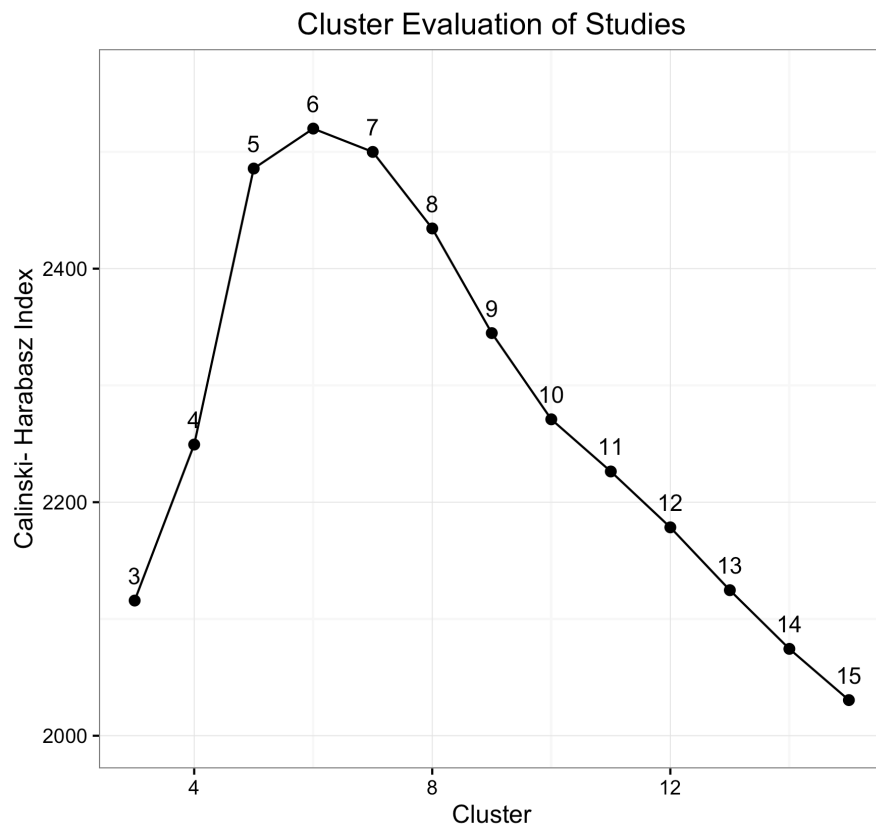


Supplementary Figures



Supplemental figure 1: Results from the cluster stability analyses. Stability analyses suggested six clusters because the peak of cluster stability exists at 6 total clusters.

Supplementary Tables

Supplemental table 1

Component 1 Extreme studies

PubMed	Title
11919005	Processing of changes in visual speech in the human auditory cortex.
20727651	Neural mechanisms involved in the oral representation of percussion music: an fMRI study.
18702594	Sentence syntax and content in the human temporal lobe: an fMRI adaptation study in auditory and visual modalities.
19595775	An fMRI study of syntactic layers: sentential and lexical aspects of embedding.
19458220	Natural, metaphoric, and linguistic auditory direction signals have distinct influences on visual motion processing.
15219590	Phonetic perceptual identification by native- and second-language speakers differentially activates brain regions involved with acoustic phonetic processing and those involved with articulatory-audio
16242924	Action selectivity in parietal and temporal cortex.
24391713	A word by any other intonation: FMRI evidence for implicit memory traces for pitch contours of spoken words in adult brains.
23376214	Syntactic priming and the lexical boost effect during sentence production and sentence comprehension: an fMRI study.
19538948	The effect of lexical priming on sentence comprehension: an fMRI study.
19925195	Neural dissociations between action verb understanding and motor imagery.
25232302	Speech motor brain regions are differentially recruited during perception of native and foreign-accented phonemes for first and second language listeners.
24650604	Are visual texture-selective areas recruited during haptic texture discrimination?
12441063	The processing of temporal pitch and melody information in auditory cortex.
23049951	The brain's dorsal route for speech represents word meaning: evidence from gesture.
23238964	Frontal and temporal contributions to understanding the iconic co-speech gestures that accompany speech.
18381767	Assimilation and accommodation patterns in ventral occipitotemporal cortex in learning a second writing system.
19350562	Neural integration of iconic and unrelated coverbal gestures: a functional MRI study.
21097958	The posterior superior temporal sulcus is sensitive to the outcome of human and non-human goal-directed actions.
25598049	Long-term experience with Chinese language shapes the fusiform asymmetry of English reading.

(a) On the positive side of Component 1.

PubMed	Title
15939409	White matter density in patients with schizophrenia, bipolar disorder and their unaffected relatives.
23141115	The effects of the catechol-O-methyltransferase val158met polymorphism on white matter connectivity in patients with panic disorder.
19962862	Cannabis use and callosal white matter structure and integrity in recent-onset schizophrenia.
23178105	Reduced gray matter volume in psychotic disorder patients with a history of childhood sexual abuse.
10775536	Clinical and molecular genetic characteristics of patients with cerebrotendinous xanthomatosis.
22721700	Altered white matter integrity in young adults with first-episode, treatment-naïve, and treatment-responsive depression.
23748501	COMT Val158Met x SLC6A4 5-HTTLPR interaction impacts on gray matter volume of regions supporting emotion processing.
16857316	The COMT val158met polymorphism and brain morphometry in healthy young adults.
19954931	White matter connectivity and psychosis in ultra-high-risk subjects: a diffusion tensor fiber tracking study.
19647324	Genetic variation in apolipoprotein E alters regional gray matter volumes in remitted late-onset depression.
24685285	A schizophrenia risk gene, ZNF804A, is associated with brain white matter microstructure.
22841128	Tract-based diffusion tensor imaging in patients with schizophrenia and their non-psychotic siblings.
20837502	Genetic and environmental influences on focal brain density in bipolar disorder.
19913331	Diffusion tensor imaging and tract-based spatial statistics in Alzheimer's disease and mild cognitive impairment.
23149033	White matter integrity in hair-pulling disorder (trichotillomania).
18515047	White matter abnormalities in subjects at ultra high-risk for schizophrenia and first-episode schizophrenic patients.
21498053	Decreased gray matter volume in the left hippocampus and bilateral calcarine cortex in coal mine flood disaster survivors with recent onset PTSD.
22079662	Assessment of white matter abnormalities in paranoid schizophrenia and bipolar mania patients.
18801597	White matter diffusion alterations in normal women at risk of Alzheimer's disease.
23084185	Fronto-occipital fasciculus, corpus callosum and superior longitudinal fasciculus tract alterations of first-episode, medication-naïve and late-onset panic disorder patients.

