

Glossary

5HT_2A receptor: One of the many subtypes of brain ser receptors; I hypothesize that it is the only (or at least principal) ser postsynaptic receptor subtype relevant to treating mental illness.

acetylcholine: A neurotransmitter that is similar in its brain distribution to the Big Three and that may also be important for mental health. Has been implicated in learning and memory, including Alzheimer's disease. Also acts at the junction between nerves and muscles of the body.

action potential: An electrical wave that travels along the axon of a neuron, and is critical for transmitting information within and outside the brain.

acute: 1) Lasting a short period of time. 2) Very sensitive.

acute stress disorder: A post-traumatic stress disorder that occurs immediately or soon after a traumatic event.

The Adjustment: My term for a method of using pharmaceutical drugs to adjust ser and nore (and possibly dop) closer to mid-range, optimal strengths, and thereby improve quality of life for the individual.

agonist: A molecule, such as a neurotransmitter or drug, that activates a receptor.

agoraphobia: Fear of open or public places, which usually results in fear of leaving one's home.

alleles: The different varieties of a gene.

alpha 2 adrenergic agonists: Drugs that may weaken brain nore; or more specifically, may lower the brain level of nore, and possibly lower the level of nore in the rest of the body such as the heart.

alpha blockers: Drugs that may weaken brain nore by deactivating nore alpha receptors; also affect the heart.

American Psychiatric Association: A medical specialty society recognized worldwide, consisting of over 35,000 United States and international member physicians, most of whom are psychiatrists.

amygdala: An almond-shaped group of neurons in the anterior part of the temporal lobe of the brain that plays an important role in motivation and emotional behavior.

AND: My term for a system that requires that two or more components be intact in order for the system to function properly.

anorgasmia: Inability to achieve sexual orgasm.

antagonist: A molecule, such as a drug, that inactivates a receptor.

antidepressant: A drug designed to terminate depression.

antipsychotic: A drug designed to terminate psychosis (i.e., hallucinations and/or delusions). The older versions of these drugs are called typical antipsychotics, and the newer versions are called atypical antipsychotics. The typical antipsychotics deactivate dopamine receptors (and also may deactivate serotonin receptors, such as the 5HT_2A receptor), and the atypical antipsychotics deactivate dopamine and serotonin receptors (including the 5HT_2A receptor).

antisocial personality disorder: A personality disorder characterized by long-term antisocial behavior and violation of the law and the rights of others.

anxiety: A state of uneasiness or apprehension.

arrhythmia: A medical condition characterized by irregular heartbeat.

attention deficit hyperactivity disorder (ADHD): A mental illness, which usually first appears in childhood, that is characterized by inability to concentrate and hyperactivity.

atypical bipolar disorder: My term for a rare subtype of bipolar disorder that has underlying strong dop and ser, and weak nore.

atypical depression: Depression that is characterized primarily by oversleeping and overeating. I think it may be caused by weak ser and strong nore.

autism: A mental illness or developmental disorder with childhood onset that is characterized by marked deficits in communication and social interaction, preoccupation with fantasy, language impairment, and abnormal behavior.

autonomic nervous system: The part of the nervous system that regulates involuntary action, as of the intestines, heart, and glands, and that is divided into the sympathetic nervous system and the parasympathetic nervous system.

autoreceptor: A 'self' receptor; i.e., a receptor that receives neurotransmitter input from the same neuron that releases the neurotransmitter.

avoidant personality disorder: A personality disorder characterized by pervasive social inhibition, feelings of inadequacy, and hypersensitivity to negative evaluation.

axon: The tubelike portion of a neuron that generally transmits action potentials toward a synapse with another neuron or a muscle fiber.

basal ganglia: Large groups of neurons at the base of the brain involved principally in movement control.

beta blockers: Drugs that may weaken brain nore by deactivating nore beta receptors; also affect the heart.

