

BrainMap coding scheme

<u>BrainMap Field</u>	<u>Definition</u>	<u>Examples</u>	<u>Parent Entity</u>
Paper	A set of one or more experiments reported in a single publication.		Top Level
Prose Description	A brief synopsis of what conditions the subjects underwent and which were contrasted to create statistical parametric images (SPIs). Composed in a strict, standard format by the person creating the BrainMap submission. Is useful when viewing entries in Search&View as it immediately conveys the experimental design of the paper. Does not include background, results, or discussion. (see also Results Synopsis)	Subjects underwent 3 conditions. Condition 1: Naming: Subjects viewed pictures and named the objects. Condition 2: Verb Generation: Subjects viewed pictures and generated semantically-related verbs of the objects. Condition 3: Rest. Experiment 1: Naming vs. Rest. Experiment 2: Verb Generation vs. Rest. Experiment 3: Naming vs. Verb Generation.	Paper
Condition	A behavioral state during which a functional brain image is acquired. Addresses experimental design, rather than intent.	Finger Tapping, Verb Generation, Reflexive Saccades, Fixation, Rest	Paper
Stimulus Modality	The sensory mechanism through which the subject was stimulated. That is, what was used to stimulate one of their five senses while they were in the scanner?	Auditory, Visual, Tactile, Olfactory, Gustatory	Condition
Stimulus Type	A specific, physical stimulus presented to the subject during the experimental condition.	Tones, Words, Faces, False Fonts, Heat, Odor	Condition
Response Modality	The sensory mechanism through which the subject makes an overt, measurable response.	Hand, Foot, Ocular, Oral/Facial	Condition

Response Type	A specific, overt response made by the subject during the experimental condition. Does not include imagined movement, silent speech, or other covert responses.	Button Press, Flexion/Extension, Saccades, Speech.	Condition
Instructions	An explicit direction that guides the behavior of the subject during the experimental conditions. Formulated as a command. If a subject was instructed to read words aloud, the instruction is "Read" and the response type is "Speech"; rather than "Speak" as the instruction.	Attend, Count, Discriminate, Recall.	Condition
External Variable	Any non-imaging measurement (behavioral, physiological, etc.) acquired during imaging.	Heart Rate, Temperature, Accuracy, Response Time	Condition
Session	The term or duration of time between the imaging set-up and the release of a subject. Most studies occur during only one session.	For multi-session studies: Before or After Treatment, Before or After Practice, Before or After Therapy	Paper
Experiment	A comparison or contrast of two or more imaged conditions that results in a statistical parametric image (SPI). Experiments are described by three keywords weighted toward intent [Context, Paradigm Class, Behavioral Domain].	Finger Tapping vs. Rest, Verb Generation vs. Word Repetition, Reflexive Saccades vs. Fixation	Paper
Context	The purpose for which an experiment was performed, classified by the type of effect sought.	Normal Mapping, Age Effects, Disease Effects, Gender Effects, Handedness Effects, Therapy Effects	Experiment

Paradigm Class	The experimental task isolated by your contrast. Typically, these paradigms have been used repeatedly by different researchers, with only minor changes made so that the essential structure is still recognizable. They have become widely known and accepted by brain imagers and generally have acquired informal (or formal) names. Multiple paradigm classes may apply for a given experiment.	Action Observation, Delayed Match To Sample, Encoding, Episodic Recall, Oddball Discrimination, Stroop, Task Switching	Experiment
Behavioral Domain	The categories and subcategories of mental operations likely to be isolated by the experimental contrast. Multiple behavioral domains may apply for a given experiment.	Cognition.Attention, Perception.Audition, Cognition.Memory.Working, Action.Execution.Speech	Experiment
Contrast	The aspects of how the conditions being compared in a given experiment are different. These differences are the possible sources for any differences in activation seen in the functional imaging data.	Stimulus Modality, Stimulus Type, Response Modality, Response Type, Instructions, External Variable, Group, Session	Experiment
Results Synopsis	A portion of the published abstract from Medline or PubMed, with the first sentences that deal with the introduction, methods, and design of the study deleted. The results synopsis should only contain the segment of the abstract concerning the results and conclusions. (see also Prose Description)		Paper

