TABLE S1. Main findings from recent fMRI studies in adults with BD versus healthy adults

Main Theme	Authors and date	Study participants	Paradigm, dependent measures	Main Results
Decreased vlPFC activity during emotion processing emotion regulation, and response inhibition.	Altshuler et al., 2008. (15)	11 BDI depressed and 17 healthy adults.	Emotional face (versus shape) matching. Wholebrain BOLD signal change.	Decreased activity in bilateral vlPFC and right dlPFC, and increased activity in left OFC, in BDI depressed versus healthy adults.
	Foland et al., 2008. (19)	9 BDI manic, 9 healthy adults.	Emotional face (versus shape) matching and emotion labeling. Wholebrain BOLD signal change. Psychophysiological interaction (PPI) analysis to examine functional connectivity between amygdala (seed region) and vlPFC and wholebrain (target region) to emotion labeling vs. emotion perception.	Decreased activity in vlPFC to emotion matching and emotion labeling in BDI manic versus healthy adults. Increased activity in amygdala to both stimulus contrasts in BDI manic versus healthy adults. Decreased inverse functional connectivity between bilateral vlPFC and left amygdala to emotion labeling vs. emotion perception in BDI manic versus healthy adults.

	Strakowski et al., 2011. (16)	40 BDI manic and 36 healthy adults.	Continuous performance task with negative emotional and neutral picture distracters. Region of interest (vlPFC, rostral ACC, amygdala, visual cortex/fusiform gyrus), and wholebrain, BOLD signal change.	Decreased activity in bilateral vlPFC and left amygdala to all conditions in BDI manic versus healthy adults. Decreased activity in left vlPFC, right rostral ACC, left fusiform gyrus and right amygdala to emotional and neutral distracters in BDI manic versus healthy adults.
	Foland-Ross et al., 2012. (13)	24 BDI euthymic and 26 healthy adults.	Emotional face (versus shape) matching, and emotional face labeling. Region of interest (vlPFC, amygdala), and wholebrain, BOLD signal change.	Decreased activity in right vlPFC, insula putamen, thalamus and visual cortex/ lingual gyrus to "label emotions" versus "match shapes" in BDI euthymic versus healthy adults.
	Townsend et al., 2012. (17)	32 BDI euthymic and 30 healthy adults.	Go/NoGo response inhibition. Wholebrain BOLD signal change.	Decreased activity in bilateral vlPFC, left dlPFC, and bilateral putamen, caudate, globus pallidus, right thalamus and right subthalamic nucleus to NoGo versus Go in BDI euthymic versus healthy adults.
	Townsend et	30 BDI euthymic and 26	Emotion regulation	Decreased activity

	al., 2013. (14)	healthy adults.	paradigm with passive viewing and emotion downregulation conditions. Amygdala region of interest and wholebrain BOLD signal change. Functional connectivity (psychophysiological interaction) with amygdala seed region.	in bilateral vlPFC, insula, dlPFC, dorsal ACC, posterior cingulate cortex, pre-supplementary motor cortex, right inferior parietal cortex, bilateral middle temporal cortex, bilateral visual cortex/lingual gyri, bilateral caudate, and right thalamus. Decreased inverse functional connectivity between left amygdala and left vlPFC, left visual cortex/occipital gyrus, and right posterior cingulate cortex in BDI euthymic versus healthy adults.
	Delvecchio et al., 2012. (18)		Meta-analysis (Activation Likelihood Estimation) of 20 neuroimaging studies of BD, and/or MDD, versus healthy adults during face emotion processing.	Increased activity in limbic regions (parahippocampal gyrus, amygdala) in both BD and MDD versus healthy adults. Decreased vlPFC activity in BD, and decreased sensorimotor cortical activity in MDD, adults.

