / 830	4.4 (-3, -10, 9) / 4.4 (4, -9, 3)
<i>Cerebellum</i>		
Culmen	1896 / 1985	4.6 (-9, -51, 1) / 5.5 (10, -54, -1)
Declive	978 / 1452	4.1 (-31, -68, -12) / 4.5 (25, -63, -11)
Tuber	- / 356	- / 3.5 (39, -74, -23)
Inferior semi-lunar lobule	- / 267	- / 3.4 (28, -62, -42)

	Uvula	- / 296	2.8 (-27, -65, -24) / 3.7 (34, -62, -23)
	Cerebellar tonsil	- / 237	- / 3.6 (34, -41, -31)
Healthy Controls – Probands with Psychotic Bipolar I Disorder	Frontal		
	Medial frontal gyrus	2341 / 2904	5.1 (-4, 50, 3) / 5.3 (4, 50, 15)
	Inferior frontal gyrus	1719 / 2252	4.6 (-30, 8, -18) / 4.8 (31, 8, -16)
	Precentral gyrus	- / 2074	- / 5.3 (43, -7, 42)
	Middle frontal gyrus	563 / 1244	4.0 (-33, 39, -13) / 4.6 (36, -5, 43)
	Superior frontal gyrus	444 / 1067	4.3 (-12, 52, -1) / 4.3 (21, 57, -5)
	Cingulate gyrus		
	Cingulate gyrus (BA 23, 24, 31, 32)	2489 / 3022	4.3 (-6, -23, 36) / 4.9 (12, -10, 38)
	Anterior cingulate	830 / 859	5.2 (-4, 48, 7) / 5.2 (6, 46, -4)
	Posterior cingulate	652 / 563	4.2 (-3, -44, 20) / 4.3 (3, -48, 23)
	Insula	1274 / 1807	4.0 (-39, -1, 7) / 4.6 (45, -4, 8)
	Temporal		

	Parahippocampal gyrus	1719 / 1304	5.3 (-31, -1, -20) / 4.6 (29, 5, -17)
	Superior temporal gyrus	563 / 1422	5.1 (-34, -2, -18) / 5.0 (33, 5, -18)
	Uncus	237 / -	5.1 (-28, 2, -22) / -
<i>Parietal</i>			
	Precuneus	237 / -	3.8 (-13, -45, 40) / -
	Postcentral gyrus	- / 207	- / 3.7 (53, -7, 14)

The DSM-IV proband groups comparisons

Probands with Psychotic Bipolar I Disorder –	<i>Frontal</i>		
	Middle frontal gyrus	2667 / 830	4.5 (-43, 48, -7) / 4.2 (39, 53, 11)
	Inferior frontal gyrus	2281 / 1570	4.4. (-52, 11, 22) / 4.7 (58, 20, 11)
Probands with Schizophrenia	Medial frontal gyrus	1867 / -	4.7 (-12, 40, 12) / 3.4 (4, 41, -17)
	Superior frontal gyrus	1837 / 356	4.2 (-25, 20, 49) / 4.0 (40, 50, 14)
	Precentral gyrus	622 / 207	4.4 (-55, 15, 6) / 4.2 (52, 18, 9)
<i>Cingulate gyrus</i>			
	Anterior cingulate	1304 / 563	5.3 (-6, 33, 11) / 4.2 (3, 26, 17)

Cingulate gyrus (BA 24, 32)	978 / 563	4.6 (-3, 13, 28) / 4.1 (3, 13, 28)
<i>Temporal</i>		
Middle temporal gyrus	652 / 1244	4.2 (-65, -35, -3) / 4.4 (65, -38, 2)
Parahippocampal gyrus	504 / 978	3.7 (-21, -37, -3) / 4.4 (21, -37, -4)
Superior temporal gyrus	652 / 356	4.0 (-55, -50, 12) / 4.0 (64, -36, 6)
Fusiform gyrus	- / 652	- / 4.4 (43, -56, -12)
<i>Parietal</i>		
Precuneus	- / 1363	- / 4.1 (22, -68, 30)
Inferior parietal lobule	- / 711	- / 4.3 (59, -30, 33)
Superior parietal lobule	- / 267	- / 3.9 (22, -61, 56)
<i>Occipital</i>		
Lingual gyrus	- / 830	- / 4.3 (30, -75, -10)
Middle occipital gyrus	- / 356	- / 4.1 (34, -75, -10)
Cuneus	- / 296	- / 4.1 (22, -71, 33)
<i>Thalamus</i>	326 / -	3.7 (-6, -10, 13) / -