(b) On the negative side of Component 1.

Supplemental table 2

Component 2 Extreme studies

PubMed	Title
19817819	Group-specific regional white matter abnormality revealed in diffusion tensor imaging of medial temporal lobe epilepsy without hippocampal sclerosis.
20886579	Gray and white matter asymmetries in healthy individuals aged 21-29 years: a voxel-based morphometry and diffusion tensor imaging study.
16686655	Voxel-based optimized morphometry (VBM) of gray and white matter in temporal lobe epilepsy (TLE) with and without mesial temporal sclerosis.
16125460	Diffusion tensor imaging and tractography of distal peripheral nerves at 3 T.
11440343	Dipole localization for identification of neuronal generators in independent neighboring interictal EEG spike foci.
15325368	White matter hemisphere asymmetries in healthy subjects and in schizophrenia: a diffusion tensor MRI study.
16762567	Correlations of interictal FDG-PET metabolism and ictal SPECT perfusion changes in human temporal lobe epilepsy with hippocampal sclerosis.
18410362	Language lateralization in temporal lobe epilepsy using functional MRI and probabilistic tractography.
10656524	Systematic approach to dipole localization of interictal EEG spikes in children with extratemporal lobe epilepsies.
18226551	Brain white matter tracts degeneration in Friedreich ataxia. An in vivo MRI study using tract-based spatial statistics and voxel-based morphometry.
17266101	Bias between MNI and Talairach coordinates analyzed using the ICBM-152 brain template.
19913331	Diffusion tensor imaging and tract-based spatial statistics in Alzheimer's disease and mild cognitive impairment.
14607785	Diffusion tensor MRI of early upper motor neuron involvement in amyotrophic lateral sclerosis.
19620139	Reading epilepsy from the dominant temporo-occipital region.
18672073	Brain white matter damage in SCA1 and SCA2. An in vivo study using voxel-based morphometry, histogram analysis of mean diffusivity and tract-based spatial statistics.
18261930	Voxel-based diffusion tensor imaging in patients with mesial temporal lobe epilepsy and hippocampal sclerosis.
12595188	From diffusion tractography to quantitative white matter tract measures: a reproducibility study.
15219602	Diffusion tensor imaging: serial quantitation of white matter tract maturity in premature newborns.
20932911	Age- and gender-related changes in the normal human brain using hybrid diffusion imaging (HYDI).
23921095	Structural white matter asymmetries in relation to functional asymmetries during speech perception and production.

(a) On the positive side of Component 2.

PubMed	Title
19925198	Neural mechanisms of the testosterone-aggression relation: the role of orbitofrontal cortex.
17137563	Understanding genetic risk for aggression: clues from the brain's response to social exclusion.
18498743	Oxytocin shapes the neural circuitry of trust and trust adaptation in humans.
20736070	Emotional conflict in interpersonal interactions.
21490964	Relief as a reward: hedonic and neural responses to safety from pain.
23223206	Common and distinct neural features of social and non-social reward processing in autism and social anxiety disorder.
25243988	The medial orbitofrontal cortex encodes a general unsigned value signal during anticipation of both appetitive and aversive events.
25552568	Anticipation of peer evaluation in anxious adolescents: divergence in neural activation and maturation.
17483451	Gene-gene interaction associated with neural reward sensitivity.
22079658	Major depressive disorder is characterized by greater reward network activation to monetary than pleasant image rewards.
24760847	Valence-Specific Effects of BDNF Val66Met Polymorphism on Dopaminergic Stress and Reward Processing in Humans.
25193949	Adaptive neural reward processing during anticipation and receipt of monetary rewards in mindfulness meditators.
16339042	Oxytocin modulates neural circuitry for social cognition and fear in humans.
22015853	Don't look back in anger: neural correlates of reappraisal, analytical rumination, and angry rumination during recall of an anger-inducing autobiographical memory.
23562770	Increased neural responses to unfairness in a loss context.
21356267	5-HTTLPR and COMTval158met genotype gate amygdala reactivity and habituation.
21510979	DRD2/ANKK1 TaqI A polymorphism affects corticostriatal activity in response to negative affective facial stimuli.
20493234	Neural and behavioral responses to threatening emotion faces in children as a function of the short allele of the serotonin transporter gene.
18634888	Catechol-O-methyltransferase val158met genotype influences neural processing of reward anticipation.
21254801	The influence of emotion regulation on decision-making under risk.

(b) On the negative side of Component 2.

Supplemental table 3

Component 3 Extreme studies

PubMed	Title
19478033	The impact of second language learning on semantic and nonsemantic first language reading.
23938321	Cerebral mechanisms for different second language writing systems.
25598049	Long-term experience with Chinese language shapes the fusiform asymmetry of English reading.
18381767	Assimilation and accommodation patterns in ventral occipitotemporal cortex in learning a second writing system.
17133384	The interaction between orthographic and phonological information in children: an fMRI study.
16716387	Neuroanatomically separable effects of imageability and grammatical class during single-word comprehension.
20854914	Neuroimaging reveals dual routes to reading in simultaneous proficient readers of two orthographies.
15849713	Processing lexical semantic and syntactic information in first and second language: fMRI evidence from German and Russian.
23747332	Mapping the reading circuitry for skilled deaf readers: an fMRI study of semantic and phonological processing.
18282770	Phonological processing in deaf signers and the impact of age of first language acquisition.
22245646	Neural basis of phonological processing in second language reading: an fMRI study of Chinese regularity effect.
21146615	Neural deficits in second language reading: fMRI evidence from Chinese children with English reading impairment.
22815229	Reading acquisition reorganizes the phonological awareness network only in alphabetic writing systems.
16126414	Phonological processing in Chinese-English bilingual biscriptals: an fMRI study.
14728923	Neural processing of nouns and verbs: the role of inflectional morphology.
19538948	The effect of lexical priming on sentence comprehension: an fMRI study.
19595775	An fMRI study of syntactic layers: sentential and lexical aspects of embedding.
21693783	Brain basis of phonological awareness for spoken language in children and its disruption in dyslexia.
21391265	Neural basis of single-word reading in Spanish-English bilinguals.
19328233	Syntactic priming in German-English bilinguals during sentence comprehension.