Increased amygdala, striatal and medial prefrontal cortical activity to emotional stimuli, especially to positive emotional stimuli. Decreased connectivity between prefrontal cortex and amygdala to positive emotional stimuli.	Almeida et al., 2009. (22)	15 BDI depressed, 16 MDD depressed, 16 healthy adults.	Emotion labeling happy and sad facial expressions. Effective connectivity examined using Dynamic Causal Modeling (DCM) between OFC and amygdala.	Decreased (left OFC-amygdala, and right amygdala-OFC positive connectivity to happy faces in BDI depressed versus healthy adults. Abnormal inverse left OFC-amygdala connectivity to happy faces in MDD depressed versus healthy adults.
	Surguladze et al., 2010. (21)	20 BDI remitted, 20 unaffected first degree relatives, and 20 healthy adults.	Implicit face emotion processing: Intense and mild happy and neutral, and intense and mild fear and neutral face gender labeling. Wholebrain and region of interest (amygdala) BOLD signal change.	Increased left amygdala activity to intense happy faces in BDI remitted adults and relatives versus healthy adults. Increased bilateral mdPFC activity to intense and mild fear and happy faces in BDI remitted adults and relatives versus healthy adults. Increased left putamen activity to mild fear faces in BDI

				remitted adults and relatives, and to intense happy faces in BDI remitted adults, versus healthy adults.
	Keener et al., 2012. (20)	27 BDI euthymic and 27 healthy adults.	Implicit face processing: labeling a color flash superimposed on dynamic facial expressions and dynamic face identity morphs. Wholebrain and region of interest (amygdala) BOLD signal change to dynamic face expressions (and face identity morphs) versus a shape morph control condition.	Increased bilateral amygdala activity to all face emotional stimuli, and increased activity in right amygdala and right mdPFC to face identity morphs in BDI euthymic versus healthy adults. Increased right dorsal ACC and right amygdala activity to happy faces , and increased left amygdala activity to sad faces, in BDI euthymic versus healthy adults.
Increased amygdala, OFC and temporal cortical activity during non-emotional, cognitive task performance.	Kaladjian et al., 2009. (28)	10 BDI manic, 10 healthy adults. BDI manic adults scanned again in remission. Healthy adults scanned again after a similar time interval to BDI manic adults.	Go/NoGo response inhibition paradigm. Wholebrain BOLD signal change to NoGo versus Go stimuli (correct trials).	Decreased left amygdala activity in BDI adults to NoGo versus Go stimulus contrast during remission (time 2) versus mania (time 1). No change in left amygdala activity over time in healthy adults.

				Decreased left amygdala activity at time 2 in BDI remitted versus healthy adults. Decreased bilateral putamen activity in BDI versus healthy adults at both time points.
	Gruber et al., 2010. (25)	18 BDI euthymic, 18 healthy adults.	Verbal delayed matching to sample paradigm performed during: 1. articulatory rehearsal; and 2. nonarticulatory phonological memory strategy. Wholebrain BOLD signal change to each condition (1. And 2.) versus respective control conditions (letter case judgment).	Increased right amygdala, right precentral gyrus, right intraparietal cortex, right cerebellar, and right frontal eye field activity during articulatory rehearsal in BDI manic versus healthy adults.
	Fleck et al., 2011. (27)	8 BDI mixed mood episode, 10 BDI depressed, 10 healthy adults.	Go/NoGo paradigm. Region of interest mask (vlPFC, caudate, putamen, globus pallidus, thalamus, amygdala, cerebellar vermis), and wholebrain BOLD signal change to the combination of all trial types: correctly rejected NoGo trials,	Increased right amygdala , right lateral prefrontal cortex, left OFC in BDI mixed mood episode versus healthy adults. Increased left thalamus and right vlPFC activity in BDI mixed mood episode versus BDI depressed adults.

			omission and commission errors, versus Go trial baseline.	
	Fleck et al., 2012. (26)	50 BDI manic/mixed mood episode and 34 healthy adults.	Continuous Performance Test-Identical Pairs paradigm. Region of interest mask (vlPFC, caudate, putamen, globus pallidus, thalamus, amygdala, cerebellar vermis, and dlPFC), and wholebrain, BOLD signal change to correct rejections versus the combination of hits, misses and false alarms over three time periods during the paradigm.	Increased bilateral amygdala activity, and progressively decreased striatal and thalamic activity over time, in BDI versus healthy adults.
	Cremaschi et al., 2013. (24)	Review of eight original fMRI studies (from 2004-December, 2012).	Working memory (WM) N-back task performance in BDI euthymic versus healthy adults.	Loss of functional connectivity in prefrontal cortical regions subserving WM, together with increased activity in dlPFC, vlPFC, parietal and temporal cortices, during WM N-back task performance in BDI euthymic versus healthy adults.
Increased left	Abler et al.,	12 BDI manic, 12	Monetary incentive	Absence of