Cerebellum

Declive	- / 711	- / 4.1(33, -66, -12)
Tuber	- / 326	- / 4.2 (37, -75, -24)
Uvula	- / 267	- / 4.2 (33, -77, -23)

**Probands with
Psychotic
Bipolar I
Disorder –**

Frontal

Middle frontal gyrus	4563 / 1926	5.2 (-31, 45, 21) / 4.6 (25, 41, 34)
Superior frontal gyrus	3881 / 4207	5.0 (-30, 45, 17) / 4.7 (12, 49, 28)

**Probands with
Schizoaffective
Disorder**

Medial frontal gyrus	3911 / 2341	4.5 (-7, 54, 10) / 4.6 (4, 4, 59)
Inferior frontal gyrus	2015 / 978	4.6 (-49, 11, 24) / 4.5 (15, 19, -20)
Paracentral lobule	563 / 711	3.9 (-1, -28, 48) / 4.0 (4, -36, 57)
Rectal gyrus	593 / 652	4.9 (-3, 15, -22) / 4.9 (3, 16, -22)
Precentral gyrus	652 / -	4.3 (-49, 2, 37) / 3.6 (46, 19, 35)
Orbital gyrus	207 / -	4.3 (-7, 50, -20) / 4.6 (15, 22, -23)

Cingulate gyrus

Anterior cingulate	770 / -	4.3 (-4, 48, 7) / -
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Cingulate gyrus (BA 24, 31, 32)	681 / 267	3.8 (-4, 18, 38) / 3.6 (7, -27, 41)
Posterior cingulate	474 / 593	3.7 (-9, -62, 16) / 3.8 (9, -57, 18)
<i>Temporal</i>		
Middle temporal gyrus	1156 / 1778	4.2 (-64, -30, -14) / 5.4 (37, -75, 23)
Fusiform gyrus	- / 859	3.7 (-50, -26, -25) / 4.5 (48, -57, -11)
Inferior temporal gyrus	652 / 650	4.0 (-61, -33, -16) / 4.6 (52, -54, -11)
Superior temporal gyrus	652 / 326	4.3 (-53, 4, 0) / 3.9 (53, -58, 25)
	- / 297	- / 3.7 (39, -29, -19)
<i>Parietal</i>		
Precuneus	1956 / 3081	4.5 (-6, -58, 57) / 5.3 (31, -77, 36)
Inferior parietal lobule	237 / 1926	3.4 (-53, -50, 41) / 4.7 (36, -54, 47)
Superior parietal lobule	267 / 800	4.3 (-9, -61, 57) / 4.5 (27, -71, 45)
Postcentral gyrus	- / 444	3.2 (-4, -42, 64) / 4.0 (4, -39, 66)
Angular gyrus	- / 385	- / 4.8 (37, -73, 33)
<i>Occipital</i>		
Middle occipital gyrus	- / 1393	- / 4.8 (37, -73, 17)
Lingual gyrus	- / 830	- / 4.3 (28, -78, -10)

Cuneus	296 / 593	3.7 (-3, -75, 36) / 5.1 (31, -79, 32)
Inferior occipital gyrus	- / 504	3.2 (-27, -88, -9) / 4.6 (34, -84, -10)
<i>Cerebellum</i>		
Declive	- / 356	- / 3.7 (36, -67, -19)
Culmen	207 / -	3.7 (-31, -39, -27) / -

* Coordinates for peak t values are reported based of Group ICA for fMRI Toolbox, GIFT1.3i. All outcomes are presented at $p=.005$, False Discovery Rate-corrected, $k=200$ voxels threshold.