(a) On the positive side of Component 3.

PubMed	Title
17360197	Representation of cold allodynia in the human brain--a functional MRI study.
19492300	Differential activation of the human trigeminal nuclear complex by noxious and non-noxious orofacial stimulation.
18258366	Functional MRI of the brain detects neuropathic pain in experimental spinal cord injury.
16368192	A PET activation study of brush-evoked allodynia in patients with nerve injury pain.
21291923	Brain imaging of mechanically induced muscle versus cutaneous pain.
15217377	Neural activation during experimental allodynia: a functional magnetic resonance imaging study.
17336547	Mapping the spinal and supraspinal pathways of dynamic mechanical allodynia in the human trigeminal system using cardiac-gated fMRI.
17050704	Trigeminal neuropathic pain alters responses in CNS circuits to mechanical (brush) and thermal (cold and heat) stimuli.
20732744	Bilateral activation of the trigeminothalamic tract by acute orofacial cutaneous and muscle pain in humans.
15601733	Regional intensive and temporal patterns of functional MRI activation distinguishing noxious and innocuous contact heat.
21677181	Parallel processing of nociceptive and non-nociceptive somatosensory information in the human primary and secondary somatosensory cortices: evidence from dynamic causal modeling of functional magnet
25461267	Cerebral responses and role of the prefrontal cortex in conditioned pain modulation: an fMRI study in healthy subjects.
22537316	Phantom digit somatotopy: a functional magnetic resonance imaging study in forearm amputees.
11673327	Phantom movements and pain. An fMRI study in upper limb amputees.
16112876	Differential coding of hyperalgesia in the human brain: a functional MRI study.
22096519	Evidence for thalamic involvement in the thermal grill illusion: an FMRI study.
19375510	Offset analgesia is mediated by activation in the region of the periaqueductal grey and rostral ventromedial medulla.
22539862	BOLD responses in somatosensory cortices better reflect heat sensation than pain.
19027233	Neuropathic pain and primary somatosensory cortex reorganization following spinal cord injury.
18329293	Human secondary somatosensory cortex is involved in the processing of somatosensory rare stimuli: an fMRI study.

(b) On the negative side of Component 3.

Supplemental table 4

Component 4 Extreme studies

PubMed	Title
17689985	Impact of the COMT Val108/158 Met and DAT genotypes on prefrontal function in healthy subjects.
18252743	COMT val158met genotype affects recruitment of neural mechanisms supporting fluid intelligence.
23748501	COMT Val158Met x SLC6A4 5-HTTLPR interaction impacts on gray matter volume of regions supporting emotion processing.
23859480	Modulating effect of COMT genotype on the brain regions underlying proactive control process during inhibition.
19054502	Opposite effects of catechol-O-methyltransferase Val158Met on cortical function in healthy subjects and patients with schizophrenia.
18988738	MTHFR 677C --> T genotype disrupts prefrontal function in schizophrenia through an interaction with COMT 158Val --> Met.
19641018	COMT val108/158 met genotype affects neural but not cognitive processing in healthy individuals.
17483451	Gene-gene interaction associated with neural reward sensitivity.
24384148	Structural neuroimaging correlates of allelic variation of the BDNF val66met polymorphism.
18423780	Prion protein M129V polymorphism affects retrieval-related brain activity.
19666577	Epistasis between the DAT 3' UTR VNTR and the COMT Val158Met SNP on cortical function in healthy subjects and patients with schizophrenia.
18374902	Epistasis between dopamine regulating genes identifies a nonlinear response of the human hippocampus during memory tasks.
18634888	Catechol-O-methyltransferase val158met genotype influences neural processing of reward anticipation.
19482231	Influence of SLC6A3 and COMT variation on neural activation during response inhibition.
16452664	The dopaminergic midbrain participates in human episodic memory formation: evidence from genetic imaging.
17427209	Abnormal cortical activation during response inhibition in 22q11.2 deletion syndrome.
21514925	Influence of the COMT genotype on working memory and brain activity changes during development.
22306803	Interaction of COMT val158met and externalizing behavior: relation to prefrontal brain activity and behavioral performance.
16330500	The association between the Val158Met polymorphism of the catechol-O-methyl transferase gene and morphological abnormalities of the brain in chronic schizophrenia.
22387174	Catechol-O-methyltransferase gene variation: impact on amygdala response to aversive stimuli.

(a) On the positive side of Component 4.