vlPFC and OFC, and VS, activity during reward processing.	2008. (45)	schizophrenia/ schizoaffective disorder, and 12 healthy adults.	task. Wholebrain and region of interest (VS, ventral tegmental area) BOLD signal change.	bilateral VS and ventral tegmental area activity to expectation of high versus no reward, and to receipt versus omission of reward, in manic BDI adults. Decreased bilateral VS activity to receipt versus omission of reward in BDI manic versus healthy adults.
	Bermpohl et al., 2010. (42)	15 BDI manic and 26 healthy adults. 7 manic adults scanned on a second occasion when in remission.	Monetary incentive delay. Wholebrain BOLD signal change, followed by region of interest analyses in left vlPFC and bilateral VS to cued incentive magnitude, valence, and expected value (magnitude x valence interaction).	Increased activity in left vlPFC and left OFC to expected value in BDI manic versus healthy adults. BDI remitted adults did not differ from healthy adults on activity in these regions to expected value.
	O'Sullivan et al., 2011. (44)	12 subclinical hypomanic adults and 12 healthy adults. Subclinical hypomania assessed using the Hypomanic Personality Scale.	Reinforcement learning. Wholebrain and region of interest (basal ganglia)BOLD signal change to cues, outcomes, and prediction error.	Increased striatal activity to reward cues and positive prediction errors in subclinical hypomanic versus healthy adults. Increased activity in medial temporal cortex to reward and neutral cues in subclinical

				hypomanic versus healthy adults.
	Linke et al., 2012. (43)	19 euthymic BDI and 19 healthy adults; 22 unaffected relatives of BDI and 22 healthy adults.	Probabilistic reversal learning. Region of interest (OFC, vlPFC, amygdala, ACC, striatum) BOLD signal change.	Increased left OFC activity to reward outcomes , increased left OFC, right vlPFC, right dorsal ACC, right amygdala, bilateral putamen to rule reversal, in BDI euthymic versus healthy adults. Increased right OFC, right amygdala activity to reward outcomes, increased left OFC activity to loss outcomes (no shift), and increased right OFC and bilateral amygdala activity to rule reversal in relatives versus healthy adults.
	Nusslock et al., 2012. (40)	21BDI euthymic and 20 healthy adults.	Card guessing paradigm. Region of interest (OFC, vlPFC, VS) and wholebrain BOLD signal change to reward and loss anticipation and to reward and loss outcomes.	Increased left vlPFC activity to reward anticipation in BDI euthymic versus healthy adults (wholebrain analyses). Increased right OFC and right amygdala activity to reward anticipation in BDI

				euthymic versus healthy adults (region of interest analyses).
	Chase et al., 2013 (41)	23 BDI depressed, 40 depressed MDD and 37 healthy adults.	Card guessing paradigm. Region of interest BOLD signal change (ACC and VS to reward anticipation; vlPFC to reward and loss anticipation; VS to prediction error). Exploratory wholebrain BOLD signal change.	Increased left vlPFC activity to reward and loss anticipation in BDI depressed versus MDD depressed and healthy adults. Decreased ACC activity to reward anticipation in BDI depressed and MDD depressed versus healthy adults.

TABLE S2. Main findings from recent structural neuroimaging findings of adults with BD versus healthy adults

Main theme	Authors and date	Study participants	Methods	Main Findings
Decreased gray matter volume, decreased white matter volume, and decreased cortical thickness in prefrontal, anterior temporal and insula cortices. Decreased gray matter volume in particular in right vlPFC and OFC.	Scherk et al., 2008. (59)	35 BDI, 32 healthy adults.	Wholebrain voxel-based morphometry.	No between group differences in gray or white matter volumes.
	Almeida et al., 2009. (55)	17 BDI euthymic, 10 BDI depressed, 28 healthy adults.	Wholebrain voxel-based morphometry.	Decreased gray matter volume in bilateral OFC in all BD versus healthy adults.
	Kalmar et al., 2009. (62)	10 BDI (9 in mood episode, 1 euthymic), 8 healthy adolescents/young adults.	Wholebrain voxel-based morphometry. A second, follow-up scan performed 2-3 years after the first scan.	Greater decreases in gray matter volume in BDI versus healthy young adults in bilateral prefrontal cortices, including left mdPFC, dlPFC, rostral ACC and OFC, and right mdPFC and dlPFC; and in right temporal and left superior parietal