Definition of Behavioural Domains (BDs) in BrainMap

BDs related to pharmacology are not listed as any experiment on pharmacological manipulation and drug effects were excluded from our analysis

<u>Behavioral Domain</u>	<u>Definition</u>	<u>Adapted From</u>	<u>Citation</u>
Action	The mental faculty associated with overt movements of the body.	The state or process of acting or doing.	action. (n.d.). The American Heritage® Stedman's Medical Dictionary. Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=action&x=0&y=0
Action.Execution	The state or process of executing an overt movement of the body.		
Action.Execution.Speech	The state or process of overtly speaking.	The faculty or act of speaking.	speech. (n.d.). The American Heritage® Dictionary of the English Language, Fourth Edition. Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=speech&x=0&y=0
Action.Imagination	The state or process of imagining an overt movement of the body.	The faculty of imagining, or of forming mental images or concepts of what is not actually present to the senses; the action or process of forming such images or concepts.	imagination. (n.d.). Dictionary.com Unabridged (v 1.0.1). Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=imagination&x=0&y=0
Action.Inhibition	The state or process of inhibiting an overt movement of the body.	The conscious or unconscious restraint of a behavioral process, a desire, or an impulse; any of a variety of processes that are associated with the gradual attenuation, masking, and extinction of a previously conditioned response.	inhibition. (n.d.). The American Heritage® Stedman's Medical Dictionary. Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=inhibition&x=0&y=0

Action.Motion Learning	The state or process of learning how to execute an overt movement of the body.		
Action.Observation	The state or process of observing an overt movement of the body.	An act or instance of regarding attentively or watching.	observation. (n.d.). Dictionary.com Unabridged (v 1.0.1). Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=observation&x=0&y=0
Action.Preparation	The state or process of preparing for an overt movement of the body.	The state of having been made ready or prepared for use or action.	preparation. (n.d.). WordNet® 2.0. Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=preparation&x=0&y=0
Action.Rest	The state or process of resting from overt movements of the body.	The cessation or absence of motion.	rest. (n.d.). Dictionary.com Unabridged (v 1.0.1). Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=rest&x=0&y=0
Cognition.Memory	The mental faculty of retaining and reviving facts, events, or impressions, or of recalling or recognizing previous experiences.	The mental capacity or faculty of retaining and reviving facts, events, impressions, etc., or of recalling or recognizing previous experiences.	memory. (n.d.). Dictionary.com Unabridged (v 1.0.1). Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=memory&x=0&y=0
Cognition.Memory.Working	The memory for intermediate results that must be held during thinking.	The memory for intermediate results that must be held during thinking.	working memory. (n.d.). WordNet® 2.0. Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=working memory&x=0&y=0
Cognition.Memory.Explicit	The memory that consists of information stored and retrieved explicitly from the external world. This information is about a specific event that has occurred at a specific time and	Consists of information stored and retrieved explicitly from the external world. This information is about a specific event that has occurred at a specific time and place. Associations are done with previously related	explicit memory. (n.d.). Wikipedia. Retrieved September 08, 2006, from Wikipedia.org website: http://en.wikipedia.org/wiki/Explicit_memory

	place. Associations are done with previously related stimuli or experiences in the formation, storage and subsequent retrieval of these memories.	stimuli or experiences in the formation, storage and subsequent retrieval of these memories.	
Cognition.Memory.Implicit	The long-term memory of skills and procedures; is often not easily verbalized, but can be used without consciously thinking about it.	The long-term memory of skills and procedures; is often not easily verbalized, but can be used without consciously thinking about it.	implicit memory. (n.d.). Wikipedia. Retrieved September 08, 2006, from Wikipedia.org website: http://en.wikipedia.org/wiki/Implicit_memory
Cognition.Music	The mental faculty associated with the art of sound in time that expresses ideas and emotions in significant forms through the elements of rhythm, melody, harmony, and color.	An art of sound in time that expresses ideas and emotions in significant forms through the elements of rhythm, melody, harmony, and color.	music. (n.d.). Dictionary.com Unabridged (v 1.0.1). Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=music&x=0&y=0
Cognition.Reasoning	The mental faculty of forming conclusions, judgments, or inferences from facts or premises.	The process of forming conclusions, judgments, or inferences from facts or premises.	reasoning. (n.d.). Dictionary.com Unabridged (v 1.0.1). Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=reasoning&x=0&y=0
Cognition.Social Cognition	The mental faculty associated with how people process social information, especially its encoding, storage, retrieval, and application to social situations.	The study of how people process social information, especially its encoding, storage, retrieval, and application to social situations.	social cognition. (n.d.). Wikipedia. Retrieved August 13, 2009, from Wikipedia.org website: http://en.wikipedia.org/wiki/Social_cognition

