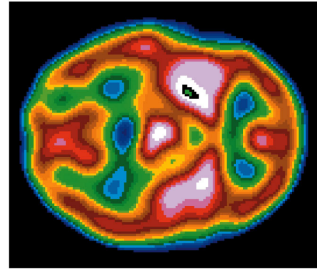
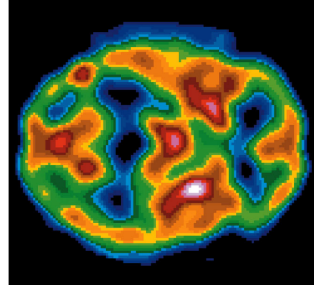


(a) Manic



(b) Depressive



Class 26 -- Physiological Psychology
Dec 3, 2015
Psychopathology

Please contact Sam Y as soon as possible if you want to look over old exams before the Final. Since people were not coming to office hours, she is doing appointments to review exams by email arrangement on an individual basis. Don't wait until the last minute!

Tues Dec 8 – **Cumulative make-up exam** (use old Study Guides 1-4, plus additional Study Guide 5 for last 2 lectures. Study Guide 5 will be posted after class today).

Thurs Dec 10 – Last class, **full cumulative Review** with sample questions. **No slides will be posted**, so if you want to see questions you have to come to class.

Fri Dec 18, **Final exam**, 10:30AM, LH 101 (same room)

For those with **bunched finals or similar issues**, I am offering an alternate final on **Thurs Dec 17 from 12:30-3:30p** (“drop-in” start time 12:30p). **Come To my office, rm 113 BOUS.**

I ***technically*** need approval from the *Dean of Students* to administer the final at this alternate time, so be sure to visit that office and get an Approval (an email with your name will be sent to me).

Again, the alternate final is only for students with DOS approval and/or that contact me in advance.

A limited selection of psychopathologies....

Psychotic Disorders (Psychosis)	Mood Disorders	Anxiety/ Phobic Disorders	Substance Abuse and Addictions	Personality Disorders (generally less severe)
Schizophrenia	Depressive Manic Bi-polar	Agoraphobia Other phobias Panic attacks Anxiety disorder OCD PTSD	Drug abuse Alcohol abuse	Cluster A (odd/ eccentric) •Paranoid •Schizoid •Schizotypal •Cluster B (dramatic, emotional, or erratic) •Antisocial •Borderline •Histrionic •Narcissistic Cluster C (anxious or fearful) •Avoidant •Dependent •Obsessive-compulsive personality disorder (not the same as Obsessive-compulsive disorder)

Schizophrenia -- a psychiatric diagnosis that describes a mental illness characterized by distortions in the perception or expression of reality -- most commonly including auditory hallucinations, paranoid or bizarre delusions, or disorganized speech and thinking. Onset of symptoms usually occurs in early 20's for males and early 30's for females, with about 0.4–0.6% of the population affected. Studies suggest that genetics, prenatal factors (stress, teratogens), neurobiology, and environment (e.g., rate is double in urban versus rural environments, probably due to stimulation and stress) are important factors. Pregnancy can trigger symptoms in women.

Diagnosis is based on the patient's self-reported experiences and observed behavior, as well as duration of symptoms. Slightly more common in men.

No laboratory test for schizophrenia exists.

TABLE 16.2 Symptoms of Schizophrenia

Positive symptoms	Negative symptoms
Hallucinations, most often auditory	Social withdrawal
Delusions of grandeur, persecution, etc.	Flat affect (blunted emotional responses)
Disordered thought processes	Anhedonia (loss of pleasurable feelings)
Bizarre behaviors	Reduced motivation, poor focus on tasks
	Alogia (reduced speech output)
	Catatonia (reduced movement)

Biological Psychology 6e, Table 16.2

© 2010 Sinauer Associates, Inc.

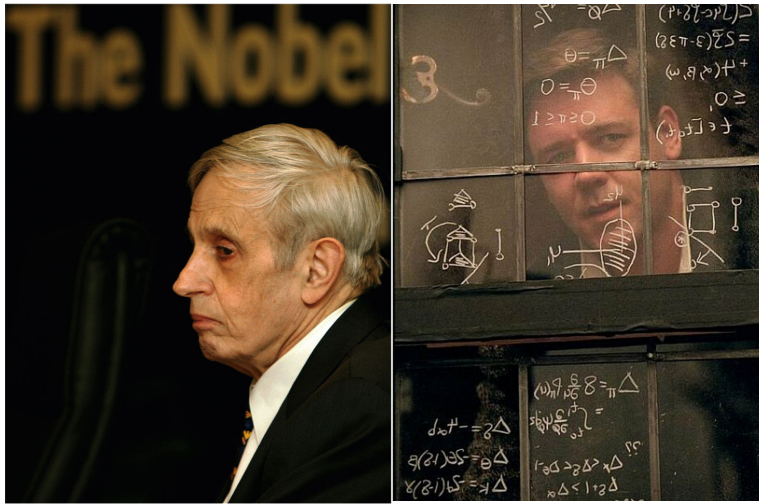
Segment 75

Hallucinations: A Clinical Picture

Length: 3:10

Source: *Madness: In Two Minds* (BBC Worldwide Americas Inc.)