				cortices. Greater increases in gray matter volume in BDI versus healthy young adults in left primary visual cortex, bilateral cerebellum. Grater increases in white matter volume in BDI versus healthy young adults in bilateral periventricular white matter, and in right parietal cortex.
	Moore et al., 2009. (63)	27 BDI/BDII euthymic/ depressed adults. All treated with lithium in a controlled trial setting.	Wholebrain, prefrontal cortex, and subgenual ACC voxel-based morphometry. A second, follow-up scan performed after four weeks of lithium treatment to examine the effect of lithium on gray matter volume.	Increase in total brain gray matter volume after lithium treatment (in 9/10 lithium responders, and in 11/17 non responders). Increase in prefrontal cortical gray matter volume only in lithium responders. Trend-level increase in left subgenual ACC gray matter volume in lithium responders.
	Nery et al., 2009. (61)	28 BDI/BDII adults (18 euthymic, 10	Region of interest analysis by manual	Decreased OFC gray matter

		depressed), 28 healthy adults.	tracing of OFC volume.	volume in depressed versus euthymic BDI/BDII adults.
	Stanfield et al., 2009. (49)	66 BDI, 66 healthy adults.	Wholebrain voxel-based morphometry.	Decreased gray matter in bilateral vlPFC in BDI versus healthy adults.
	van der Schot et al., 2009. (52)	50 euthymic affected twin pairs with BDI/BDII/BD NOS (9 monozygotic concordant, 15 monozygotic discordant, 4 dizygotic concordant, 22 dizygotic discordant), 67 healthy twin pairs (39 monozygotic, 28 dizygotic).	Wholebrain , frontal, parietal, temporal, occipital cortical, quantitative assessments	Decreased total cortical gray and white matter volume in BD versus unaffected twins and healthy adults. Decreased white matter volume associated with genetic risk for BD.
	Rimol et al., 2010. (65)	139 BD (87 BDI, 52 BDII) and 207 healthy adults. (173 schizophrenic adults also included in the study).	Wholebrain cortical thickness, and region of interest subcortical volume analyses.	Decreased cortical thickness in frontal, superior temporal and temporoparietal cortices in the subgroup of BD adults with BDI versus healthy adults.
	Tost et al., 2010. (54)	42 BDI, 42 healthy adults.	Wholebrain, voxel-based morphometry.	Decreased total gray matter volume in BDI versus healthy adults. Decreased left middle

				temporal cortical gray matter in BDI versus healthy adults. Widespread decreases in gray matter in temporal cortex, dlPFC, vlPFC in BDI adults with persecutory delusions versus healthy adults. Decreased left dlPFC and left mPFC in BDI adults with, versus those without, persecutory delusions.
	van der Schot et al., 2010. (51)	49 affected twin pairs with BDI/BDII/BD NOS (9 monozygotic concordant, 14 monozygotic discordant, 4 dizygotic concordant, 22 dizygotic discordant), 67 healthy twin pairs (39 monozygotic, 28 dizygotic).	Wholebrain voxel-based morphometry.	Decreased gray matter in right dlPFC, right OFC, right insula, and decreased frontal white matter, associated with genetic risk for BD.
	Foland-Ross et al., 2011 (64)	34 BDI euthymic , 31 healthy adults.	Wholebrain voxel-based morphometry. Cortical thickness measurement.	Decreased cortical thickness in bilateral OFC, dlPFC and left rostral/dorsal ACC in BDI versus healthy adults.

				Cortical thinning more evident in BDI adults with a history of psychosis.
	Haller et al., 2011. (56)	19 BD (11 BDI, 8 BDII) euthymic, 47 healthy elderly adults.	Wholebrain voxel-based morphometry. Wholebrain and region of interest (prefrontal cortices and basal ganglia).	Decreased gray matter in right OFC and right anterior insula in BDI versus healthy adults.
	Matsuo et al., 2012. (50)	35 BDI, 20 unaffected first-degree relatives of BDI, 40 healthy adults.	Wholebrain voxel-based morphometry.	Decreased left anterior insula gray matter volumes in BDI adults and relatives versus healthy adults. Decreased right vlPFC gray matter volume in BDI versus healthy adults. Decreased right mdPFC white matter volumes in relatives versus healthy adults.
	Selvaraj et al., 2012. (53)		Meta-analysis of eight wholebrain voxel-based morphometry studies in BDI (different subtypes; different mood states) versus healthy adults.	Decreased gray matter volume in right OFC, right insula, and right temporal cortex in BD versus healthy adults.

