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Table E1. Representative Major Findings from Imaging Studies with Different Techniques in Psychiatric Disorders

Psychiatric Disorder and Study	No. of Subjects*	Imaging Technique	Main Findings in Patients
MDD			
Schmaal et al (12)	1728:7199	sMRI	Decreased hippocampal volume
van Eijndhoven et al (117)	40:31	sMRI	Decreased cortical thickness in the medial orbitofrontal cortex; increased cortical thickness in the temporal pole and the caudal anterior and posterior cingulate cortex
Salvadore et al (15)	85:107	sMRI	Decreased gray matter in the dorsal anterolateral, dorsomedial, and ventrolateral prefrontal cortex
Papmeyer et al (118)	111:93	sMRI	Decreased cortical thickness in the right parahippocampal and fusiform gyrus
Samann et al (119)	167:92	sMRI	Increased left hippocampal and bilateral posterior cingulate gray matter volumes; decreased right lateral temporal gray matter volume
Yucel et al (120)	65:93	sMRI	Decreased subgenual prefrontal cortex volumes.
Serra-Blasco et al (121)	66:32	sMRI	Decreased gray matter volume in right superior frontal gyrus, left cingulate gyrus, bilateral medial frontal gyrus, left insula, left inferior frontal gyrus, left parahippocampal gyrus, left transverse temporal gyrus, and left postcentral gyrus
Tae et al (122)	21:21	sMRI	Decreased hippocampal volume
Soriano-Mas et al (123)	70:40	sMRI	Decreased gray matter in the bilateral insula
Ahdidan et al (124)	24:33	sMRI	Decreased gray matter in the temporal lobes bilaterally, the medulla, and the right hippocampus
Swartz et al (125)	157:0	fMRI	Increased amygdala reactivity during adolescence, prior to the development of depression, as a function of familial risk or, in the absence of familial risk, stressful life events
Langenecker et al (126)	20:22	fMRI	Increased activation in frontal, limbic, and temporal regions during correct rejection of lures
Siegle et al (24)	14:21	fMRI	Decreased sustained reactivity in the subgenual cingulate cortex; increased sustained reactivity in the amygdala
Tao et al (127)	19:21	fMRI	Decreased activation in the amygdala, orbitofrontal cortex, and subgenual anterior cingulate cortex bilaterally
Arnone et al (128)	62:54	fMRI	Increased amygdala activation in response to sad facial emotions
Walsh et al (129)	20:20	fMRI	Decreased linear load-response in the dorsal anterior cingulate, left middle frontal, and lateral temporal cortices
Fu et al (130)	19:19	fMRI	Decreased activation in the left amygdala, ventral striatum, and frontoparietal cortex