Cognition.Soma	The mental faculty associated with knowledge of one's body.		
Cognition.Space	The mental faculty associated with awareness of the three-dimensional expanse in which all material objects are located and all events occur.	The unlimited or incalculably great three-dimensional realm or expanse in which all material objects are located and all events occur.	space. (n.d.). Dictionary.com Unabridged (v 1.0.1). Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=space&x=0&y=0
Cognition.Time	The mental faculty associated with the system of sequential relations that any event has to any other as past, present, or future.	The system of those sequential relations that any event has to any other, as past, present, or future; indefinite and continuous duration regarded as that in which events succeed one another.	time. (n.d.). Dictionary.com Unabridged (v 1.0.1). Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=time&x=0&y=0
Emotion	The mental faculty of experiencing an affective state of consciousness such as joy, sorrow, fear, hate, etc.	An affective state of consciousness in which joy, sorrow, fear, hate, or the like, is experienced, as distinguished from cognitive and volitional states of consciousness.	emotion. (n.d.). Dictionary.com Unabridged (v 1.0.1). Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=emotion&x=0&y=0
Emotion.Anxiety	An emotion characterized by distress or uneasiness of mind caused by fear of danger or misfortune.	Distress or uneasiness of mind caused by fear of danger or misfortune.	anxiety. (n.d.). Dictionary.com Unabridged (v 1.0.1). Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=anxiety&x=0&y=0
Emotion.Disgust	An emotion characterized by a strong distaste,	A strong distaste; nausea; loathing.	disgust. (n.d.). Dictionary.com Unabridged (v 1.0.1). Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=disgust&x=0&y=0

	nausea, or loathing.		
Emotion.Fear	An emotion of being afraid aroused by distress, impending danger, evil, pain, etc.	A distressing emotion aroused by impending danger, evil, pain, etc., whether the threat is real or imagined; the feeling or condition of being afraid.	fear. (n.d.). Dictionary.com Unabridged (v 1.0.1). Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=fear&x=0&y=0
Emotion.Happiness	An emotion of well-being ranging from contentment to intense joy.	A state of well-being characterized by emotions ranging from contentment to intense joy.	happiness. (n.d.). WordNet@ 2.0. Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=happiness&x=0&y=0
Emotion.Happiness.Humor	An emotion of characterized by a comic, absurd, or incongruous quality causing amusement.	A comic, absurd, or incongruous quality causing amusement.	humor. (n.d.). Dictionary.com Unabridged (v 1.1). Retrieved April 02, 2007, from Dictionary.com website: http://dictionary.reference.com/browse/humor
Emotion.Sadness	An emotion of sorrow or mourning characterized by unhappiness or grief.	Affected by unhappiness or grief; sorrowful or mournful.	sadness. (n.d.). Dictionary.com Unabridged (v 1.0.1). Retrieved October 02, 2006, from Dictionary.com website: http://dictionary.reference.com/browse/sadness
Emotion.Anger	An emotion of wrath or ire characterized by displeasure and belligerence aroused by a wrong.	A strong feeling of displeasure and belligerence aroused by a wrong; wrath; ire.	anger. (n.d.). Dictionary.com Unabridged (v 1.0.1). Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=anger&x=0&y=0
Perception	The mental faculty of apprehending knowledge by means of the senses.	The act or faculty of apprehending by means of the senses.	perception. (n.d.). Dictionary.com Unabridged (v 1.0.1). Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=perception&x=0&y=0
Perception.Audition	The sense of hearing.	The sense, ability, or power of hearing.	audition. (n.d.). The American Heritage® Stedman's Medical Dictionary. Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=audition&x=0&y=0