	Hajek et al., 2013. (60)	Two studies: 1. 19 BD (16 BDI, 3 BDII) adults in early stages of illness, 50 unaffected relatives, 36 affected relatives, 49 healthy adults. 2. 17 lithium-treated BD (11 BDI, 6 BDII), 12 non-lithium-treated BD, 11 healthy adults.	Modulated wholebrain voxel-based morphometry.	Increased right vlPFC gray matter volume in BD adults in early stages of illness, affected and unaffected relatives versus healthy adults. Decreased right vlPFC gray matter volume in non-lithium-treated versus healthy adults. No changes in right vlPFC gray matter volumes in lithium-treated BD versus healthy adults.
Decreased volume of amygdala and hippocampus. Altered striatal volumes.	Foland et al., 2008. (68)	49 BDI adults (different mood states): 37 lithium-free, 12 lithium-treated.	Region of interest (amygdala, hippocampus) volumetric analysis.	Increased left amygdala and bilateral hippocampal volumes in lithium-treated versus lithium-free BDI adults.
	Pfeifer et al., 2008. (69)		Meta-analysis of 11 studies examining amygdala volumes in youth, adolescents and adults with BD.	Decreased amygdala volumes in BD versus healthy youth and adolescents, but not in BD versus healthy adults.
	Almeida et al., 2009. (55)	17 BDI euthymic, 10 BDI depressed, 28 healthy adults.	Wholebrain voxel-based morphometry.	Decreased gray matter volume in left parahippocampal

				gyrus and left putamen in all BD versus healthy adults.
	Javadapour et al., 2010. (72)	24 BDI, 24 healthy adults.	Region of interest (hippopcampal) volumetric analyses, using manual tracing.	Increased right hippocampal volumes in BDI versus healthy adults. Increased left hippocampal volumes in BDI adults with ≤10 years' illness duration, or ≤10 affective episodes versus healthy adults. A negative association in BDI adults between number of affective episodes and left hippocampal volumes.
	Rimol et al., 2010. (65)	139 BD (87 BDI, 52 BDII) and 207 healthy adults. (173 schizophrenic adults also included in the study).	Wholebrain cortical thickness, and region of interest subcortical volume analyses.	Decreased bilateral hippocampal, left thalamus and right VS volumes in BD versus healthy adults.
	Haller et al., 2011. (56)	19 BD (11 BDI, 8 BDII) euthymic, 47 healthy elderly adults.	Wholebrain voxel-based morphometry. Wholebrain and region of interest (prefrontal cortices	Decreased gray matter in right caudate, right VS, and right ventral putamen in BDI versus healthy

			and basal ganglia).	adults.
	Hallahan et al., 2011. (71)	321 BDI, 442 healthy adults.	Mega-analysis from 11 research groups comparing regional brain volumes in BDI versus healthy adults.	Increase left temporal cortical, right putamen and right lateral ventricular volumes in BDI versus healthy adults. Increased hippocampal and amygdala volumes in lithium-treated versus non-lithium-treated BDI adults and healthy adults.
	Lisy et al., 2011. (74)	58 BDI, 48 healthy youth and adults. Rescanned after 3-34 months.	Wholebrain voxel-based morphometry.	Increases in gray matter in bilateral amygdala, bilateral parahippocampal gyri, right basal ganglia, and left superior temporal cortex in all BDI versus healthy individuals.
	Foland-Ross et al., 2012. (67)	28 BDI (12 depressed; 16 euthymic), 12 healthy adults.	Region of interest (amygdala) volumetric analyses, using manual tracing.	Decreased amygdala volumes in depressed BDI versus euthymic BDI and healthy adults.
	Ivleva et al., 2012 (58)	19 schizophrenic, 16 schizoaffective disorder, 17 psychotic BDI, and 10 healthy adults.	Wholebrain voxel-based morphometry, and semi-automated regional parcellation.	Decreased cortical gray matter , in particular in fronto-temporal regions, regions, in schizophrenic versus healthy