PubMed	Title
17360197	Representation of cold allodynia in the human brain--a functional MRI study.
16368192	A PET activation study of brush-evoked allodynia in patients with nerve injury pain.
17050704	Trigeminal neuropathic pain alters responses in CNS circuits to mechanical (brush) and thermal (cold and heat) stimuli.
22096519	Evidence for thalamic involvement in the thermal grill illusion: an FMRI study.
15217377	Neural activation during experimental allodynia: a functional magnetic resonance imaging study.
25461267	Cerebral responses and role of the prefrontal cortex in conditioned pain modulation: an fMRI study in healthy subjects.
17336547	Mapping the spinal and supraspinal pathways of dynamic mechanical allodynia in the human trigeminal system using cardiac-gated fMRI.
19492300	Differential activation of the human trigeminal nuclear complex by noxious and non-noxious orofacial stimulation.
24741051	Neuroanatomical profiles of deafness in the context of native language experience.
18258366	Functional MRI of the brain detects neuropathic pain in experimental spinal cord injury.
20802090	Physical temperature effects on trust behavior: the role of insula.
15601733	Regional intensive and temporal patterns of functional MRI activation distinguishing noxious and innocuous contact heat.
22539862	BOLD responses in somatosensory cortices better reflect heat sensation than pain.
16112876	Differential coding of hyperalgesia in the human brain: a functional MRI study.
18614290	Central representation of cold-evoked pain relief in capsaicin induced pain: an event-related fMRI study.
18471869	The bimodal bilingual brain: effects of sign language experience.
16434417	Mechanisms of central neuropathic pain: a combined psychophysical and fMRI study in syringomyelia.
25598049	Long-term experience with Chinese language shapes the fusiform asymmetry of English reading.
17407825	Capsaicin-induced thermal hyperalgesia and sensitization in the human trigeminal nociceptive pathway: an fMRI study.
18384958	Brain dynamics for perception of tactile allodynia (touch-induced pain) in postherpetic neuralgia.

(b) On the negative side of Component 4.

Supplemental table 5

Component 5 Extreme studies

PubMed	Title
19467357	Innocent intentions: a correlation between forgiveness for accidental harm and neural activity.
18342544	The neural basis of belief encoding and integration in moral judgment.
17376703	Neural correlates of true and false belief reasoning.
22300812	Functional activity of the right temporo-parietal junction and of the medial prefrontal cortex associated with true and false belief reasoning.
22406016	The neural dissociation of subjective valuation from choice processes in intertemporal choice.
22221735	The neural predictors of choice preference in intertemporal choice.
23160812	Roman Catholic beliefs produce characteristic neural responses to moral dilemmas.
25298010	Is moral beauty different from facial beauty? Evidence from an fMRI study.
20678489	Modulation of the cortical false belief network during development.
19878727	A functional imaging investigation of moral deliberation and moral intuition.
22711879	Differential neural circuitry and self-interest in real vs hypothetical moral decisions.
20350933	Unfair? It depends: neural correlates of fairness in social context.
24662580	Prefrontal mechanisms in preference and non-preference-based judgments.
23562770	Increased neural responses to unfairness in a loss context.
18203696	Neural correlates of human virtue judgment.
21452951	Is morality unified? Evidence that distinct neural systems underlie moral judgments of harm, dishonesty, and disgust.
22459338	Moral decision-making, ToM, empathy and the default mode network.
20150342	On the wrong side of the trolley track: neural correlates of relative social valuation.
18606175	The influence of prior record on moral judgment.
24790211	Social equality in the number of choice options is represented in the ventromedial prefrontal cortex.

(a) On the positive side of Component 5.

PubMed	Title
23748501	COMT Val158Met x SLC6A4 5-HTTLPR interaction impacts on gray matter volume of regions supporting emotion processing.
17689985	Impact of the COMT Val108/158 Met and DAT genotypes on prefrontal function in healthy subjects.
18252743	COMT val158met genotype affects recruitment of neural mechanisms supporting fluid intelligence.
19054502	Opposite effects of catechol-O-methyltransferase Val158Met on cortical function in healthy subjects and patients with schizophrenia.
23859480	Modulating effect of COMT genotype on the brain regions underlying proactive control process during inhibition.
24384148	Structural neuroimaging correlates of allelic variation of the BDNF val66met polymorphism.
22387174	Catechol-O-methyltransferase gene variation: impact on amygdala response to aversive stimuli.
18988738	MTHFR 677C --> T genotype disrupts prefrontal function in schizophrenia through an interaction with COMT 158Val --> Met.
21156209	COMT Val158Met polymorphism, verbalizing of emotion and activation of affective brain systems.
17483451	Gene-gene interaction associated with neural reward sensitivity.
19641018	COMT val108/158 met genotype affects neural but not cognitive processing in healthy individuals.
16330500	The association between the Val158Met polymorphism of the catechol-O-methyl transferase gene and morphological abnormalities of the brain in chronic schizophrenia.
19666577	Epistasis between the DAT 3' UTR VNTR and the COMT Val158Met SNP on cortical function in healthy subjects and patients with schizophrenia.
21356267	5-HTTLPR and COMTval158met genotype gate amygdala reactivity and habituation.
18634888	Catechol-O-methyltransferase val158met genotype influences neural processing of reward anticipation.
19482231	Influence of SLC6A3 and COMT variation on neural activation during response inhibition.
21514925	Influence of the COMT genotype on working memory and brain activity changes during development.
22306803	Interaction of COMT val158met and externalizing behavior: relation to prefrontal brain activity and behavioral performance.
18423780	Prion protein M129V polymorphism affects retrieval-related brain activity.
16857316	The COMT val158met polymorphism and brain morphometry in healthy young adults.

(a) On the positive side of Component 5.