Big Three: A term that Samuel Barondes and I have independently used to signify the neurotransmitters serotonin (ser), norepinephrine (nore), and dopamine (dop).

biogenic amines: Another name for the Big Three, as well as other brain chemicals, such as histamine, with a characteristic amine molecular structure.

biological: Concerning living things.

bipolar disorder (also known as manic-depressive illness): A mental illness characterized by episodes of mania or hypomania, that for nearly all bipolar persons is also characterized by episodes of depression.

bipolar I disorder: A subtype of bipolar disorder that is characterized by episodes of full-blown mania, and these episodes are in most cases interspersed with episodes of depression.

bipolar II disorder: A subtype of bipolar disorder that is characterized by episodes of hypomania, and these episodes are in most cases interspersed with episodes of depression; usually the depression is predominant.

block (a receptor): To deactivate a receptor with a molecule such as a drug.

borderline personality disorder: A personality disorder characterized by a long-standing pattern of instability in interpersonal relationships, behavior, mood, and self-image that can interfere with social or occupational functioning or cause extreme emotional distress.

brainstem: The portion of the brain that connects the spinal cord to the cerebral cortex.

brain freeze: My term for the mild depression and cognitive deficits that occurred when I took too high a dose of Zyprexa.

bright light therapy: A method of sitting in front of a bright light on a regular basis in order to treat seasonal affective disorder (SAD).

catatonia: A state of rigidity or flexibility of the limbs, characterized by lack of movement.

cerebral cortex: The extensive, folded layers of neurons of the cerebral hemispheres, largely responsible for higher brain functions, including sensation, voluntary movement, thought, reasoning, and memory.

cerebrospinal fluid (CSF): The extracellular fluid that bathes the brain and spinal cord.

chromosome: A large, folded strand of DNA and associated proteins.

chronic: Lasting a long period of time.

circuit: A set of synaptically interconnected neurons in the brain that form a functional unit.

clinically relevant: Of practical importance to doctors.

cocaine: The street drug that acts as a dop reuptake inhibitor, and thereby is a strengthener of dop. It may also strengthen nore in the short term, but I think it's addictive 'high' is produced solely by short-term dop boosting.

cognition: Thinking and reasoning.

congenital: Present at birth.

continuum: Existing on a range or a scale.

convergence: Connected from many to one.

corollary: A deduction or inference.

cortical: Relating to the cerebral cortex.

critical period: A window of opportunity during brain development in which a skill or function, such as language, can be acquired.

CSF: see **cerebrospinal fluid**.

D2 receptor: One of several subtypes of dop receptors; it may be the only (or at least principal) dop receptor subtype relevant to treating mental illness. It is also the site of action of some addictive drugs.

delusion: A false belief that is maintained in spite of clear evidence to the contrary.

dendrite: One of the principal synaptic receiving areas on a neuron; a single neuron usually has many dendrites.

dependent personality disorder: A personality disorder characterized by pervasive and excessive need to be taken care of.

depression: A mental illness characterized by low or despondent mood, negative thinking, lack of interest in usual activities, sleep disturbance, and eating disturbance. Also known as major depression, clinical depression, and unipolar depression.

diurnal: Within a day.

divergence: Connected from one to many.

DNA (deoxyribonucleic acid): Molecule that forms the building blocks of genetic information in the cell.

dominance: Related to the relative position of an individual in a social hierarchy or pecking order, especially the highest position in that hierarchy.

dop (dopamine): One of the Big Three neurotransmitters; I think it plays a less important role in mental illness than ser and nore.

DSM-IV-TR: The standard mental illness diagnostic text of the American Psychiatric Association.

dysfunction: Lack of proper functioning.

dysthymia: A mental illness characterized by long-term, mild depression.

eating disorder: Any of various psychological disorders, such as anorexia nervosa or bulimia, that involve insufficient or excessive food intake or digestion.

ECT (electroconvulsive therapy): Electrical stimulation of the brain that is used to treat mental illnesses, principally depression.

EEG (electroencephalography): A method for measuring electrical activity on the scalp that reflects the electrical activity of the brain.

electrical: Concerning the movement of charged particles.

endogenous: Originating from within the body; genetic or long-term environmentally influenced.

evolution: Change in the genetic composition of a population during successive generations, as a result of natural selection acting on the genetic variation among individuals, and sometimes resulting in the development of new species.

exogenous: Originating from outside the body; includes factors such as the seasons, drugs, stress, and possibly other recent environmental conditions such as sleep deprivation.

expanded dysthymia: My term that expands upon the usual definition of mild long-term depression to include a much larger fraction (perhaps over 50%) of the population who generally have not been considered to have anything wrong with them, but nonetheless have lower than possible quality of life due to non-mid-range Big Three strengths.

extracellular: Outside the cell (or neuron), or on the outer surface of the cell in the case of extracellular receptors.