				adults; similar gray matter reductions in schizoaffective disorder versus healthy adults; no differences in gray matter volume in BDI versus healthy adults.
	Ong et al., 2012. (73)	27 BDI, 24 healthy adults.	Region of interest analysis (caudate nucleus), using manual tracing.	Decreased volume along the ventromedial surface of the caudate nucleus in BDI versus healthy adults.
	Ivleva et al., 2013 (57)	351 individuals with psychosis (146 with schizophrenia, 90 with schizoaffective disorder, 115 with psychotic BDI); 369 of their first-degree relatives (134 relatives of individuals with schizophrenia, 106 relatives of individuals with schizoaffective disorder, 129 relatives of individuals with psychotic bipolar I disorder); and 200 healthy comparison	Wholebrain gray matter analysis.	Individuals with psychosis and relatives with psychosis spectrum disorders (n=34) showed gray matter volume reductions across the cortex. Individuals with schizophrenia and those with schizoaffective disorder showed similar patterns of cortical and subcortical gray matter reductions. Psychotic BDI individuals showed more limited gray matter voume

		individuals.		reductions in frontotemporal cortex versus healthy individuals.
	Wijeratne et al., 2013. (66)	18 euthymic BDI and 21 healthy older adults.	Region of interest (amygdala, hippocampus) volumetric analyses using manual tracings.	Decreased bilateral hippocampal and right amygdala volumes in BDI versus healthy adults.

TABLE S3. Main findings from recent diffusion imaging studies of adults with BD versus healthy adults

Main theme	Authors and date	Study participants	Method	Main findings
Altered fractional anisotropy (FA), and increased radial diffusivity (RD), in frontally-situated white matter.	Bruno et al., 2008. (89)	36 BDI, 28 healthy adults.	Diffusion tensor imaging. Wholebrain, voxel-based analysis.	Increased mean diffusivity in right posterior frontal and bilateral frontal white matter, and decreased FA in temporal and occipital regions, in BD versus healthy adults.
	Versace et al., 2008. (81)	31 BDI (16 remitted, 14 depressed, 1 subthreshold depressive symptoms), 25 healthy adults.	Diffusion tensor imaging, Tract-Based Spatial Statistics (TBSS), focusing on wholebrain white matter skeleton.	Decreased FA, and increased RD, in right uncincate fasciculus in BD versus healthy adults. Increased FA, and reduced RD/ increased longitudinal diffusivity, in left uncinate fasciculus and left optic radiation in BD versus healthy adults. Increased FA in right anterior thalamic radiation in BD versus healthy adults.
	Wang et al., 2008. (84)	42 BD (type not specified; 11 manic/mixed mood episode, 9 depressive episode, 22 euthymic), 42 healthy adults.	Diffusion tensor imaging. Region of interest: cingulum bundle, anterior and posterior subsections.	Decreased anterior cingulum FA in BD versus healthy adults.
	Wang et al., 2008. (85)	33 BD (type not specified), 40 healthy adults.	Diffusion tensor imaging. Region of interest: corpus callosum, anterior, middle and posterior subsections, and	Decreased FA in anterior and middle corpus callosum in BD versus healthy adults (region of interest); decreased FA in genu, rostral

			voxel-based analysis.	body, and anterior midbody of corpus callosum in BD versus healthy adults.
	Chaddock et al., 2009. (90)	19 psychotic BDI adults, 21 psychotic disorder-unaffected first degree relatives of BD individuals, 18 healthy adults.	Diffusion tensor imaging. Wholebrain, voxel-based analysis.	Decreased FA in the genu of the corpus callosum, right inferior longitudinal fasciculus and left superior longitudinal fasciculus, in BD versus healthy adults. Increasing genetic liability for BD associated with widespread decreases in FA in BD adults and relatives versus healthy adults.
	Mahon et al., 2009. (97)	30 BD (25 BDI, 2 BDII, 3 BDNOS), 38 healthy adults.	Diffusion tensor imaging. Wholebrain, voxel-based analysis. Tractography performed on clusters differing significantly between groups.	Increased FA in in bilateral frontal white matter, decreased FA in left cerebellar white matter, in BD versus healthy adults. Clusters corresponded to pontine crossing, corticospinal, corticopontine, and thalamic radiation tracts.
	Wessa et al., 2009. (96)	22 BDI/II remitted, 21 healthy adults.	Diffusion tensor imaging. Wholebrain, voxel-based analysis.	Increased FA in medial frontal, precentral inferior parietal and occipital white matter.
	Zanetti et al., 2009. (93)	37 BDI (21 remitted, 16 depressed), 26 healthy adults.	Diffusion tensor imaging. Wholebrain, voxel-based analysis	Decreased FA, increased mean diffusivity, in bilateral prefronto-limbic-striatal and right inferior