Perception.Gustation	The sense of tasting.	The act or faculty of tasting.	gustation. (n.d.). The American Heritage® Dictionary of the English Language, Fourth Edition. Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=gustation&x=0&y=0
Perception.Olfaction	The sense of smelling.	The act or process of smelling.	olfaction. (n.d.). The American Heritage® Dictionary of the English Language, Fourth Edition. Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=olfaction&x=0&y=0
Perception.Somesthesis	The sense of bodily perception.	The faculty of bodily perception; sensory systems associated with the body; includes skin senses and proprioception.	somesthesis. (n.d.). WordNet® 2.0. Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=somesthesis&x=0&y=0
Perception.Somesthesis.Pain	The sense of bodily perception associated with an unpleasant sensation occurring in varying degrees of severity as a consequence of injury, disease, or emotional disorder.	An unpleasant sensation occurring in varying degrees of severity as a consequence of injury, disease, or emotional disorder.	pain. (n.d.). The American Heritage® Dictionary of the English Language, Fourth Edition. Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=pain&x=0&y=0
Perception.Vision	The sense of sight.	The act or power of sensing with the eyes; sight.	vision. (n.d.). Dictionary.com Unabridged (v 1.0.1). Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=vision&x=0&y=0
Perception.Vision.Color	The visual perception of the quality of an object or substance with respect to light reflected by the object, usually determined visually by measurement of hue, saturation, and brightness of the reflected light.	The quality of an object or substance with respect to light reflected by the object, usually determined visually by measurement of hue, saturation, and brightness of the reflected light; saturation or chroma; hue.	color. (n.d.). Dictionary.com Unabridged (v 1.0.1). Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=color&x=0&y=0

Perception.Vision.Motion	The visual perception of the action or process of moving or of changing place or position.	The action or process of moving or of changing place or position; movement.	motion. (n.d.). Dictionary.com Unabridged (v 1.0.1). Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=motion&x=0&y=0
Perception.Vision.Shape	The visual perception of the quality of a distinct object in having an external surface or outline of specific form or figure.	The quality of a distinct object or body in having an external surface or outline of specific form or figure.	shape. (n.d.). Dictionary.com Unabridged (v 1.0.1). Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=shape&x=0&y=0
Interoception	The mental faculty associated with sensitivity to stimuli originating inside of the body.	Sensitivity to stimuli originating inside of the body.	interoception. (n.d.). WordNet@ 2.0. Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=interoception&x=0&y=0
Interoception.Air-Hunger	The need for respiration.	Deep, rapid, and labored breathing caused by an increased respiratory drive due to abnormally low blood oxygen levels, as in severe heart failure or asthma.	air hunger. (n.d.). Dictionary.com Unabridged (v 1.0.1). Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?r=2&q=air+hunger
Interoception.Baroregulation	The need to regulate blood pressure.		
Interoception.Bladder	The need to eliminate urine.		
Interoception.Hunger	The need for food.	A compelling need or desire for food.	hunger. (n.d.). Dictionary.com Unabridged (v 1.0.1). Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=hunger&x=0&y=0
Interoception.Osmoregulation	The need for the body's cells to maintain fluid and electrolyte balance with their surroundings.	The process by which cells and simple organisms maintain fluid and electrolyte balance with their surroundings.	osmoregulation. (n.d.). Dictionary.com Unabridged (v 1.0.1). Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=osmoregulation&x=0&y=0

Interoception.Sexuality	The need for sexual activity.	Concern with or interest in sexual activity.	sexuality. (n.d.). The American Heritage® Stedman's Medical Dictionary. Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=sexuality&x=0&y=0
Interoception.Sleep	The need for the natural suspension, complete or partial, of consciousness.	To take the rest afforded by a suspension of voluntary bodily functions and the natural suspension, complete or partial, of consciousness; cease being awake.	sleep. (n.d.). Dictionary.com Unabridged (v 1.0.1). Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=sleep&x=0&y=0
Interoception.Thermoregulation	The need for the maintenance of a constant internal body temperature independent of the environmental temperature.	Maintenance of a constant internal body temperature independent of the environmental temperature.	thermoregulation. (n.d.). The American Heritage® Stedman's Medical Dictionary. Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=thermoregulation&x=0&y=0
Interoception.Thirst	The need for liquid that causes a sensation of dryness in the mouth and throat.	A sensation of dryness in the mouth and throat caused by need of liquid.	thirst. (n.d.). Dictionary.com Unabridged (v 1.0.1). Retrieved September 08, 2006, from Dictionary.com website: http://dictionary.reference.com/search?q=thirst&x=0&y=0