DSM-IV – the Diagnostic and Statistical Manual of Mental Disorders, 4th edition, American Psychiatric Association (1994), BA – Brodmann area

Table S4. Regional gray matter outcomes for inverse correlations with the Positive and Negative Syndrome Scale/Positive Subscale score in probands with schizoaffective disorder [$p=.005$, False Discovery Rate-corrected, $k=200$ voxels] and schizophrenia [$p=.05$, False Discovery Rate-corrected, $k=200$ voxels], and with lifetime duration of psychosis in probands with schizoaffective disorder [$p=.05$, False Discovery Rate-corrected, $k=200$ voxels]

Group	Brain region	Volume (Voxels)	Maximum t (Talairach coordinates: x, y, z)*
		Left / Right	Left / Right
The Positive and Negative Syndrome Scale, Positive Subscale Score			
Probands with Schizoaffective Disorder	<i>Frontal</i>		
	Superior frontal gyrus	2400 / 3556	5.2 (-16, 5, 63) / 5.0 (15, 42, 44)
	Middle frontal gyrus	948 / 2370	5.4 (-19, 7, 62) / 4.8 (19, 3, 59)
	Precentral gyrus	593 / 1007	3.9 (-39, -17, 45) / 4.1 (24, -10, 67)
	Medial frontal gyrus	504 / 741	4.5 (-12, 4, 58) / 4.4 (10, 43, 42)
	Inferior frontal gyrus	622 / -	4.0 (-46, 40, -12) / -
	Paracentral lobule	- / 296	- / 4.4 (7, -42, 53)
	<i>Cingulate gyrus</i>		
	Cingulate gyrus (BA 23, 24, 31)	1333 / 1067	4.3 (-3, -17, 30) / 4.4 (4, -16, 31)
	Posterior cingulate	978 / -	4.2 (-18, -66, 17) / -
<i>Temporal</i>			

Fusiform gyrus	770 / 444	4.8 (-36, -78, -11) / 4.4 (31, -64, -7)
Parahippocampal gyrus	207 / -	4.0 (-12, -45, 5) / -
<i>Parietal</i>		
Precuneus	3763 / 2400	4.9 (-13, -71, 27) / 5.4 (13, -48, 55)
Postcentral gyrus	385 / 1304	3.7 (-15, -52, 65) / 4.1 (30, -44, 62)
Inferior parietal lobule	1037 / -	4.3 (-39, -46, 38) / -
Superior parietal lobule	444 / 356	4.0 (-9, -63, 57) / 4.1 (21, -47, 58)
<i>Occipital</i>		
Lingual gyrus	2548 / 1037	5.1 (-9, -71, -1) / 4.3 (31, -69, -7)
Cuneus	1630 / -	5.1 (-12, -74, 30) / -
Middle occipital gyrus	1007 / 296	5.0 (-37, -82, -9) / 3.9 (37, -69, -10)
Inferior occipital gyrus	770 / -	5.1 (-34, -82, -11) / -
<i>Cerebellum</i>		
Declive	1867 / 1126	4.3 (-19, -62, -21) / 4.0 (33, -62, -11)
Culmen	1067 / 919	4.3 (-22, -59, -22) / 4.1 (4, -52, -15)
Pyramis	711 / 356	4.2 (-10, -70, -23) / 4.0 (16, -71, -27)

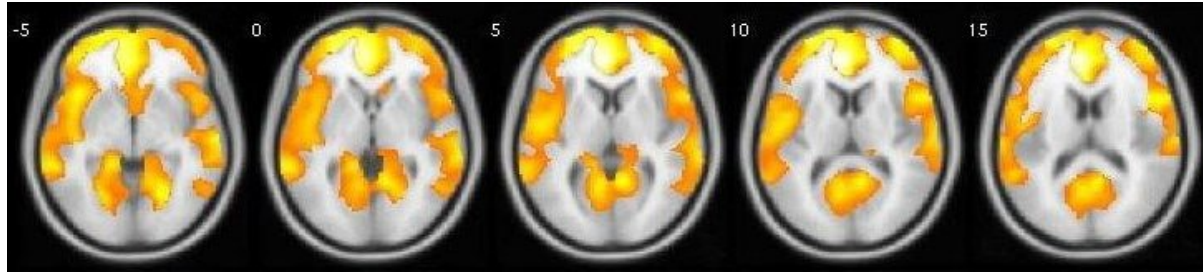
	Uvula	563 / -	4.2 (-19, -67, -23) / -
Probands with Schizophrenia	<i>Insular</i>	- / 593	- / 4.8 (36, -28, 19)
	<i>Parahippocampal gyrus</i>	444 / -	4.0 (-25, -5, -17) / -
Lifetime Duration of Psychosis			
Probands with Schizoaffective Disorder	<i>Temporal</i>		
	BA21, sub-gyral gray matter	356 / -	4.5 (-31, -14, -8) / -
	<i>Basal ganglia</i>		
	Putamen	1333 / 563	4.3 (-28, -11, -7) / 3.8 (6, -3, -6)
	Lentiform nucleus	919 / 444	4.4 (-13, 6, -3) / 4.1 (18, 9, 4)
	<i>Thalamus</i>	859 / -	4.5 (-13, -23, 7) / -