				fronto-occipital white matter (right superior and right inferior longitudinal fasciculi) in BDI versus healthy adults, and in depressed BDI versus remitted BDI and healthy adults. Increased FA in bilateral OFC (uncinate and inferior fronto-occipital fasciculi) in depressed BDI versus remitted BDI and healthy adults.
	Chan et al., 2010. (98)	16 BDI remitted first episode mania, 16 healthy adults.	Diffusion tensor imaging, TBSS, focusing on wholebrain white matter skeleton.	Decreased FA, increased RD, in left anterior frontal white matter, right posterior thalamic radiation, left cingulum, bilateral striatum, and increased RD in corpus callosum in BDI versus healthy adults.
	Macritchie et al., 2010. (101)	28 BD (20 BDI, 8 BDII), 28 healthy adults.	Diffusion tensor imaging. Region of interest analysis: corpus callosum (genu, body, splenium) and deep/periventricular map (prefrontal deep white matter, periventricular—adjacent to anterior horn of lateral ventricles, central—centrum semiovale, occipital regions).	Decreased FA in all corpus callosal and occipital white matter, increased mean diffusivity in prefrontal and periventricular white matter, in BD versus healthy adults.
	Mahon et al., 2010. (83)		Critical review of neuroimaging studies examining	Abnormalities in prefrontal white matter, in particular

			white matter in BD.	in white matter tracts connecting prefrontal cortical with subcortical regions.
	van der Schot et al., 2010. (51)	49 affected twin pairs with BDI/BDII/BD NOS (9 monozygotic concordant, 14 monozygotic discordant, 4 dizygotic concordant, 22 dizygotic discordant), 67 healthy twin pairs (39 monozygotic, 28 dizygotic).	Wholebrain voxel-based morphometry.	Decreased FA in bilateral superior longitudinal fasciculi associated with genetic risk for BD.
	Versace et al., 2010. (92)	15 BDI depressed, 16 MDD depressed, 24 healthy adults.	Diffusion tensor imaging, Tract-Based Spatial Statistics (TBSS), focusing on wholebrain white matter skeleton.	Decreased FA, increased RD and decreased longitudinal diffusivity, in left superior longitudinal fasciculus in BDI depressed versus MDD depressed and healthy adults. Decreased FA in right uncinate fasciculus in BDI depressed versus healthy adults. Decreased FA in left inferior longitudinal fasciculus in MDD depressed versus healthy adults.
	Benedetti et al., 2011. (86)	15 BDI remitted, 15 MDD remitted, 21 healthy adults.	Diffusion tensor imaging. Probabilistic tractography to reconstruct a priori white matter tracts between prefrontal and posterior	Decreased FA, increased mean diffusivity, RD, in the majority of WM tracts connecting prefrontal-subcortical regions in BDI versus MDD

			cingulate cortices, amygdala and insula.	and healthy adults.
	Benedetti et al., 2011. (87)	40 BDI depressed, 21 healthy adults.	Diffusion tensor imaging, Tract-Based Spatial Statistics (TBSS), focusing on wholebrain white matter skeleton.	Decreased FA in the genu of the corpus callosum, anterior, superior-posterior corona radiate in BDI versus healthy adults. Increased RD in corpus callosum, right mid-dorsal cingulum bundle, left anterior and bilateral superior-posterior corona radiate, bilateral superior longitudinal fasciculi, and right posterior thalamic radiation, in BDI versus healthy adults.
	Cui et al., 2011. (99)	18 BDI psychotic manic, 25 paranoid schizophrenic, 30 healthy adults.	Diffusion tensor imaging. Wholebrain voxel-based analysis.	Decreased FA in left frontal parietal white matter (posterior corona radiata) in all patients versus healthy adults. Decreased FA in right frontal white matter (anterior thalamic radiation) in BDI versus healthy adults.
	Haller et al., 2011. (56)	19 BD (11 BDI, 8 BDII) euthymic, 47 healthy elderly adults.	Wholebrain voxel-based morphometry. Wholebrain and region of interest (prefrontal cortices and basal ganglia).	Decreased FA in ventral corpus callosum in BD versus healthy adults.
	Lu et al., 2011. (100)	13 first episode psychotic BDI, 21 schizophrenic, 18 healthy adults.	Diffusion tensor imaging. Wholebrian, voxel-based analysis.	Decreased FA, and increased RD, in multiple tracts in BDI versus healthy