Figure 16.1 Not So Beautiful Voices



Psychology 5e, Figure 16.1

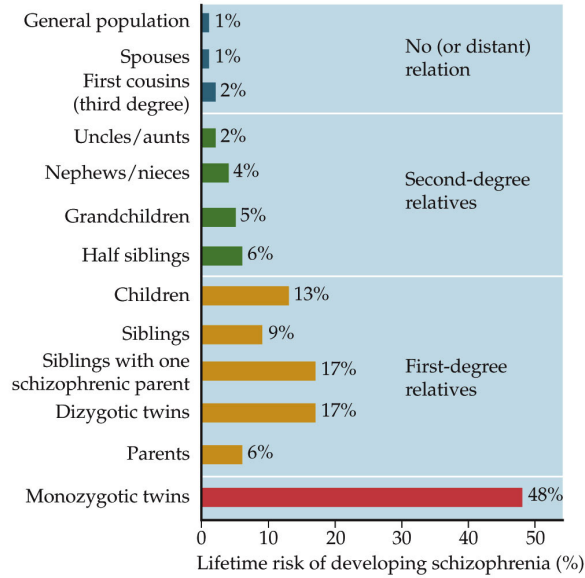
© 2007 S

John Nash, a Nobel-prize winning mathematician, experienced auditory hallucinations that fueled his paranoia, portrayed in the movie “*A Beautiful Mind*.”

What it feels like to have schizophrenia.....

Janssen

Figure 16.2 The Heritability of Schizophrenia



Biological Psychology 6e, Figure 16.2

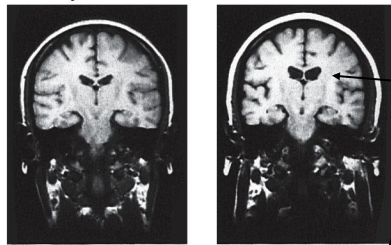
© 2010 Sinauer Associates, Inc.

Strong heritability component in schizophrenia, but not 100%.

Figure 16.5 Identical Genes, Different Fates

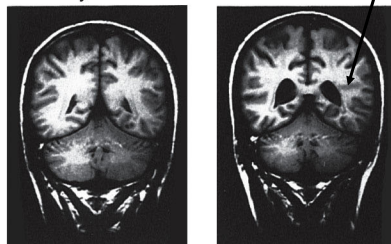
MRI brain images of twins discordant for schizophrenia

35-year-old female identical twins



Schizophrenics have *enlarged ventricles*, which is consistent with other evidence of brain abnormalities (e.g., excess pruning in teen years).

28-year-old male identical twins



Reductions in *hippocampus* size, & tissue abnormalities, are also seen in schizophrenics.

Figure 16.7 Cellular Disarray of the Hippocampus in Chronic Schizophrenia

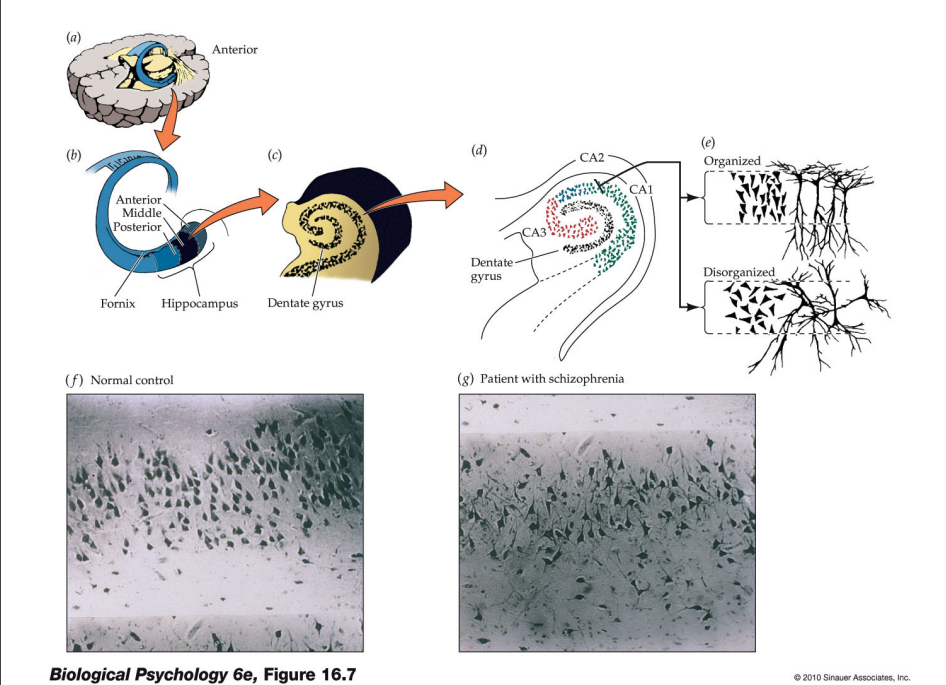
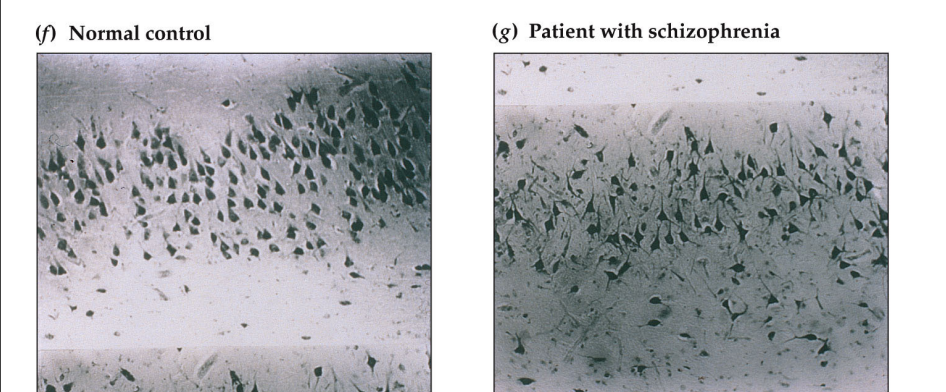