Definition of Paradigm Classes (PCs) in BrainMap

PCs related to pharmacology are not listed as any experiment on pharmacological manipulation and drug effects were excluded from our analysis

Paradigm Class	Coupled with BD	Definition
Action Observation	Action.Observation	Subjects view images of moving body parts.
Acupuncture	Perception.Somesthesis	Subjects are stimulated with Chinese acupuncture.
Anti-Saccades	Perception.Vision.Motion; Action.Inhibition	Subjects view a target and are instructed to make a saccade away from the target (to the opposite visual field).
Braille Reading	Perception.Somesthesis; Action.Execution; Cognition.Language	Blind subjects read Braille words with their finger(s).
Breath-Holding	Interoception.Air-Hunger	Subjects hold their breath.
Chewing/Swallowing	Action.Execution	Subjects chew an oral stimulus that is not food (e.g., gum) or swallow their own saliva. If the oral stimulus is food or liquid that is swallowed, then the correct paradigm class is Eating/Drinking.
Classical Conditioning	Cognition.Attention	Subjects are presented with paired stimuli (usually involving presentation of an eye puff with an auditory tone) in an attempt to study associative learning.
Counting/Calculation	Cognition	Subjects count, add, subtract, multiply, or divide various stimuli (numbers, bars, dots, etc).
Cued Explicit Recognition	Cognition.Memory.Explicit	Subjects view a list of items (words, pictures, sounds, or abstract patterns) prior to scanning. During scanning, probe words are presented and subject recall if the words are familiar or unfamiliar.
Deception Task	Cognition.Social Cognition and Emotion	Subjects are asked to perform a task and either lie or be truthful in their responses.
Deductive Reasoning	Cognition.Reasoning	Subjects are required to utilize problem-solving skills and logic to determine the correct solution; feedback is often given.

Delay Discounting Task	Cognition and Emotion	Subjects perform a type of reward task (correct performance is associated with reward, often monetary reward) in which they choose between earning a small reward immediately or a larger reward at a later time.
Delayed Match To Sample	Cognition.Memory.Working	Subjects view an item(s). After a brief delay a probe item is presented and subjects are asked to recall if the probe item was presented before the delay (during encoding). Stimuli can be words, pictures, or abstract patterns.
Divided Auditory Attention	Cognition.Attention	During the performance of an unrelated task, subjects simultaneously respond to auditory stimuli (tone or word discrimination, with or without distractors). Also often co-coded with Tone Monitor/Discrimination.
Drawing	Action.Execution	Subjects draw lines, circles, or drawings using a pen or stylus.
Eating/Drinking	Perception.Gustation	Subjects eat food (e.g., chocolate) or drink liquids (e.g., juice).
Encoding	Cognition.Memory.Explicit or Cognition.Memory.Working (depending on the length of time until recall)	Subjects view stimuli (words, pictures, letters) and are instructed to memorize them.
Episodic Recall	Cognition.Memory.Explicit or Emotion	Subjects recall items from episodic memory (autobiographical history, long-term event memories). This class is commonly used in generating a type of emotion linked to a specific memory. This class does NOT include tasks which probe semantic memory (memory of facts or concepts) in which subjects are asked to recall stimuli that were memorized prior to scanning - those are coded as Cued Explicit Recognition.