FDA (Food and Drug Administration): The United States federal agency that regulates the pharmaceutical industry, among other duties.

flux: My term for a state of continuous mild depression produced by rapid (daily, weekly, or even monthly) changes in the types and dosages of Big Three drugs.

GABA: The brain's principal inhibitory neurotransmitter, in that it tends to decrease electrical activity in neurons.

gene: A particular sequence of DNA that, for most genes, encodes a protein.

generalized anxiety disorder: A long-term disorder characterized by persistent anxiety and such symptoms as tension, sweating, trembling, light-headedness, or irritability.

genetics: The science of heredity.

glutamate: The brain's principal excitatory neurotransmitter, in that it tends to increase electrical activity in neurons.

hallucination: A false sensation.

hardwired: My term for circuits in the brain whose characteristics are largely genetically determined and are not changeable.

histrionic personality disorder: A personality disorder characterized by excessive emotionality and attention-seeking behavior.

homeostasis: The ability of the body to maintain internal equilibrium by adjusting its physiological processes.

hypervigilance: The condition of maintaining an abnormally intense awareness of environmental stimuli.

hypofrontality: Decreased functioning of prefrontal cortex, resulting in inattention and impulsiveness.

hypomania: A milder version of mania characterized by elevated or irritable mood, racing thoughts, grandiose ideation, hyperactivity, and distractibility, without accompanying psychosis.

hypothalamic-pituitary-adrenal (HPA) axis: A group of related brain structures that regulate responses to stress.

hypothalamus: A group of neurons that lies below the thalamus and regulates bodily temperature, certain metabolic processes, and other autonomic activities.

hypothesis: A tentative explanation for an observation, phenomenon, or scientific problem that can be tested by further investigation.

impulse control disorders: A family of disorders, such as substance abuse, pathological gambling, and explosive anger, characterized by a tendency to gratify an immediate desire or impulse, regardless of the consequences to oneself or to others.

impulsiveness: The trait of acting on impulse rather than on careful thought.

inherited: Passed genetically from parents to offspring.

interneuron: A 'local' neuron that synaptically connects neighboring neurons.

intracellular drug: My term for a drug that acts inside of neurons, rather than on their external receptors.

intracellular signaling cascade: A series of chemical reactions that take place inside a neuron in response to a signal such as a drug or neurotransmitter; in many cases initiated by a drug or neurotransmitter binding to an external receptor.

ion channel: A molecule that allows charged particles (ions) to enter and/or leave neurons.

isomorphic: Literally, 'same form'. Here it means that the neural representation of a sensory stimulus in the brain takes the same form as the stimulus itself.

limbic system: A group of interconnected deep brain structures involved in smell, emotion, motivation, behavior, memory, and various autonomic functions.

linear system: A system in which the whole is equal to the sum of its parts.

LSD (lysergic acid diethylamide): The hallucinogenic street drug that I hypothesize to be a deactivator or weak activator of the ser 5HT_{2A} receptor.

major depression: A formal name for depression.

mammals: A class of warm-blooded vertebrate animals that give birth to live young; includes humans, monkeys, and rodents.

mania: A condition characterized by markedly elevated or irritable mood, racing thoughts, grandiose ideation, hyperactivity, and distractibility, often with accompanying psychosis.

manic-depressive illness: see **bipolar disorder**.

megalomania: A preoccupation with grandiose or extravagant things or actions.

metabolize: To engage bodily processes in breaking down more complex molecules into simpler molecules, such as in the inactivation of drugs.

mixed mood: A condition in which someone exhibits both manic (or hypomanic) and depressed symptoms simultaneously.

molecule: An interconnected group of atoms that has distinct chemical properties.

mood: A baseline state of how one feels, whereas emotions are alterations produced by stimuli, such as sensory perceptions or memories, and are superimposed upon mood.

mood stabilizer: A drug that diminishes the magnitude and/or frequency of manic (or hypomanic) and depressive episodes in persons with bipolar disorder.