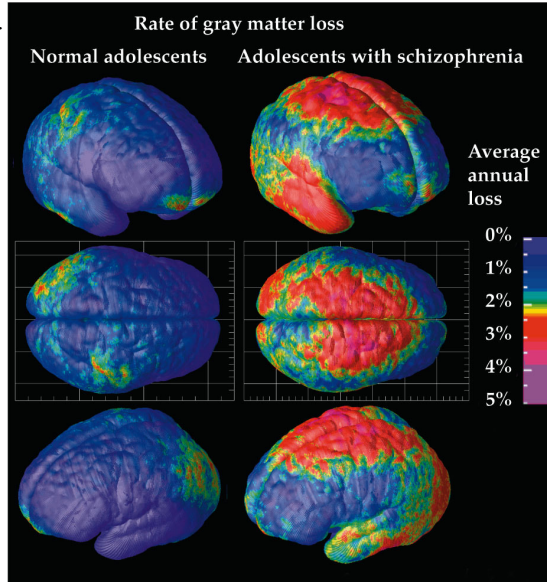
Figure 16.6 Cellular Disarray of the Hippocampus in Chronic Schizophrenia (Part 3)



These neural anomalies probably arise during early development, when *neuromigration* is taking place (last trimester). This probably means that “schizophrenia” is present at birth – yet because it is not usually expressed until adulthood, it is NOT called a developmental disability. (Childhood schizophrenia is a rare exception). We do *not* know what triggers the first “psychotic break” in young adults (hormones? stress? Pregnancy raises risk of “first break” in women).

Figure 16.7 Accelerated Loss of Gray Matter in Adolescents with Schizophrenia

Abnormal rate of grey matter loss in schizophrenic teens (*too much* pruning).

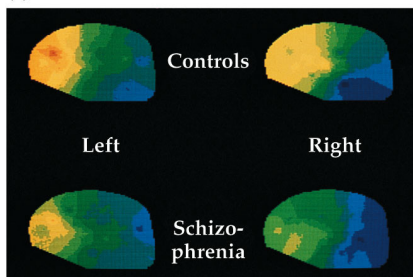


Psychology 6e, Figure 16.8

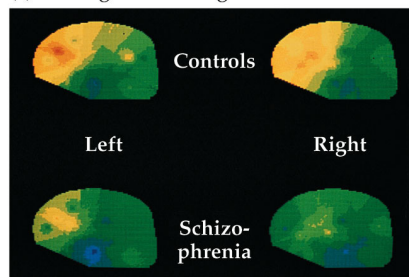
Figure 16.9 Hypofrontality in Schizophrenia

Reduced frontal lobe function in schizophrenia.

(a) At rest



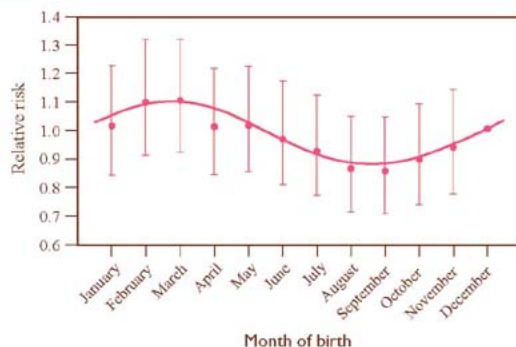
(b) During card-sorting task



This is consistent with impairments in frontal cortical tasks such as maintaining attention, or making “executive” decisions (e.g., what is appropriate to say in a given situation).