				adults. Decreased FA, and increased RD, in cingulum, internal capsule, and multiple posterior white matter regions in BDI versus schizophrenic adults.
	Sprooten et al., 2011. (94)	117 healthy, unaffected relatives of BD adults, 79 healthy adults. Cyclothymic temperament measured using the cyclothymia scale of the Temperament Evaluation of Memphis, Pisa and San Diego questionnaire.	Diffusion tensor imaging, Tract-Based Spatial Statistics (TBSS), focusing on wholebrain white matter skeleton, and wholebrain voxel-based analyses of FA.	Decreased FA in one large, widespread cluster in unaffected relatives versus healthy adults. Cyclothymic temperament inversely correlated with FA in bilateral internal capsules and left temporal white matter.
	Emsell et al., 2013. (80)	35 BDI euthymic, 43 healthy adults.	Diffusion tensor imaging. Deterministic tractography, focusing on corpus callosum, cingulum and fornix.	Decreased FA in left fornix, increased mean diffusivity and RD in bilateral fornix, in BDI versus healthy adults. Decreased FA, increased mean diffusivity and RD, in corpus callosum in BDI versus healthy adults. Decreased FA, increased RD, in left subgenual cingulum, decreased FA and longitudinal diffusivity in right dorsal anterior cingulum, in BDI versus healthy adults.

	Leow et al., 2013 (95)	25 BDI euthymic, 24 healthy adults.	Diffusion tensor imaging. Deterministic tractography and global and local brain network measures.	Decreased FA in the genu, body and splenium of the corpus callosum in BDI versus healthy adults. Longer characteristic path length and lower clustering coefficient globally in BDI versus healthy adults. Longer node-level path length and lower clustering coefficient in a priori regions: left hippocampus, left vlPFC and bilateral cingulate cortex in BDI versus healthy adults. Longer inter-hemispheric path length and lower inter-hemispheric efficiency in BDI versus healthy adults.
	Linke et al., 2013 (91)	Sample 1: 19 BDI individuals and 19 healthy individuals Sample 2: 22 healthy first-degree relatives of individuals with BD, 22 healthy individuals with no family history of BD.	Diffusion tensor imaging, focusing on examination of FA and diffusivity in three tracts of interest. Both samples also performed the Intra-Extra Dimension Set Shift Task and the Cambridge Gambling Task.	Bothe BDI and healthy relates showed abnormally reduced FA in right anterior limb of internal capsule and right uncinate fasciculus. Only BDI individuals showed abnormally reduced FA in the corpus callosum. Reduced FA in the anterior limb of the internal capsule correlated with increased number of errors during set shifting and

				increased risk taking; reduced FA in the uncinate fasciculus correlated with increased risk taking.
	Mahon et al., 2013 (88)	26 BD (20 BDI, 6 BDII), 15 unaffected siblings of BD individuals, 27 healthy adults.	Diffusion tensor imaging, TBSS, focusing on wholebrain white matter skeleton. Probabilistic tractography to identify the white matter tracts in clusters from TBSS that differed significantly between groups.	FA in right temporal white matter differed among groups: BD<siblings<healthy adults. Probabilistic tractography revealed this abnormality to be in the right inferior occipital fasciculus.
	Versace et al., 2013. (82)	24 BDI euthymic, 19 healthy adults.	Diffusion tensor imaging, and probabilistic tractography focusing on ten frontally-situated white matter tracts.	Decreased FA in forceps major, cingulum, forceps minor, superior longitudinal fasciculus, and uncinate fasciculus in BDI versus healthy adults. Increased RD in forceps minor, cingulum, superior longitudinal fasciculus, and uncinate fasciculus in BDI versus healthy adults.