Supplemental table 6

Extreme words per cluster

Cluster	Most 20 frequent words	Least 20 frequent words
1	process, left, tempor, frontal, gyrus, inferior, word, superior, auditori, languag, semant, hemispher, middl, percept, speech, recognit, complex, read, mean, sulcus	master, focuss, fruit, innat, singular, strip, anteced, kept, learnt, mapp, posterolater, quiet, anterolater, nonmusician, orbitali, cogn, colleg, holist, inferotempor, nonlinguist
2	brain, control, imag, patient, subject, correl, use, group, compar, connect, signific, cognit, differ, chang, healthi, analysi, bilater, age, base, structur	breakdown, checklist, degen, ecnp, inadequ, custom, cut, epidemiolog, eventu, inpati, plateau, subsampl, coexist, indistinguish, mortem, nation, proof, suppli, algebra, clinician
3	cortic, motor, pain, movement, bold, hand, stimul, sensori, primari, induc, thalamus, bodi, blood, somatosensori, central, appli, evok, intens, sensorimotor, record	electromyograph, exacerb, neglig, collater, transmit, innerv, allevi, amplif, bowel, cerebrum, debilit, genicul, fingertip, first, peripheri, cyclic, subthreshold, territori, width, desynchron
4	activ, function, region, cortex, task, studi, relat, area, fmri, result, network, suggest, perform, memori, effect, visual, magnet, involv, pariet, investig	favour, host, vast, disput, expens, obscur, truli, wealth, abolish, accentu, instantan, necessit, perfect, prescrib, succeed, sudden, convolv, decay, necess, paid
5	respons, associ, neural, increas, emot, prefront, reson, particip, anterior, find, behavior, stimuli, face, individu, cingul, examin, medial, amygdala, negat, social	foster, operation, philosoph, schedul, suboptim, pituitari, problemat, assay, evoc, height, idiosyncrat, avenu, cautious, endocrin, give, salivari, deeper, laden, told, tryptophan
6	variat, genet, dopamin, gene, carrier, allel, genotyp, receptor, polymorph, dopaminerg, variant, met, dose, comt, serotonin, suscept, val, mutat, phenotyp, apo	norepinephrin, enzym, ethnic, neuromodul, tandem, composit, methyltransferas, neurotroph, methyl, uptak, catechol, glutam, monozygot, molecular, serum, commiss, apolipoprotein, neurotransmitt, asymptomat, delet

Note. The 20 most and least frequent words per cluster. The most frequent words help characterize the subdomain within functional neuroimaging. The least frequent words also help us interpret which words are rarely used in that cluster, which helps characterize the types of studies not within the subdomains of functional neuroimaging.

Supplemental table 7

Terms close to the cluster barycenters.

Cluster	Top 20 Words Closest to the Center of words clusters
1	decod, nonsens, class, occipitotempor, regular, ifg, heteromod, anterolater, inner, pseudo, specialis, passag, figur, embed, smg, meaningless, letter, broca, artificii, learner
2	homogen, regress, heterogen, widespread, mri, predictor, disrupt, entorhin, patient, covari, ancova, incid, statist, onset, lower, reduct, clinic, subtl, enlarg, priori
3	peripher, transmit, primari, subthreshold, secundari, contact, sharp, cyclic, tip, flow, effer, analogu, rtms, threshold, territori, reflex, genicul, anesthet, calibr, burst
4	necessari, varieti, seri, propos, step, separ, causal, allow, permit, accord, exact, driven, temporari, manner, equival, path, necessarili, assumpt, hybrid, model
5	foster, experienc, laboratori, dorsomedi, negat, tendenc, subjected, psycholog, acc, positiv, pleas, detriment, prone, diminish, take, ventromedi, introspect, style, remind, paracingul
6	gene, methyl, nucleotid, snp, transport, protein, delet, carrier, variat, genet, dopamin, glutam, uptak, composit, suscept, mutat, ethnic, variant, fmr, genom

Note. The 20 terms closest to the center of each cluster. These terms help characterize the expected “average” or typical study within each cluster.

Supplemental table 8

Studies closest to the “barycenter” of cluster 1

PubMed	Title
19715732	Neural activations correlated with reading speed during reading novels.
19812331	Temporal order processing of syllables in the left parietal lobe.
19580874	Time course and functional neuroanatomy of speech segmentation in adults.
21600637	Brain networks associated with sublexical properties of Chinese characters.
16855090	Cracking the language code: neural mechanisms underlying speech parsing.
20143384	Left cytoarchitectonic BA 44 processes syntactic gender violations in determiner phrases.
24845161	Neural correlates and network connectivity underlying narrative production and comprehension: A combined fMRI and PET study.
15850725	Adults and children processing music: an fMRI study.
17133399	Neural characteristics of successful and less successful speech and word learning in adults.
18639536	fMRI characterization of the language formulation area.
24135134	Cross-linguistic parallels in processing derivational morphology: evidence from Polish.
22691614	Neural correlates of continuous causal word generation.
20627366	An fMRI study of sentence-embedded lexical-semantic decision in children and adults.
21994390	Explaining left lateralization for words in the ventral occipitotemporal cortex.
22504766	From a concept to a word in a syntactically complete sentence: an fMRI study on spontaneous language production in an overt picture description task.
25463812	Early MEG markers for reading Chinese phonograms: Evidence from radical combinability and consistency effects.
19931402	Phonological processing in post-lingual deafness and cochlear implant outcome.
16842827	An event-related fMRI investigation of phonological-lexical competition.
18778780	Piecemeal recruitment of left-lateralized brain areas during reading: a spatio-functional account.
25528288	Visuospatial complexity modulates reading in the brain.

Supplemental table 9

Studies closest to the “barycenter” of cluster 2

PubMed	Title
18172852	Cortical dysfunction in patients with Huntington's disease during working memory performance.
23993992	Inferior frontal and insular cortical thinning is related to dysfunctional brain activation/deactivation during working memory task in schizophrenic patients.
17627848	Distinct mechanisms of altered brain activation in patients with multiple sclerosis.
22984460	Intrinsic brain connectivity related to age in young and middle aged adults.
16054343	Functional imaging evidence of the relationship between recurrent psychotic episodes and neurodegenerative course in schizophrenia.
21095105	Correlated structural and functional brain abnormalities in the default mode network in schizophrenia patients.
20053346	Alterations in regional homogeneity of resting-state brain activity in autism spectrum disorders.
19699190	Abnormal resting-state functional connectivity patterns of the putamen in medication-naive children with attention deficit hyperactivity disorder.
23426796	Network analysis of auditory hallucinations in nonpsychotic individuals.
22578721	Default mode network activity in schizophrenia studied at resting state using probabilistic ICA.
25226035	Disrupted brain functional network in internet addiction disorder: a resting-state functional magnetic resonance imaging study.
18653667	Development of anterior cingulate functional connectivity from late childhood to early adulthood.
24824731	Nonlinear complexity analysis of brain FMRI signals in schizophrenia.
18952678	Control networks in paediatric Tourette syndrome show immature and anomalous patterns of functional connectivity.
22815223	Executive performance is related to regional gray matter volume in healthy older individuals.
24380677	Spontaneous brain activity in adult patients with moyamoya disease: a resting-state fMRI study.
15325350	Covariance PET patterns in early Alzheimer's disease and subjects with cognitive impairment but no dementia: utility in group discrimination and correlations with functional performance.
18053618	Brain structure and function related to cognitive reserve variables in normal aging, mild cognitive impairment and Alzheimer's disease.
25445623	Disruptive changes of cerebellar functional connectivity with the default mode network in schizophrenia.
25505309	Modality-spanning deficits in attention-deficit/hyperactivity disorder in functional networks, gray matter, and white matter.