(The card-sorting task used here is also an Executive task).

**RELATIVE RISK OF SCHIZOPHRENIA
ACCORDING TO MONTH OF BIRTH**



Rates of schizophrenia are highest for babies born in winter/early spring (shorter days) in the N hemisphere, which could indicate that **reduced sunlight** during the latter part of gestation (last trimester) may increase risk. Other theories focus on maternal viral infections (flu season) as a risk factor.

Figure 16.9 Antipsychotic Drugs That Affect Dopamine Receptors

The **dopamine hypothesis of schizophrenia** proposed overactive mesolimbocortical dopamine pathways as the cause of (the positive symptoms of) schizophrenia, leading to the use of potent D2 dopamine-blockers called *typical antipsychotics*.

Newer medication (*atypical antipsychotics*) can be equally effective as typical antipsychotics, but have less of a dopamine blocking effect.

These also improve negative symptoms and have fewer *Parkinsonian* side effects.

Purple=D2

Green=Serotonin

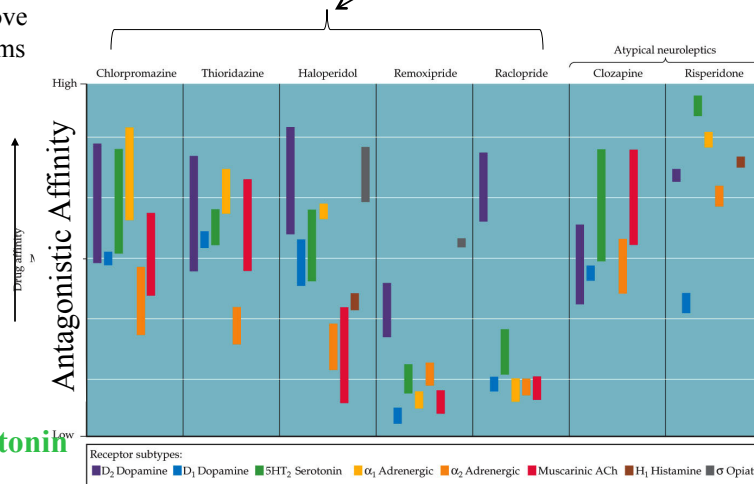
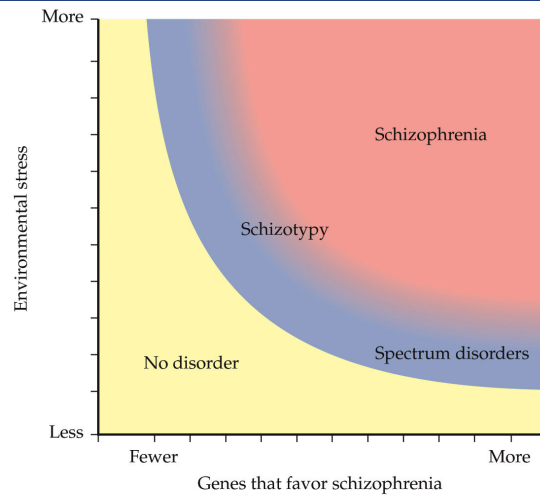


Figure 16.12 A Model of the Interaction between Stress and Genetic Influences in Schizophrenia



Biological Psychology 6e, Figure 16.12

© 2010 Sinauer Associates, Inc.

This model of *synergistic environmental/genetic risk factors* probably applies to *many* disorders that have a heritability component that is not 100%, coupled with other known risk factors (e.g., dyslexia, autism, depression).

Depression (or major depressive disorder)--

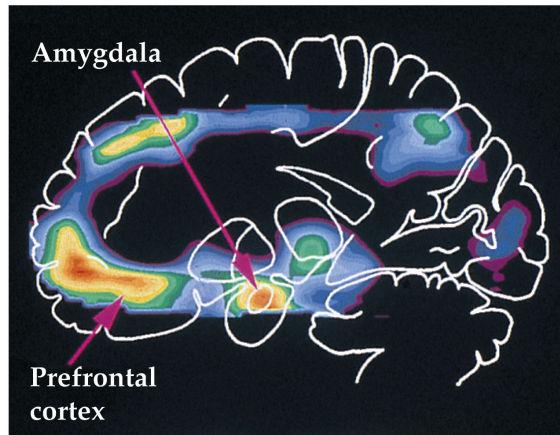
More than just feeling "blue" for a few days, depression is feeling "down" and "low" and "hopeless" for weeks at a time (or longer). About 20 million people in the US have symptoms of depression. It can run in families, and usually starts between the ages of 15 and 30. It is much more common in women. Women can also get postpartum depression after the birth of a baby. Some people get seasonal affective disorder in the winter. Depression is one part of bipolar disorder.