MRI (magnetic resonance imaging): A noninvasive diagnostic technique that produces computerized images of internal body tissues.

narcissistic personality disorder: A personality disorder characterized by excessive love or admiration of oneself, and extreme disregard for the feelings of others.

neural integrator hypothesis: My term for a circuit or group of circuits in the brain that is acted upon by the Big Three and controls a number of Big Three traits simultaneously, such as mood, emotion, sensory acuity, and others.

neuron: A cell in the nervous system that is capable of conducting electrical signals, and usually consists of a cell body, multiple dendrites, and a single axon, and is synaptically connected with other cells, within or outside the brain.

neurophysiology: The branch of neuroscience that studies the chemical properties of neurons, including their electrical properties.

neuroscience: The branch of science that studies the nervous system, including the brain.

neurotransmitter: A signaling molecule that is used for synaptic communication between neurons. It is typically released into the synapse by a neuron and binds to external receptors on the same or other neurons.

niche: 1) The function or position of an organism within an ecological community. 2) A special area of demand.

nonlinear system: A system in which the whole is not equal to the sum of its parts.

nore (norepinephrine): One of the Big Three neurotransmitters; relative to other neurotransmitters, I think it and ser play the most important roles in mental illness.

NREM (non-rapid eye movement) sleep: A recurring sleep state during which rapid eye movements do not occur and dreaming does not occur or is less vivid; accounts for about 75% of normal sleep time.

NRIs (noreuptake inhibitors): Drugs that boost the level of nore in the brain. Include some of the tricyclic antidepressants, reboxetine, and Strattera.

object recognition: The ability to recognize familiar objects; a type of pattern recognition.

obsessive-compulsive disorder (OCD): A mental illness in which the person is beset with obsessions (recurrent thoughts) or compulsions (strong impulses to act) or both, and suffers extreme anxiety or depression if he or she fails to think the obsessive thoughts or perform the compelling acts.

obsessive-compulsive personality disorder: A personality disorder characterized by a preoccupation with orderliness, perfectionism, and mental and interpersonal control.

OR: My term for a system that requires that only one of two or more components be intact in order for the system to function properly.

overt mental illnesses: My term for the mental illnesses listed in the *DSM-IV-TR*.

panic attack: The sudden onset of intense anxiety, characterized by feelings of intense fear and accompanied by palpitations, shortness of breath, sweating, and trembling.

panic disorder: A disorder characterized by recurrent panic attacks and usually resulting in the development of one or more phobias, such as agoraphobia. It can be associated with a specific situational trigger.

parallel processing: The simultaneous processing of multiple types of information by multiple brain circuits.

paranoia: Extreme, irrational distrust of others.

paranoid personality disorder: A personality disorder characterized by consistent extreme and irrational distrust of others.

pattern recognition: The ability to recognize familiar patterns of stimuli, such as objects.

perception: The manner in which one experiences the world, including through the five senses.

peripheral nervous system: The part of the vertebrate nervous system constituting the nerves outside the central nervous system and including the cranial nerves, spinal nerves, and the autonomic nervous system.

permissive hypothesis: Theory that weak ser permits induction of full-blown mania in bipolar persons.

personality disorders: A group of disorders in which patterns of perceiving, relating to, and thinking about oneself and one's environment interfere with the long-term functioning of the individual, often manifested in deviant behavior and lifestyle.

PET (positron emission tomography): A noninvasive diagnostic technique that produces computerized images of internal body tissues.

pharmaceutical: A legal drug that is used to treat medical illnesses.

pharmacology: The science of drugs, including their composition, uses, and effects.

phenotype: The observable physical or biochemical characteristics of an organism, as determined by both genetic makeup and environmental influences.

placebo: A pill containing no active drug.

plasticity: The ability of the brain to change itself, usually in response to inputs.

pleiotropy: The control by a single gene of several distinct and seemingly unrelated phenotypic effects.

postsynaptic: Literally, 'after the synapse'. Related to receiving input from the presynaptic neuron.