* Coordinates for peak *t* values are reported based of Group ICA for fMRI Toolbox, GIFT1.3i.

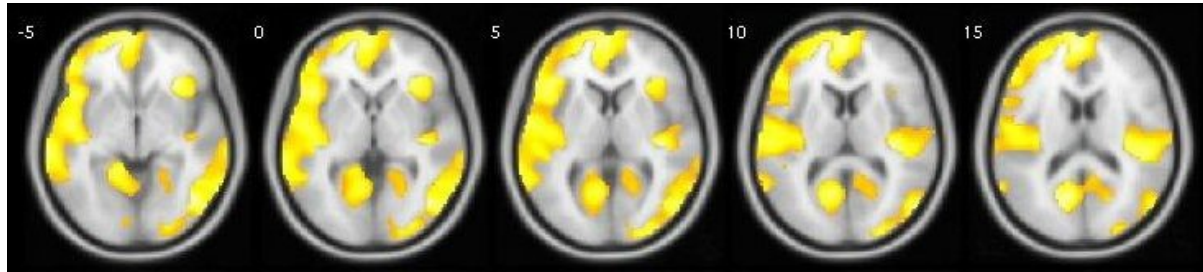
BA – Brodmann area

Figure S1. Regional gray matter volume reductions in probands with schizophrenia as compared to healthy controls across the B-SNIP sites

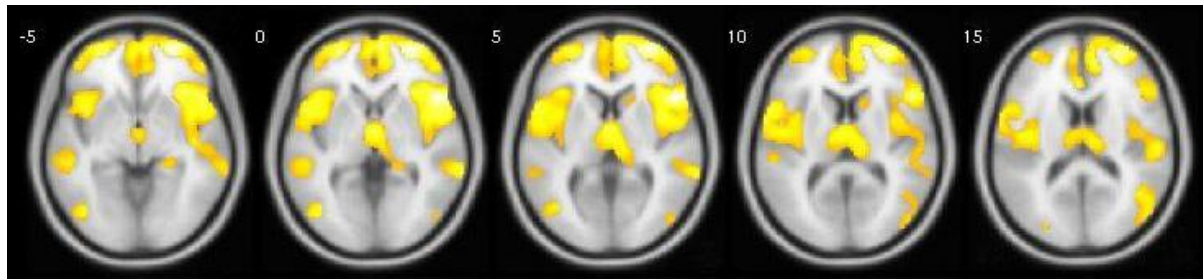
Site 1



Site 2



Site 3



Site 4

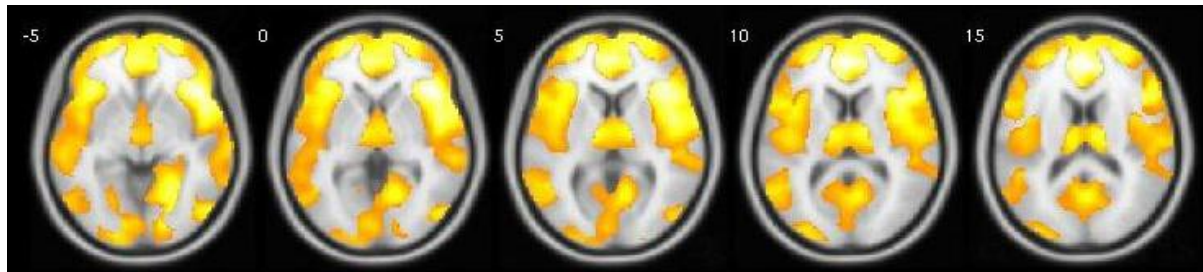


Figure S2. Illustrative analysis defining the optimal statistical threshold: $p < .005$, False Discovery Rate-corrected, $k=200$ voxels