Signs & Symptoms

- * Persistent sad, anxious, or "empty" mood
- * Feelings of hopelessness, pessimism
- * Feelings of guilt, worthlessness, helplessness
- * Loss of interest or pleasure in hobbies and activities once enjoyed

Figure 16.13 Brain Activity Patterns in Depression

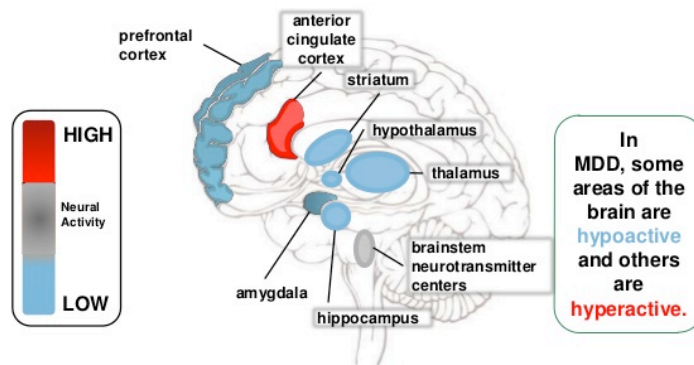
Data from PET scans in your textbook suggested *increased* activity in the frontal cortex and amygdala of depressed patients compared to controls *but there is debate on these results.*



Biological Psychology 6e, Figure 16.13

© 2010 Sinauer Associates, Inc.

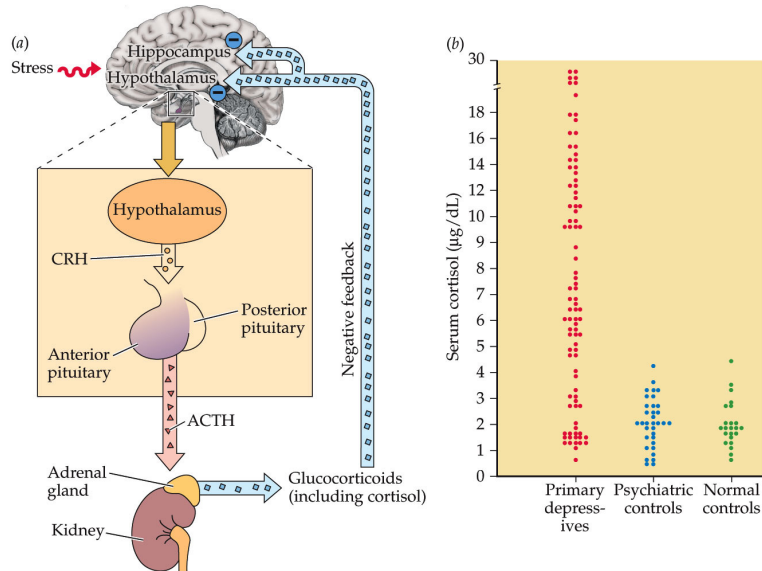
Major Depressive Disorder



Yes, these results are somewhat opposite of the ones on the last slide. This shows how results can conflict – subjects can be tested under different conditions, using different tasks, on or off medications, and using different diagnostic criteria. All this makes neuropsychiatric research VERY difficult to replicate and integrate across labs and studies. Importantly, more recent findings still implicate *largely the same brain areas in depression.*

Figure 16.14 The Hypothalamic–Pituitary–Adrenal Axis in Depression (Part 1)

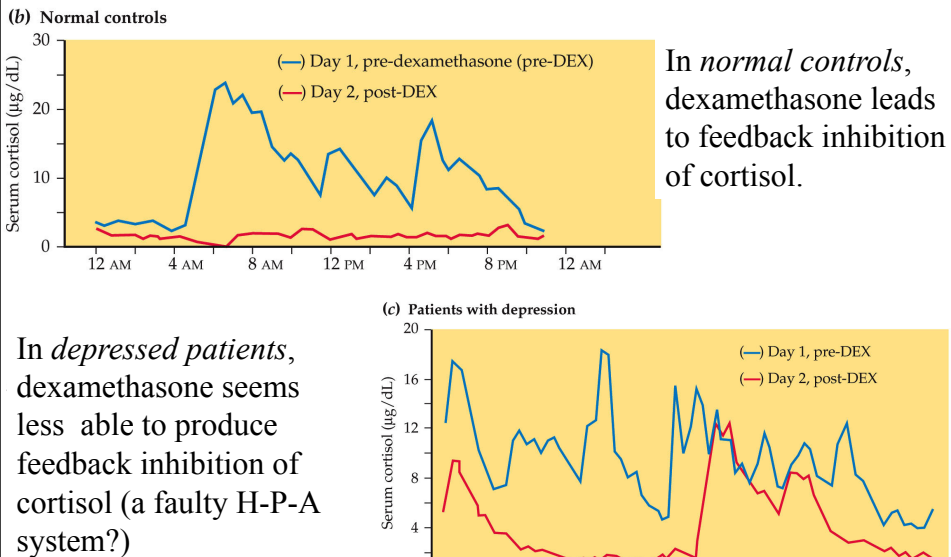
Higher cortisol (stress) levels in depressed individuals.