Liu et al (30)	30:30	fMRI	Increased ALFF in the frontal cortex (including the bilateral ventral or dorsal anterior cingulate cortex, orbitofrontal cortex, premotor cortex, ventral prefrontal cortex, left dorsal lateral frontal cortex, and left superior frontal cortex), basal ganglia (including the right putamen and left caudate nucleus), left insular cortex, right anterior entorhinal cortex, and left inferior parietal cortex; decreased ALFF in the bilateral occipital cortex, cerebellum hemisphere, and right superior temporal cortex.
Jia et al (17)	52:52	DTI	Decreased fractional anisotropy in the left anterior limb of the internal capsule and in the right frontal lobe
Ma et al (16)	14:14	DTI	Decreased fractional anisotropy in the white matter of the right middle frontal gyrus, left lateral occipitotemporal gyrus, and subgyral and angular gyri of the right parietal lobe.
Schizophrenia			
Zhang et al (33)	25:33	sMRI	Decreased cortical thickness in the bilateral ventromedial prefrontal cortices, left superior temporal gyrus, and right pars triangularis; increased cortical thickness in the left superior parietal lobe
Xiao et al (22)	128:128	sMRI	Decreased cortical thickness, primarily in the bilateral prefrontal and parietal cortex; increased thickness in the bilateral anterior temporal lobes, left medial orbitofrontal cortex, and left cuneus.
Yao et al (131)	64:64	sMRI	Decreased white matter volume in the bilateral posterior limb of the internal capsule and right subgyral frontal white matter
Andreasen et al (132)	202:0	sMRI	Greater relapse duration is significantly associated with tissue loss in total cerebral volume and in the frontal lobe
Bodnar et al (53)	59:0 (42 nonremitted and 17 remitted patients)	sMRI	Decreased parahippocampal gray matter bilaterally in nonremitted patients
Ho et al (51)	211:0	sMRI	Longer follow-up correlated with smaller brain tissue volumes and larger cerebrospinal fluid volumes; more antipsychotic treatment was associated with smaller gray matter volumes.
Ren et al (31)	100:100	sMRI,fMRI	Decreased gray matter volume in the left paracentral and left inferior parietal lobules; increased gray matter volume in the left and right thalamus, anterior cingulate cortex, insula, and orbital frontal gyrus; decreased ALFF in the right inferior and left superior frontal gyrus, the medial frontal gyrus bilaterally, the inferior parietal lobule bilaterally, and the precuneus; increased ALFF in the putamen and occipital regions bilaterally
Lui et al (8)	68:68	sMRI,fMRI	Decreased gray matter volume in the right superior temporal gyrus, right middle temporal gyrus, and right anterior cingulate gyrus; no significant differences in the resting state functional connectivity of any of the three seed areas.
Lui et al (114)	34:34	fMRI	Decreased ALFF in the bilateral ventromedial frontal cortex at baseline; increased ALFF in the right caudate and left putamen after treatment
Huang et al (133)	66:66	fMRI	Decreased ALFF in the medial prefrontal lobe; increased ALFF in the left and right putamen
Wheeler et al (134)	128:130	fMRI	Increased frontoparietal and frontotemporal coupling

Ma et al (135)	28:28	fMRI	Decreased small-w orldness during both task and rest; the altered task-induced modulations to topologic measures of motor, cerebellum, and parietal regions
Voineskos et al (136)	77:79	sMRI, DTI	Disruption of w hite matter tracts at the right inferior longitudinal fasciculus, the right arcuate fasciculus, and the left uncinate fasciculus; decreased cortical thickness in bilateral left orbitofrontal cortex, the middle temporal gyrus, the temporal pole, the dorsolateral prefrontal cortex, the parietal operculum, the parahippocampal gyrus, the superior temporal gyrus, and the insula
Sun et al (108)	113:110	DTI	Tw o distinct patterns of white matter abnormalities exist at the early phase in different subtypes of schizophrenia
Szeszko et al (34)	10:13	DTI	Decreased fractional anisotropy in the left internal capsule and left hemisphere w hite matter of the middle frontal gyrus and posterior superior temporal gyrus
Mandl et al (35)	16:23	DTI	Decreased fractional anisotropy, mean diffusivity, and magnetization transfer ratio in the right uncinate fasciculus and left arcuate fasciculus
BD			
Najt et al (137)	35:37	sMRI	Increased volume contraction over time in a region, including the insula and orbitofrontal, rostral, and dorsolateral prefrontal cortices.
van Erp et al (138)	32:32	sMRI	Increased global hippocampal volume
Foland-Ross et al (139)	34:31	sMRI	Decreased gray matter in bilateral prefrontal cortex and left anterior cingulate cortex; additionally, thinning in these regions w as more pronounced in patients w ith a history of psychosis.
van der Schot et al (73)	234:134	sMRI	BD w as associated with a decrease in total cortical volume
Rimol et al (140)	139:207	sMRI	No cortical thinning in patients w ith BD as compared w ith that in control subjects; decreased cortical thickness primarily in the frontal lobes and superior temporal and temporoparietal regions
Savitz et al (141)	35:35	sMRI	Decreased bilateral amygdala volumes in unmedicated patients; there w as a trend toward greater amygdala volumes in medicated patients.
Nugent et al (57)	36:65	sMRI	Decreased gray matter in the posterior cingulate or retrosplenial cortex and superior temporal gyrus in unmedicated patients subjects relative to that in medicated subjects; decreased gray matter in the lateral orbital cortex in medicated subjects; increased white matter in the orbital and posterior cingulate cortices
Magioncalda et al (70)	40:40	fMRI	Decreased functional connectivity between perigenual anterior cingulate cortex and posterior default mode netw ork and in the salience netw ork.
Gruber et al (142)	18:18	fMRI	Only the patients exhibited activation of the right amygdala during the articulatory rehearsal task; there w as increased functional activation in the right frontal and intraparietal cortex and in the right cerebellum