Supplemental table 10

Studies closest to the “barycenter” of cluster 3

PubMed	Title
15499576	Effects of electroacupuncture versus manual acupuncture on the human brain as measured by fMRI.
23451129	Different brain activation under left and right ventricular stimulation: an fMRI study in anesthetized rats.
19666085	An fMRI study of neuronal specificity of an acupoint: electroacupuncture stimulation of Yanglingquan (GB34) and its sham point.
15036060	Effects of distraction on magnetoencephalographic responses ascending through C-fibers in humans.
21741443	Cortical processing of tactile direction discrimination based on spatiotemporal cues in man.
22451353	Perceptual plasticity is mediated by connectivity changes of the medial thalamic nucleus.
23523804	Neuroimaging to detect cortical projection of vestibular response to caloric stimulation in young and older adults using functional near-infrared spectroscopy (fNIRS).
20708069	Processing in prefrontal cortex underlies tactile direction discrimination: An fMRI study of a patient with a traumatic spinal cord lesion.
17990299	Functional neuroanatomical investigation of vision-related acupuncture point specificity--a multisession fMRI study.
19061937	The neural substrates of verum acupuncture compared to non-penetrating placebo needle: an fMRI study.
23769917	Comparing neural response to painful electrical stimulation with functional MRI at 3 and 7 T.
17157035	Test-retest study of fMRI signal change evoked by electroacupuncture stimulation.
12062028	Driving plasticity in human adult motor cortex is associated with improved motor function after brain injury.
18495495	Behavioral correlates of negative BOLD signal changes in the primary somatosensory cortex.
17293127	Activation of the supplementary motor area (SMA) during voluntary pelvic floor muscle contractions--an fMRI study.
14642286	Functional imaging of perceptual learning in human primary and secondary somatosensory cortex.
12809978	Cortical motor areas in plantar response: an event-related functional magnetic resonance imaging study in normal subjects.
20884359	Representation of somatosensory inputs within the cortical autonomic network.
19559684	Acupuncture mobilizes the brain's default mode and its anti-correlated network in healthy subjects.
22245354	Taste laterality studied by means of umami and salt stimuli: an fMRI study.

Supplemental table 11

Studies closest to the “barycenter” of cluster 4

PubMed	Title
21316475	Cortical and striatal contributions to automaticity in information-integration categorization.
15907304	The activation of attentional networks.
11880658	Neural mechanisms of planning: a computational analysis using event-related fMRI.
14627638	Experience-dependent activation patterns in human brain during visual-motor associative learning.
24564464	The role of right prefrontal and medial cortex in response inhibition: interfering with action restraint and action cancellation using transcranial magnetic brain stimulation.
22759716	Building virtual reality fMRI paradigms: a framework for presenting immersive virtual environments.
23516304	Neural changes with tactile learning reflect decision-level reweighting of perceptual readout.
21976418	Optimized neural coding? Control mechanisms in large cortical networks implemented by connectivity changes.
22262876	Learning acts on distinct processes for visual form perception in the human brain.
20100583	Saliency maps in parietal cortex: imaging and computational modeling.
19945445	The impact of left hemisphere stroke on force control with familiar and novel objects: neuroanatomic substrates and relationship to apraxia.
22285219	Multiple sensitivity profiles to diversity and transition structure in non-stationary input.
20089812	The time course of ventrolateral prefrontal cortex involvement in memory formation.
15924867	Top-down reorganization of activity in the visual pathway after learning a shape identification task.
12672965	Predicting the practice effects on the blood oxygenation level-dependent (BOLD) function of fMRI in a symbolic manipulation task.
18951984	Cerebral representations of space and time.
11839605	Top-down controlled visual dimension weighting: an event-related fMRI study.
20362682	Continuous motor sequence learning: cortical efficiency gains accompanied by striatal functional reorganization.
20617884	Assessing the neural basis of uncertainty in perceptual category learning through varying levels of distortion.
18375149	Transient and linearly graded deactivation of the human default-mode network by a visual detection task.

Supplemental table 12

Studies closest to the “barycenter” of cluster 5

PubMed	Title
18344175	The neurophysiological bases of emotion: An fMRI study of the affective circumplex using emotion-denoting words.
25631056	The Brain Basis of Positive and Negative Affect: Evidence from a Meta-Analysis of the Human Neuroimaging Literature.
19555674	Neural correlates of processing stressful information: an event-related fMRI study.
16973382	A neural network reflecting individual differences in cognitive processing of emotions during perceptual decision making.
25249408	Brain Mechanisms of Social Threat Effects on Working Memory.
20418072	Escitalopram attenuates posterior cingulate activity during self-evaluation in healthy volunteers.
14659102	Humor modulates the mesolimbic reward centers.
25453167	Executive-affective connectivity in smokers viewing anti-smoking images: an fMRI study.
16081255	How do we modulate our emotions? Parametric fMRI reveals cortical midline structures as regions specifically involved in the processing of emotional valences.
18926523	Neural correlates of message tailoring and self-relatedness in smoking cessation programming.
22406357	The neural correlates of subjective pleasantness.
16764897	Us versus them: Political attitudes and party affiliation influence neural response to faces of presidential candidates.
18570205	Parsing neural mechanisms of social and physical risk identifications.
16230029	Segregated neural representation of distinct emotion dimensions in the prefrontal cortex-an fMRI study.
21642353	Response inhibition results in the emotional devaluation of faces: neural correlates as revealed by fMRI.
22287188	The social evaluation of faces: a meta-analysis of functional neuroimaging studies.
21229613	Reward and motivation systems: a brain mapping study of early-stage intense romantic love in Chinese participants.
19879365	Neural mechanisms of the influence of popularity on adolescent ratings of music.
25165065	Dissociating Bottom-Up and Top-Down Mechanisms in the Cortico-Limbic System during Emotion Processing.
23746615	The influence of combined cognitive plus social-cognitive training on amygdala response during face emotion recognition in schizophrenia.