Biological Psychology 6e, Figure 16.14 (Part 1)

© 2010 Sinauer Associates, Inc.

Figure 16.14 The Hypothalamic–Pituitary–Adrenal Axis in Depression (Part 2 & 3)

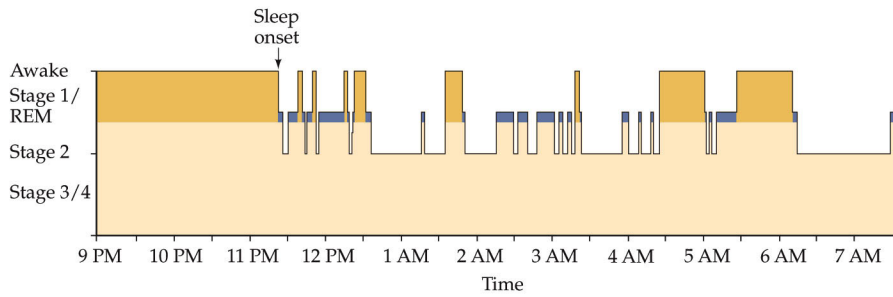


Biological Psychology 6e, Figure 16.13 (Part 3)

© 2007 Sinauer Associates, Inc.

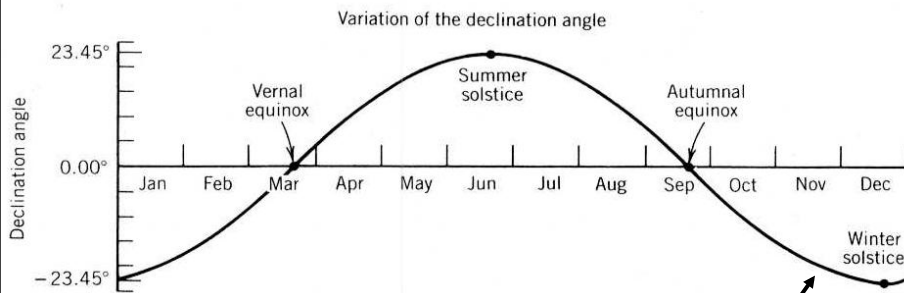
Figure 16.15 Sleep and Depression (Part 1)

(a) Sleep pattern of a patient with depression



Depressed patients spend little/no time in deep (stage 3/4) sleep (remember that cortisol levels normally *fall* during the night and *rise* just before we wake up, but may *remain* elevated in depressed patients).

Human annual rhythms?



Seasonal affective disorder, also known as winter depression, is an affective, or mood, disorder. Most SAD sufferers experience normal mental health throughout most of the year, but experience depressive symptoms in the winter (or summer). The condition in the summer is often referred to as **Reverse Seasonal Affective Disorder**.



Box 16.2 The Season to Be Depressed



Light therapy for SAD

Biological Psychology 6e, Box 16.2

© 2010 Sinauer Associates, Inc.

TABLE 16.3 Drugs Used to Treat Depression

Drug class	Mechanism of action	Examples ^a
Monoamine oxidase (MAO) inhibitors	Inhibit the enzyme monoamine oxidase, which breaks down serotonin, norepinephrine, and dopamine	Marplan, Nardil, Parnate
Tricyclics and heterocyclics	Inhibit the reuptake of norepinephrine, serotonin, and/or dopamine	Elavil, Wellbutrin, Aventyl, Ludiomil, Norpramin
Selective serotonin reuptake inhibitors (SSRIs)	Block the reuptake of serotonin, having little effect on norepinephrine or dopamine synapses	Prozac, Paxil, Zoloft

^aWe give here the more commonly used trade names rather than chemical names.

Newer developments— dopamine/norepinephrine agonists such as “Bupropion”, or SSRI/norepinephrine agonist hybrids like “Cymbalta.”

Current thinking indicates that “depression” may include two major types – anxiety-based, and motivation-based. The former may respond well to SSRI’s. The latter may respond better to other monoamine agonists like Wellbutrin, or Bupropion.

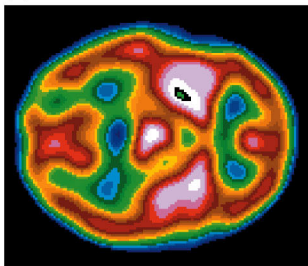
Bi-polar or Manic-Depressive Disorders

Bipolar disorder, also known as manic-depressive illness, is a brain disorder that causes unusual shifts in a person's mood, energy, and ability to function. Different from the normal ups and downs that everyone goes through, the symptoms of bipolar disorder are severe. They can result in damaged relationships, poor job or school performance, and even suicide.