Vizueta et al (143)	21:21	fMRI	Decreased activation in the left and right ventrolateral prefrontal cortices and right amygdala; decreased negative functional connectivity between the right amygdala and the right orbitofrontal cortex, as well as the right dorsolateral prefrontal cortex
Versace et al (144)	31:24	fMRI	Abnormally elevated left amygdala-orbitofrontal cortical functional connectivity to sad stimuli, together with abnormally reduced amygdala-orbitofrontal cortical functional connectivity to intense happy stimuli might represent a state marker of depression in patients with BD
Mechelli et al (145)	29:45	fMRI	The right posterior orbital gyrus expressed increased activation in individuals with the high-risk variant, but only in patients with BD
Wang et al (66)	33:31	fMRI, DTI	Decreased functional connectivity between the perigenual anterior cingulate cortex and amygdala; there was a significant positive association between perigenual anterior cingulate cortex and amygdala functional coupling and fractional anisotropy in ventrofrontal white matter
Leow et al (146)	25:24	DTI	Increased characteristic path length, lower clustering coefficient, and lower global efficiency; impaired interhemispheric but relatively preserved intrahemispheric integration
Versace et al (147)	31:25	DTI	Increased fractional anisotropy in the left orbitomedial prefrontal cortex Decreased fractional anisotropy in the right orbitomedial prefrontal cortex.
McIntosh et al (148)	45:49	DTI	Decreased fractional anisotropy in the uncinate fasciculus and anterior thalamic radiation.
Adler et al (62)	11:17	DTI	Decreased fractional anisotropy only in superior-frontal white matter tracts
ADHD			
Hoekzema et al (74)	18:0	sMRI	Increased gray matter in bilateral middle frontal cortex and right inferior-posterior cerebellum after cognitive training
He et al (75)	37:35	sMRI	Decreased gray matter volumes were identified in the right orbitofrontal cortex, right primary motor and premotor cortex, left anterior cingulate cortex, and left posterior midcingulate cortex
Hoekzema et al (149)	19:0	fMRI	Increased activity in the cerebellum, which correlated with improvement on in-imager measures of attention.
Morein-Zamir et al (78)	19:19	fMRI	Hypoactivation in right inferior frontal cortex is specifically associated with motor response inhibition
Kucyi et al (79)	23:23	fMRI	Cerebellar areas of the default mode network positive functional connectivity with widespread regions of salience, dorsal attention, and sensorimotor networks Increased functional connectivity of cerebellar default mode network areas with frontoparietal and visual network regions
Sripada et al (150)	275:481	fMRI	Default network ventral attention network interconnections are a key locus of dysfunction in patients with ADHD; distributed dysconnectivity within and between large-scale networks is present in patients with ADHD
Lei et al (151)	28:28	DTI	Abnormalities in the temporo-occipital areas, while the combined subtype is related to abnormalities in the frontal-subcortical circuit, frontolimbic pathway, and temporo-occipital areas
Silk et al (77)	15:15	DTI	Increased fractional anisotropy in regions underlying inferior parietal, occipitoparietal, inferior frontal, and inferior temporal cortex.