Face Monitor/Discrimination	Various	Subjects are presented with human faces and are instructed to view them passively or discriminate according to their order, gender, location, emotion, or appearance. If the subjects view the faces passively, then the experiment is NOT co-coded with Passive Viewing.
Film Viewing	Various	Subjects view movie or film clips passively or are required to make a discrimination when the clip is over.
Finger Tapping	Action.Execution	Subjects tap their fingers according to a visual, auditory, or no cue.
Fixation	Perception.Vision; Cognition.Attention; or Action.Preparation	Subjects fixate on a visual target.
Flanker Task	Cognition.Attention	Subjects are instructed to perform a task (often discriminating the direction of a central arrow) while ignoring flanking stimuli on either side, which indicate a different response than the central stimuli.
Flashing Checkerboard	Perception.Vision	Subjects view a flashing checkerboard.
Flexion/Extension	Action.Execution	Subjects move (flex and extend) their hands, arms, legs, feet, lips, tongue, etc.
Free Word List Recall	Cognition.Memory.Working or Cognition.Memory.Explicit (depending on length of delay)	Subjects view a list of words and after a delay are asked to freely recall the words presented.
Go/No-Go	Cognition.Attention; Action.Inhibition	Subjects press a button for one type of stimuli (e.g., green light or "X") and withhold a response for another (e.g., red light or "Y").
Grasping	Action.Execution	Subjects grasped or gripped a presented stimulus with their hand or mimicked grasping one that was not physically presented (i.e., was imaginary or presented as a picture or video).
Imagined Movement	Action.Imagination	Subjects imagine performing some movement (e.g., finger tapping, reaching).

Imagined Objects/Scenes	Perception.Vision.Shape; Cognition.Space; Cognition.Memory.Working	Subject generate vivid images of objects, places, concepts, hypothetical events (not in their past), or the completion of tasks.
Isometric Force	Action.Execution	Subjects use their hands or fingers to apply isometric force or complete a precision grip task.
Mental Rotation	Cognition.Space; Perception.Vision.Shape	Subjects view rotated letters, numbers, or objects (2D or 3D) and indicate if they are in their normal or mirror orientation; includes variations, but all tasks include mental rotation of stimuli.
Micturition Task	Interoception.Bladder	Subjects voided urine.
Music Comprehension/Production	Cognition.Music	Subjects listen to music passively or are asked to sing overtly.
n-back	Cognition.Memory.Working	Subjects view stimuli (words, letters, objects etc.) and are asked to recall the stimuli viewed n times previously.
Naming (Covert)	Cognition.Language.Semantics; Cognition.Language.Speech	Subjects view objects (pictures, line drawings, etc.) and name them silently.
Naming (Overt)	Cognition.Language.Semantics; Cognition.Language.Speech; Action.Execution.Speech (unless motor response is controlled for).	Subjects view objects (pictures, line drawings, etc.) and name them aloud.
Non-Painful Electrical Stimulation	Perception.Somesthesis	Subjects are electrically stimulated at a non-painful threshold.
Non-Painful Thermal Stimulation	Perception.Somesthesis	Subjects experience thermal stimulation (heat) at a non-painful threshold.

Oddball Discrimination	ALL: Cognition.Attention; Also: Various	AUDITORY: Subjects listen to tones and indicate when they hear a target tone (oddball); the majority of presented stimuli are non-targets. VISUAL: Subjects view letters or objects and indicate when they see a target stimulus (oddball); the majority of presented stimuli are non-targets.
Olfactory Monitor/Discrimination	Perception.Olfaction	Subjects are presented with odors and are instructed to smell them passively or to discriminate according to some feature (pleasant/unpleasant, strong/weak, same/different, etc.).
Orthographic Discrimination	Cognition.Language.Orthography	Subjects view letters and discriminate according to some feature (uppercase/lowercase, alphabetic order, same/different spelling of words, vowel/consonant, font size, etc.).
Pain Monitor/Discrimination	Perception.Somesthesis.Pain	Subjects experience thermal or electrical stimulation at a painful threshold.
Paired Associate Recall	Cognition.Memory.Explicit	Subjects are shown paired stimuli prior to the task. During the task, subjects are shown a single stimuli and are asked to recall the associated pair. Stimuli may be words, faces, objects, etc.
Passive Listening	Various	Subjects listen to various auditory stimuli and make no response. Stimuli include speech (words, sentences), noise, tones, etc. If the stimulus is tones, then the experiment is co-coded with Tone Monitor/Discrimination.
Passive Viewing	Various	Subjects view various visual stimuli and make no response. Stimuli include houses, faces, objects, fractals, letter strings, line drawings, complex scenes, etc. If the presented stimuli were faces, the experiments are co-coded with Face Monitor/Discrimination. But if the presented stimuli are words, the experiments are NOT coded as Passive Viewing but rather as Reading (Covert).