Post-traumatic stress disorder (PTSD): A disorder affecting some individuals who have experienced or witnessed profoundly traumatic events, such as torture, murder, rape, or wartime combat, characterized by recurrent flashbacks of the traumatic event, nightmares, irritability, anxiety, fatigue, forgetfulness, and social withdrawal.

prefrontal cortex: Anterior portion of the cerebral cortex that is involved in cognition, emotion, and short-term memory.

presynaptic: Literally, 'before the synapse'. Related to sending input to the postsynaptic neuron.

proteins: Molecular chains of amino acids, with distinct chemical properties, that play a critical role in cellular function.

psychiatry: The branch of medicine that deals with the diagnosis, treatment, and prevention of mental illnesses.

psychology: The science that deals with mental processes and behavior.

psychophysics: The branch of psychology aimed at experimentally measuring properties of sensory perception.

psychosis: A mental condition characterized by hallucinations and/or delusions and/or thought disorder; occurs during some cases of schizophrenia, mania, and depression.

rapid (mood) cycling: Bipolar disorder that is characterized by four or more episodes of mania, hypomania, mixed mood, or depression within a 12 month period.

receptor: A cellular molecule that is capable of binding and responding to a signaling molecule such as a neurotransmitter or drug.

reinforcement of behavior: A positive or negative stimulus that strengthens or weakens the behavior that produced it.

rejection sensitivity: A trait of being extremely sensitive to social or interpersonal slights.

REM sleep: A stage in the normal sleep cycle during which most dreams occur and the body undergoes marked changes including rapid eye movement, loss of reflexes, and increased pulse rate and brain activity.

SAD (seasonal affective disorder): A form of depression occurring during certain seasons of the year, usually wintertime.

safety factor: My term for when the synaptic level of a neurotransmitter exceeds the point of saturation for its receptor population by a certain amount.

schizoid personality disorder: A personality disorder characterized by a pervasive pattern of detachment from social relationships and a restricted range of expression of emotions.

schizophrenia: A mental illness characterized by so-called positive symptoms (hallucinations, delusions, disjointed thought patterns) as well as so-called negative symptoms (apathy, social withdrawal, poverty of thought).

schizotypal personality disorder: A personality disorder characterized by a pervasive pattern of social and interpersonal deficits, as well as cognitive or perceptual distortions and eccentricities of behavior.

searching: My term for continuously altering one's lifestyle—significant other, job, hobbies, place of residence, etc.—to find contentedness, which one never quite achieves.

ser (serotonin): One of the Big Three neurotransmitters; relative to other neurotransmitters, I think it and nore play the most important roles in mental illness.

serial processing: The sequential processing of information within a single brain circuit.

social phobia: Extreme, debilitating fear associated with situations in which one is potentially subject to criticism by others.

specific phobias: Disorders characterized by marked and persistent fear of specific objects or situations.

SPECT (single photon emission computed tomography): A noninvasive technique for imaging brain structures.

SRI (ser reuptake inhibitors): Drugs that boost the level of ser in the brain. Examples include Prozac, Zoloft, Paxil, Lexapro, and Luvox.

strength (of the Big Three): My term which means the extracellular level of the neurotransmitter plus the sensitivity of the brain circuitry to that level.

synapse: The place at which an electrical signal (usually an action potential) passes from one neuron to another.

systemic: Throughout the body.

tardive dyskinesia: A potentially irreversible movement disorder, characterized by tics and other involuntary movements, that is sometimes caused by the typical antipsychotics.

thalamus: The mass of neurons that lies between the brainstem and cerebral cortex, that essentially serves as a relay for electrical information to and from the cerebral cortex.

threshold: The point that must be crossed to produce a given effect.

Tourette's syndrome: A disorder characterized by facial and other body tics, usually beginning in childhood and often accompanied by grunts and compulsive utterances, such as interjections and obscenities.

transmitter: My abbreviation for 'neurotransmitter'.

The Triangle: My term for the putative, long-term strength interactions that occur between the Big Three.

tricyclic antidepressants: A class of drugs that boost nore, where some of these drugs boost ser as well. The tricyclic NRIs are desipramine, nortriptyline, and protriptyline.

typical bipolar disorder: My term for a common subtype of bipolar disorder that has underlying strong dop and nore, and weak ser.

unipolar depression: A fancy term for depression that is not accompanied by additional episodes of mania, hypomania, or mixed mood states.

utilitarianism: The philosophical principle that one's actions should produce the greatest good for the greatest number of people.

weltschmerz: The philosophical principle of sorrow over the perceived present or future evils or woes of the world in general; sentimental pessimism.