About 5.7 million American adults (or about 2.6 percent of the population) age 18 and older in any given year have bipolar disorder. Bipolar disorder typically develops in late adolescence or early adulthood. However, some people have their first symptoms during childhood, and some develop them late in life. It is often not recognized as an illness, and people may suffer for years before it is properly diagnosed and treated.

Figure 16.16 Functional Images of Bipolar Disorder

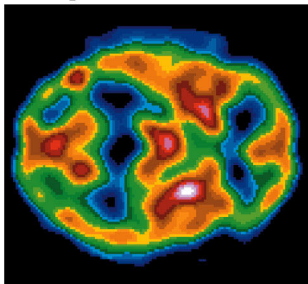
(a) Manic



There is a *genetic component* to bi-polar disorder, but again not 100% heritability.

Patients with bi-polar again have *enlarged ventricles*, which again probably indicates other brain abnormalities not yet identified.

(b) Depressive



Bi-polar is treated with mood stabilizers like *lithium*, but compliance can be a problem, most often because patients believe that they are fine (also a problem for compliance in schizophrenia).

16.15

Obsessive-Compulsive Disorders -- a psychiatric anxiety disorder most commonly characterized by a subject's obsessive, distressing, intrusive thoughts and related compulsions (tasks or "rituals") which attempt to neutralize the obsessions.

The phrase "obsessive-compulsive" has worked its way into our casual vocabulary, and is often used in an offhand manner to describe someone who is meticulous or absorbed in a cause (see also "anal-retentive"). Such casual references should not be confused with obsessive-compulsive disorder. It is also important to distinguish OCD from other types of anxiety, including the routine tension and stress that appear throughout life. Although these signs are often present in OCD, a person who shows signs of fixation with a subject/object, or displays traits such as perfectionism, does not necessarily have OCD, a specific and well-defined condition.

Symptoms	Percentage of patients
OBSESSIONS	
Dirt, germs, or environmental toxins	40
Something terrible happening (fire, death or illness of self or loved one)	24
Symmetry, order, or exactness	17
Religious obsessions	13
Body wastes or secretions (urine, stool, saliva)	8
Lucky or unlucky numbers	8
Forbidden, aggressive, or perverse sexual thoughts, images, or impulses	4
Fear of harming self or others	4
Household items	3
Intrusive nonsense sounds, words, or music	1
Symptoms	
COMPULSIONS	
Performing excessive or ritualized hand washing, showering, bathing, tooth brushing, or grooming	85
Repeating rituals (going in or out of a door, getting up from or sitting down on a chair)	51
Checking (doors, locks, stove, appliances, emergency brake on car, paper route, homework)	46
Engaging in miscellaneous rituals (such as writing, moving, speaking)	26
Removing contaminants from contacts	23
Touching	20
Counting	18
Ordering or arranging	17
Preventing harm to self or others	16
Hoarding or collecting	11
Cleaning household or inanimate objects	6

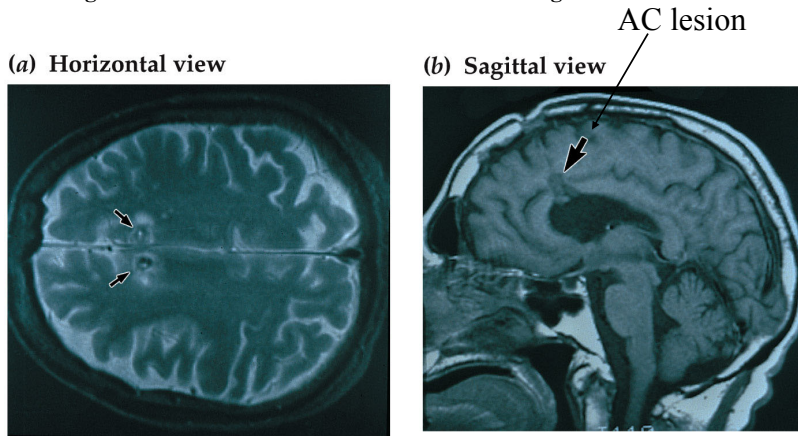
The *neuropathology of OCD* is believed to involve over-activity in the corticostriatal circuit -- comprised of the **orbitofrontal cortex, the caudate nucleus, the pallidum, the thalamus, and the anterior cingulate cortex.**

Drug treatments for OCD focus on medications in two different categories -- the tricyclic antidepressants (benzodiazepines) & several of the selective serotonin reuptake inhibitors, or SSRIs (such as Prozac, Luvox, and Zoloft). These medications help increase the brain's balance of serotonin -- a chemical linked to OCD.

Figure 16.19 Neurosurgery to Treat Obsessive–Compulsive Disorder

Another psychosurgical treatment used for OCD in the United States involves the use of radio-frequency waves to destroy a small amount of brain tissue, which disrupts a specific circuit in the brain that has been implicated in OCD (the *corticostriatal circuit*).

Possible surgeries include small lesions of the anterior cingulate cortex.