de Zeeuw et al (76)	30:34	DTI	There were no differences in fractional anisotropy or magnetization transfer ratio in total cerebral white matter
PTSD			
Chao et al (85)	55:0	sMRI	Duration was significantly associated with right hippocampal volume
Gezue et al (152)	25:25	sMRI	Decreased cortical thickness in bilateral superior and middle frontal gyri, left inferior frontal gyrus, and left superior temporal gyrus.
Kasai et al (153)	18:23	sMRI	Decreased gray matter density in right hippocampus, pregenual anterior cingulate cortex, and left and right insula
Woodward et al (154)	38:25	sMRI	Decreased anterior cingulate cortex volume
Corbo et al (155)	14:14	sMRI	Decreased gray matter density in the right pregenual anterior cingulate cortex and in the left insula
Wignall et al (84)	15:11	sMRI	Decreased right hippocampal volume
De Bellis et al (88)	28:66	sMRI	Decreased intracranial, cerebral, and prefrontal cortex; prefrontal cortical white matter; and right temporal lobe volumes and areas of the corpus callosum; increased frontal lobe cerebrospinal fluid volumes
Suo et al (156)	28:26	fMRI	Increase in the clustering coefficient and a normalized characteristic path length and local efficiency, suggesting a shift toward regular networks
Gong et al (95)	65:56	fMRI	Use of relevance vector regression can enable prediction of the clinical scores of PTSD, particularly in frontal and parietal areas bilaterally, as well as in the cingulate, cerebellar, and subcortical regions
Shang et al (98)	18:20	fMRI	Patients with PTSD have functional alterations in the somatomotor network, auditory network, and visual network
Lui et al (99)	44:32	fMRI	Increased regional activity in frontolimbic and striatal areas; decreased connectivity among limbic and striatal networks in patients who had recently experienced severe emotional trauma.
Shin et al (101)	12:12	fMRI	Increased responsivity in the dorsal anterior cingulate appears to be a familial risk factor for the development of PTSD after psychologic trauma
Lanius et al (91)	9:9	fMRI	Decreased activation of the thalamus, anterior cingulate gyrus, and medial frontal gyrus
Lei et al (90)	27:24	DTI	Pediatric PTSD is accompanied by a connectivity disequilibrium between the salience and default-mode networks
Autism spectrum disorder			
Hadjikhani et al (157)	10:7	sMRI, fMRI	Decreased activation in the right amygdala, inferior frontal cortex, superior temporal sulcus, and face-related somatosensory and premotor cortex; the severity of social symptoms was correlated with the right inferior frontal cortex cortical thickness and with functional activation in that area
Murdaugh et al (158)	31:22	fMRI	Increased connectivity between the Broca area and the right superior temporal gyrus, as well as the Wernicke area and left inferior frontal gyrus
Lai et al (159)	12:15	fMRI	Decreased activation within the superior temporal gyrus during passive speech stimulation
Lombardo et al (160)	33:33	fMRI	Decreased functional connectivity between ventromedial prefrontal cortex and areas associated with lower level embodied representations

Luna et al (161)	11:6	fMRI	Decreased task-related activation in dorsolateral prefrontal cortex and posterior cingulate cortex during a spatial w orking memory task
Verly et al (162)	17:25	DTI	Absence of the right hemispheric arcuate fascicle, w hich extends from the inferior frontal gyrus to the temporal region, and w as related to low er language performance and scores

Note.—ADHD = attention deficit hyperactivity disorder, BD = bipolar disorder ALFF = amplitude of low-frequency fluctuation, DTI = diffusion tensor imaging, fMRI = functional magnetic resonance (MR) imaging, MDD = major depressive disorder, PTSD = posttraumatic stress disorder, sMRI = structural MR imaging.

* Data are ratio of patients to control subjects.

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