Supplemental table 13

Studies closest to the “barycenter” of cluster 6

PubMed	Title
22438288	Interaction between effects of genes coding for dopamine and glutamate transmission on striatal and parahippocampal function.
22368081	A gene-brain-cognition pathway: prefrontal activity mediates the effect of COMT on cognitive control and IQ.
22032950	The impact of serotonin transporter (5-HTTLPR) genotype on the development of resting-state functional connectivity in children and adolescents: a preliminary report.
19650139	Impact of schizophrenia-risk gene dysbindin 1 on brain activation in bilateral middle frontal gyrus during a working memory task in healthy individuals.
18234415	A functional variant of the tryptophan hydroxylase 2 gene impacts working memory: a genetic imaging study.
22947540	The dopamine D2 receptor gene DRD2 and the nicotinic acetylcholine receptor gene CHRNA4 interact on striatal gray matter volume: evidence from a genetic imaging study.
16202396	Monoamine oxidase-a genetic variations influence brain activity associated with inhibitory control: new insight into the neural correlates of impulsivity.
23620758	Modulatory effects of the piccolo genotype on emotional memory in health and depression.
19046394	Association of the SerCys DISC1 polymorphism with human hippocampal formation gray matter and function during memory encoding.
21232548	fMRI activation during response inhibition and error processing: the role of the DAT1 gene in typically developing adolescents and those diagnosed with ADHD.
19878929	Baseline brain perfusion and the serotonin transporter promoter polymorphism.
21596533	Relationship of DAT1 and adult ADHD to task-positive and task-negative working memory networks.
22227051	The NOS1 variant rs6490121 is associated with variation in prefrontal function and grey matter density in healthy individuals.
22699906	Gender modulates the APOE epsilon4 effect in healthy older adults: convergent evidence from functional brain connectivity and spinal fluid tau levels.
17481593	Genetic variation in serotonin transporter alters resting brain function in healthy individuals.
22749356	The dopamine transporter haplotype and reward-related striatal responses in adult ADHD.
23437284	CACNA1C risk variant and amygdala activity in bipolar disorder, schizophrenia and healthy controls.
24361663	Effects of MIR137 on fronto-amygdala functional connectivity.
22398981	Eye-of-the-Tiger sign is not Pathognomonic of Pantothenate Kinase-Associated Neurodegeneration in Adult Cases.
21397462	Neural hyperactivation in carriers of the Alzheimer's risk variant on the clusterin gene.

Supplemental table 14

Most average and unique studies and words.

PubMed	Cluster	Title
19327402	4	Understanding why patients with schizophrenia do not perceive the hollow-mask illusion using dynamic causal modelling.
22542844	4	Decreased functional brain activation in Friedreich ataxia using the Simon effect task.
16650836	4	Individual differences in the functional neuroanatomy of inhibitory control.
20080151	4	Activation of the limbic system under 30% oxygen during a visuospatial task: an fMRI study.
22578707	4	Aging effects on functional auditory and visual processing using fMRI with variable sensory loading.
18072271	4	Aging and the interaction of sensory cortical function and structure.
21888982	2	Do distinct atypical cortical networks process biological motion information in adults with Autism Spectrum Disorders?
20153764	2	Coherent motion processing in autism spectrum disorder (ASD): an fMRI study.
18708149	2	Developmental changes in neural activation and psychophysiological interaction patterns of brain regions associated with interference control and time perception.
15907308	4	Objective evidence of cognitive complaints in Chronic Fatigue Syndrome: a BOLD fMRI study of verbal working memory.
22194902	2	How doctors generate diagnostic hypotheses: a study of radiological diagnosis with functional magnetic resonance imaging.
16488627	4	A rapid fMRI task battery for mapping of visual, motor, cognitive, and emotional function.
23935850	2	Affect and the brain's functional organization: a resting-state connectivity approach.
23251496	2	Investigating neural efficiency in the visuo-spatial domain: an FMRI study.
15006653	2	Segregation of cognitive and emotional function in the prefrontal cortex: a stereotactic meta-analysis.
20035830	4	Functional neuroimaging of duration discrimination on two different time scales.
18095280	2	Differential patterns of cortical activation as a function of fluid reasoning complexity.
15936178	2	Functional changes in the activity of brain regions underlying emotion processing in the elderly.
15734350	2	An fMRI study of joint attention experience.
14561452	2	Functional anatomy of impaired selective attention and compensatory processing in autism.

(a) Studies closest to global barycenter (origin).