Phonological Discrimination	Cognition.Language.Phonology	Subjects view or listen to phonemes, syllables, or words and discriminate according to some feature of their sounds (rhyming, number of syllables, homophones, etc.).
Pitch Monitor/Discrimination	Various	Subjects are presented with various stimuli (human speech and non-speech vocalizations, animal vocalization, mechanical noise, etc.) and are instructed to listen to them passively (also co-coded with Passive Listening), or discriminate based on pitch (pleasant/unpleasant, same/different, duration, familiar/unfamiliar, male/female).
Pointing	Action.Execution	Subjects look and point at a target (e.g., cursor with their arm, hand, finger, or shoulder).
Posner Task	Cognition.Attention	Subjects view two stimuli (boxes, letters, etc.) and are cued by an arrow to attend to one of the stimuli. Subjects then discriminate and respond (e.g., press a button when one of the boxes is filled with a diagonal cross, or press the left button for an "X" and the right button for an "O").
Reading (Covert)	Cognition.Language.Speech	Subjects view words, pseudowords, Asian characters, phrases, or sentences and read them silently.
Reading (Overt)	Cognition.Language.Speech; Action.Execution.Speech (unless motor response is controlled for).	Subjects view words, pseudowords, Asian characters, phrases, or sentences and read them aloud.
Recitation/Repetition (Covert)	Cognition.Language.Speech	Subjects silently repeat or recite phonemes, words, or well-known text (nursery rhymes, Pledge of Allegiance, months of the year, etc.).
Recitation/Repetition (Overt)	Cognition.Language.Speech; Action.Execution.Speech (unless motor response is controlled for).	Subjects repeat or recite phonemes, words, or well-known text (nursery rhymes, Pledge of Allegiance, months of the year, etc.) aloud.

Rest	Action.Rest	Subjects rest passively with their eyes open or closed.
Reward Task	Cognition and Emotion	Subjects perform a task in which correct performance is associated with reward, often monetary reward.
Saccades	Perception.Vision.Motion; Action.Execution	Subjects view a target and are instructed to make a saccade to its location.
Semantic Monitor/Discrimination	Cognition.Language.Semantics	Subjects view or listen to words passively or discriminate according to their meaning (real word/pseudoword, categorization (e.g., animal or tool), abstract/concrete, living/non-living, man-made/natural, pleasant/unpleasant). For discrimination tasks, stimuli can also be pictures.
Sequence Recall/Learning	RECALL: Cognition.Memory.Working; LEARNING: Action.Motor Learning	Subjects learn and/or perform a complex sequence of finger tapping, button pressing, pointing/clicking, or various other motor responses.
Simon Task	Cognition.Attention	Subjects view arrows presented in the right or left visual field that were pointing to the left or right. Subjects respond via button press as to the direction of the arrow. In incongruent stimuli, left-pointing arrows are seen on the right side, and vice versa.
Spatial/Location Discrimination	Various	Subjects view shapes or other stimuli (letters, pictures, numbers, or arrows) and discriminate according to their location, orientation, or size.
Sternberg Task	Cognition.Memory.Working	Subjects view a string of letters. After a delay, a probe letter is presented and subjects indicate if the presented letter was in the previously viewed group.
Stroop Task	Cognition.Attention	Subjects view color names presented in various ink colors and are instructed to name the color of the ink. In incongruent stimuli, color names and ink colors are non-matching. Also includes variations such as the Counting Stroop and Emotional Stroop.