Post Traumatic Stress Disorder

An anxiety disorder that can develop after exposure to a terrifying event or ordeal in which grave physical harm occurred or was threatened. It is a severe and ongoing emotional reaction to an extreme psychological trauma. This stressor may involve someone's actual death, or a threat to the patient's or someone else's life, serious physical injury, or threat to physical and/or psychological integrity -- to a degree that usual psychological defenses are incapable of coping.

PTSD is most often seen in Veterans. Formerly it was known as battle fatigue (WWI), shell shock (WWII) or traumatic war neurosis or post-traumatic stress syndrome (PTSS; Vietnam, Korea).

But PTSD is not seen *only* in Veterans, it can be seen in victims of violent crime (particularly rape), or witnesses to horrific accidents.

Actual brain changes can be seen in PTSD patients.

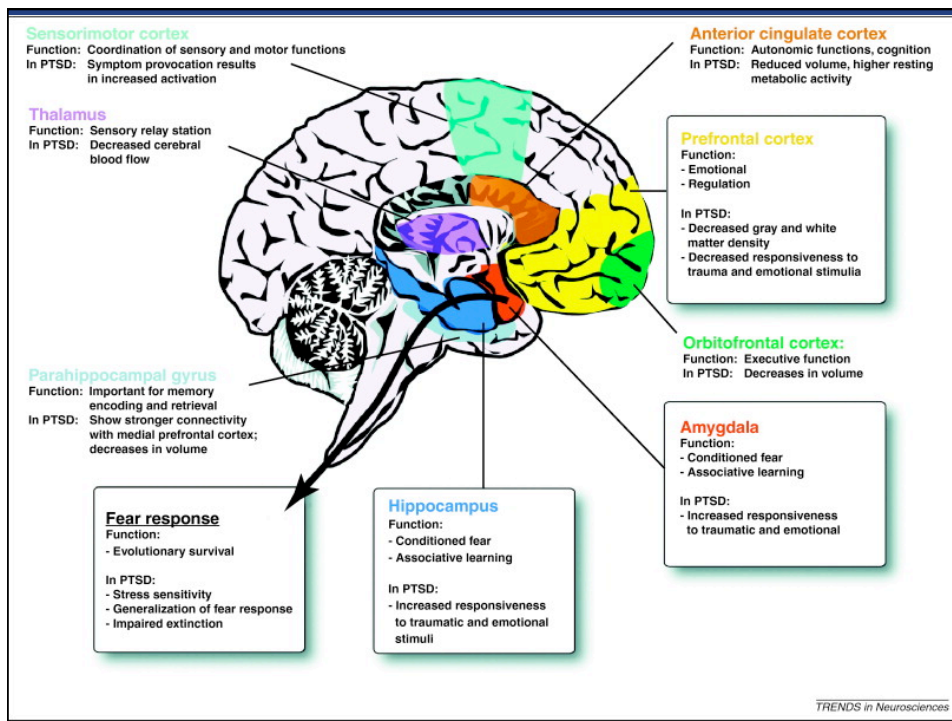
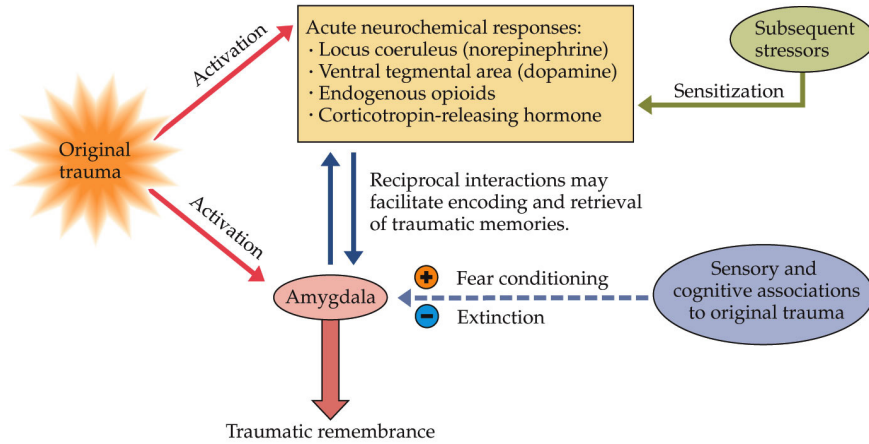


Figure 16.18 A Neural Model of Posttraumatic Stress Disorder



Biological Psychology 6e, Figure 16.18

© 2010 Sinauer Associates, Inc.



Individuals with PTSD only showed strong brain activation for *fearful and angry* faces using fMRI.

Brain Region	Within Groups	
	Control	PTSD
Amygdala	Happy Sad Fearful Angry	Fearful Angry
Medial Frontal/Anterior Cingulate	Happy Sad Fearful Angry	Angry
Orbital Frontal	Happy Sad Angry	Angry



“Virtual Iraq” -- PTSD therapy for Veterans