PubMed	Cluster	Title
23748501	6	COMT Val158Met x SLC6A4 5-HTTLPR interaction impacts on gray matter volume of regions supporting emotion processing.
17689985	6	Impact of the COMT Val108/158 Met and DAT genotypes on prefrontal function in healthy subjects.
18252743	6	COMT val158met genotype affects recruitment of neural mechanisms supporting fluid intelligence.
23859480	6	Modulating effect of COMT genotype on the brain regions underlying proactive control process during inhibition.
19054502	6	Opposite effects of catechol-O-methyltransferase Val158Met on cortical function in healthy subjects and patients with schizophrenia.
24384148	6	Structural neuroimaging correlates of allelic variation of the BDNF val66met polymorphism.
18988738	6	MTHFR 677C --> T genotype disrupts prefrontal function in schizophrenia through an interaction with COMT 158Val --> Met.
17483451	6	Gene-gene interaction associated with neural reward sensitivity.
19641018	6	COMT val108/158 met genotype affects neural but not cognitive processing in healthy individuals.
22387174	6	Catechol-O-methyltransferase gene variation: impact on amygdala response to aversive stimuli.
16330500	6	The association between the Val158Met polymorphism of the catechol-O-methyl transferase gene and morphological abnormalities of the brain in chronic schizophrenia.
21156209	6	COMT Val158Met polymorphism, verbalizing of emotion and activation of affective brain systems.
19666577	6	Epistasis between the DAT 3' UTR VNTR and the COMT Val158Met SNP on cortical function in healthy subjects and patients with schizophrenia.
18634888	6	Catechol-O-methyltransferase val158met genotype influences neural processing of reward anticipation.
18423780	6	Prion protein M129V polymorphism affects retrieval-related brain activity.
19482231	6	Influence of SLC6A3 and COMT variation on neural activation during response inhibition.
17360197	3	Representation of cold allodynia in the human brain--a functional MRI study.
21514925	6	Influence of the COMT genotype on working memory and brain activity changes during development.
16857316	6	The COMT val158met polymorphism and brain morphometry in healthy young adults.
22306803	6	Interaction of COMT val158met and externalizing behavior: relation to prefrontal brain activity and behavioral performance.

(b) Studies furthest from global barycenter (origin).

Word	Cluster
demonstr	4
result	4
possibl	4
presenc	4
investig	4
studi	4
consid	4
begin	4
remain	4
shown	4
explor	4
addit	4
reveal	4
evid	4
establish	4
known	4
explain	2
reson	5
magnet	4
function	4

(c) Words closest to global barycenter (origin).

Word	Cluster
val	6
comt	6
catechol	6
methyltransfer	6
as	
valmet	6
met	6
bdnf	6
dat	6
polymorph	6
enzym	6
homozyg	6
httlpr	6
genotyp	6
allodynia	3
cold	3
allel	6
neurotroph	6
homozygot	6
innocu	3
brush	3

(d) Words furthest from global barycenter (origin).

Supplemental table 15

Psychiatric and neurological terms

Word	Cluster	Freq.	Type	C1	C2	C3	C4	C5
adhd	2	580	psychiatric	<i>-1.22</i>	<i>-0.23</i>	0.45	0.48	0.08
autism	2	468	psychiatric	<i>-0.41</i>	<i>-0.12</i>	0.56	<i>-0.53</i>	0.21
bipolar	2	382	psychiatric	<i>-1.7</i>	<i>-0.04</i>	0.68	<i>-0.4</i>	0.02
unipolar	2	38	psychiatric	<i>-1.41</i>	<i>-0.61</i>	0.28	<i>-0.36</i>	0.07
anorexia	5	56	psychiatric	<i>-0.77</i>	<i>-0.74</i>	<i>-0.12</i>	<i>-0.98</i>	0.24
depress	2	1487	psychiatric	<i>-1.36</i>	<i>-0.66</i>	0.31	<i>-0.27</i>	<i>-0.17</i>
antidepress	2	112	psychiatric	<i>-1.42</i>	<i>-0.81</i>	<i>-0.12</i>	<i>-0.12</i>	<i>-0.33</i>
obsess	2	113	psychiatric	<i>-1.5</i>	<i>-0.26</i>	0.19	<i>-0.17</i>	0.3
schizophrenia	2	2250	psychiatric	<i>-1.12</i>	0.17	0.58	<i>-0.01</i>	0.02
posttraumat	5	72	psychiatric	<i>-1.3</i>	<i>-0.99</i>	0.21	<i>-1.11</i>	0.01
traumat	2	151	psychiatric	<i>-1.24</i>	<i>-0.42</i>	0.22	<i>-0.78</i>	0.18
alzheim	2	409	neurological	<i>-1.28</i>	0.67	0.52	0.72	0.28
dementia	2	250	neurological	<i>-1.27</i>	0.76	0.76	0.29	0.31
frontotempor	2	131	neurological	<i>-0.76</i>	0.63	0.8	<i>-0.27</i>	<i>-0.12</i>
dystonia	6	62	neurological	<i>-1.05</i>	0.75	<i>-0.61</i>	1.01	<i>-1.64</i>
parkinson	2	232	neurological	<i>-0.88</i>	0.47	<i>-0.42</i>	0.64	0.04
huntington	2	29	neurological	<i>-1.15</i>	0.33	0.03	0.22	<i>-0.13</i>
epilepsi	2	277	neurological	<i>-1.21</i>	1.35	<i>-0.3</i>	0.33	0.76

Note. Psychiatric vs. neurological terms (as defined by Crossley et al., 2015) within our components solution. Negative loadings are *italicized*. Components 2 and 4 show a clear dissociation between psychiatric and neurological disorders within the semantic space of Neurosynth.

Supplemental table 16

Select terms to highlight unexpected groupings

Terms	Cluster	Terms	Cluster
<i>traumat, heroin, cannabi, comorbid, antidepress, depress, dsm, spectrum</i>	2	<i>appetit, crave, discount, smoke, smoker, trait, eat, posttraumat, stress, distress, riski, reward, nicotin, abus, cocain, trauma, addict, alcohol, marijuana, food, gambl</i>	5

(a) Substance use disorder related terms

Terms	Cluster	Terms	Cluster
<i>amnes, amnesia, episod, hippocampus, hippocampi, hippocamp, parahippocamp, parahippocampus</i>	2	<i>autobiograph, memor, memori, novelti, recal, recogn, recollect, recenc</i>	4

(b) Memory related terms

Note. Illustration of words that could be expected together in single clusters but are not. For example, “heroin” and “cannabi” (short for cannabis) do not appear in the same cluster as “addict” nor “alcohol”, nor even “marijuana”. Similarly, many memory terms are not in the same cluster as the typical brain regions in memory studies (e.g., hippocampus). These differences highlight barriers towards standard ontologies as they reflect either terms that could be used quite broadly across many domains (e.g., recollect), or show a development of how terminology changes over time (e.g., cannabis vs. marijuana; {dsm, spectrum} vs. trait).