Subjective Emotional Picture Discrimination	Emotion	Subjects view pictures and are instructed to respond to emotional pictures, to indicate which pictures are pleasant/unpleasant or funny/not funny, or rate the valence of emotional pictures.
Syntactic Discrimination	Cognition.Language.Syntax	Subjects viewed grammatically correct and incorrect sentences and discriminate according to their grammar. This class also includes morphosyntactic tasks such as gender discrimination of words.
Tactile Monitor/Discrimination	Perception.Somesthesis	Subjects experience tactile/somatosensory stimulation and are asked to attend passively or discriminate according to some feature (shape, texture, same/different, frequency of presentation, etc.) Also includes: subjects are presented with 3-dimensional objects and are asked to manipulate them in their hands and probe their features.
Task Switching	Cognition.Attention	Subjects switch between performing two different tasks. Tasks include subjects responding to: color or shape of stimuli, consonants or vowels, left- or right-pointing arrows, greater or smaller, odd or even, etc.
Theory of Mind Task	Cognition.Social Cognition	Subjects are asked to perform a task involving the understanding of another's personal beliefs and feelings or forming hypotheses regarding the mental states of others.
Tone Monitor/Discrimination	Perception.Audition	Subjects are presented with tones and are instructed to listen to them passively (also coded as Passive Listening) or discriminate according to their order, timing, pitch, frequency, or amplitude.
Transcranial Magnetic Stimulation	Perception.Somesthesis	Subjects are stimulated with transcranial magnetic stimulation (TMS).
Vibrotactile Monitor/Discrimination	Perception.Somesthesis	Subjects experience vibrotactile stimulation to the hand, finger, arm, toe, or lip.
Video Games	Cognition and Emotion	Subjects play video games.

<p>Visual Distractor/Visual Attention</p>	<p>Cognition.Attention and/or Perception.Vision. Also: Various</p>	<p>This category is a catch-all for visuoattention paradigms. Examples include: subjects press a button when a visual target (letters, bars, circles, asterisks, LEDs, etc) appears; subjects detect changes in luminance, shape, or color of visual stimuli; subjects fixate on a central stimuli while ignoring peripheral distractors. Also includes cued, attention shift, and divided attention paradigms.</p>
<p>Visual Pursuit/Tracking</p>	<p>Perception.Vision.Motion</p>	<p>Subjects view a moving target(s) and track its movement across the screen. Frequently, stimuli are moving dots.</p>
<p>Whistling</p>	<p>Action.Execution</p>	<p>Subjects whistle.</p>
<p>Wisconsin Card Sorting Test</p>	<p>Cognition.Attention; Cognition.Reasoning</p>	<p>Subjects view playing cards and are required to match a target card based on 1 of 3 dimensions (color, form, or number) presented on the screen. Subjects receive feedback on their response. Once a subject has determined the correct sorting dimension, the dimension changes and the subject must update their strategy to match this change.</p>
<p>Word Generation (Covert)</p>	<p>Cognition.Language.Speech. Also, Cognition.Language.Semantic OR Cognition.Language.Orthography OR Cognition.Language.Phonology</p>	<p>SEMANTIC: Subjects listen to or view nouns and silently generate an associated verb, or subjects view a category and silently generate as many exemplars as possible. ORTHOGRAPHIC: Subjects listen to or view a letter and silently generate as many words as possible that start with that letter. PHONOLOGIC: Subjects listen to or view a word and silently generate words that rhyme.</p>

Word Generation (Overt)	Cognition.Language.Speech; Action.Execution.Speech (unless motor response is controlled for). Also, Cognition.Language.Semantic OR Cognition.Language.Orthography	SEMANTIC: Subjects listen to or view nouns and overtly generate an associated verb, or subjects view a category and overtly generate as many exemplars as possible. ORTHOGRAPHIC: Subjects listen to or view a letter and overtly generate as many words as possible that start with that letter. PHONOLOGIC: Subjects listen to or view a word and overtly generate words that rhyme.
Word Stem Completion (Covert)	Cognition.Language.Phonology; Cognition.Language.Speech	Subjects view word stems and silently generate a word that completes the stem.
Word Stem Completion (Overt)	Cognition.Language.Phonology; Cognition.Language.Speech; Action.Execution.Speech (unless motor response is controlled for).	Subjects view word stems and overtly generate a word that completes the stem.
Writing	Cognition.Language; Action.Execution (unless motor response is controlled for).	Subjects write letters or words with a pen, stylus, or their finger.