

**Biopsychosocial Approach to  
Psychopathology**

<http://daphne.palomar.edu/frose/abnormal/>

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**“For the longest time,  
Psychology had no brain.  
Now it’s lost its mind”**

**Unknown**

**The mind-body dualism is no longer a tenable theory**

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**Multidimensional Model of  
Abnormal Behavior**

- Biological Influences
- Behavioral Influences
- Emotional Influences
- Social Influences
- Developmental Influences

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## Multidimensional Approach

- Posttraumatic Stress Disorder (PTSD)
  - Biological:
    - Familial history of depression and anxiety suggests genetics
    - Extreme autonomic (sympathetic) arousal
    - Hippocampal hypertrophy
  - Psychological
    - Psychological vulnerability due to experience (esp. at low levels of trauma)
    - High fear response to trauma
  - Social
    - Lower education
    - Ethnic minority
    - Familial instability
    - No support




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## Genetic Contributions to Psychopathology

- Phenotype vs. Genotype
- Development and behavior is typically polygenic
  - GTF2i and sociability
- Genetic Contribution to Psychopathology Less than 50%

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## Genetic Contributions

- Reaction Range: Degree of potential environmental determined by heredity; actual is determined by environment




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## The Interaction of Genetic and Environmental Effects

- The Diathesis-Stress Model
  - “Diathesis” = susceptibility to develop a disorder
  - Susceptibility is activated under conditions of stress
  - Examples: Blood-injury-injection phobia, alcoholism, animal aggression
  - Oversimplified

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## The Interaction of Genetic and Environmental Effects

- Reciprocal Gene-Environment Model
  - Personality traits influence environmental exposure to particular stressors: passive, evocative, active (Scarr, 1993)
  - Examples: Depression, impulsivity
- Non-Genomic Inheritance of Behavior
  - Biology is not destiny

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## Gene-Environment Interaction

- Suomi and colleagues
  - Serotonin Transporter Gene (5-HTT)
    - Long allele - normal variant
    - Short allele - less typical variant
  - Given serotonin’s effect on mood and behavior, hypothesized variations in genotype will alter social behavior
  - Population: Rhesus Macaques



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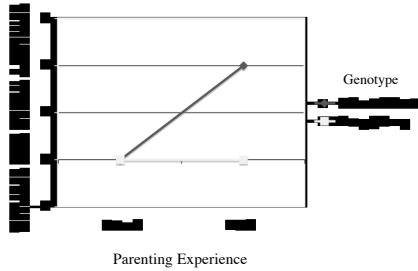
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## Gene-Environment Interaction



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## Gene-Environment Interaction

- Conclusions from Suomi et al.
  - The effects of 5-HTT allele variation depends upon environmental stressors
  - Short allele homozygosity increases negative (aggressive) behavior in Rhesus macaques if, and only if, the animal experiences early stress.
- Not known if same affect would be seen in humans

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## Gene-Environment Interaction

- Caspi, et al. (2003) - 5-HTT effects with Humans
  - Epidemiological study followed individuals with L / L, L / S, and S/S allele combinations of 5-HTT

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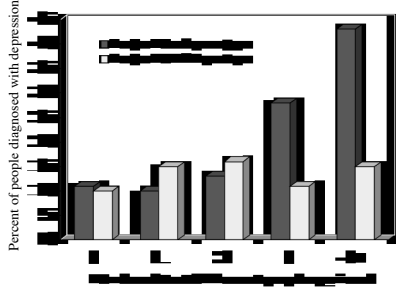
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## Gene-Environment Interaction



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## Gene-Environment Interaction

- Conclusions
  - The nature/nurture debate was oversimplified and is largely a nonissue
  - There is growing evidence that genes and the environment *interact*, in the truest sense of the word, to influence behavior
  - Mental health professionals must take a biopsychosocial perspective

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## Neuroscience Contributions to Psychopathology

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## Neuroscience and Brain Structure

- Lobes of Cerebral Cortex
  - Frontal – Thinking and reasoning abilities, memory
  - Parietal – Touch recognition
  - Occipital – Integrates visual input
  - Temporal – Recognition of sights and sounds, long-term memory storage

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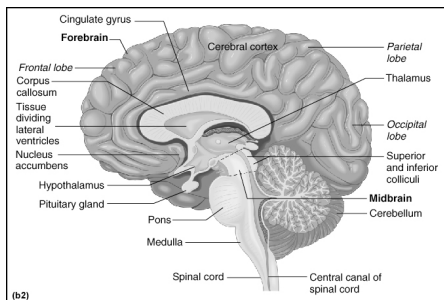
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### Neuroscience and the Divisions of the Brain (cont.)



Major structures of the brain

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## Neuroscience and Brain Structure

- Limbic System
  - Thalamus – Receives and integrates sensory information
  - Hypothalamus – Controls eating, drinking, aggression, sexual activity
  - Amygdala - Survival relevant info
  - Hippocampus - memory and learning
  - Cingulate - “brakes”, emotions, social behavior

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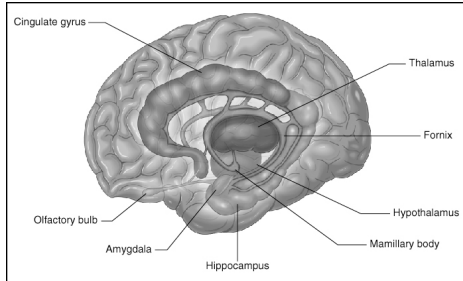
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Neuroscience and the Brain Structure (cont.)



The limbic system

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## Major Neurotransmitters in Psychopathology

- Functions of Neurotransmitters
  - Agonists, antagonists, and inverse agonists
  - Most drugs are either agnostic or antagonistic
- Main Types of Neurotransmitters
  - Serotonin (5HT) - widespread; regulates mood and thought
  - Gamma aminobutyric acid (GABA) - inhibitory; anxiolytic
  - Norepinephrine - excitatory; "fight or flight" response
  - Dopamine - gatekeeper; increases environmental interactivity

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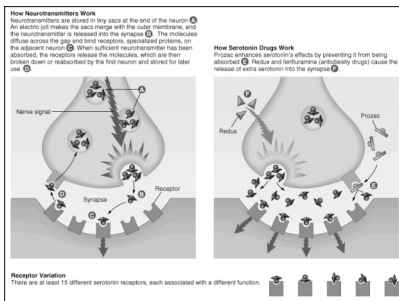
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## Neuroscience: Functions of Main Types of Neurotransmitters (cont.)



Manipulating serotonin in the brain

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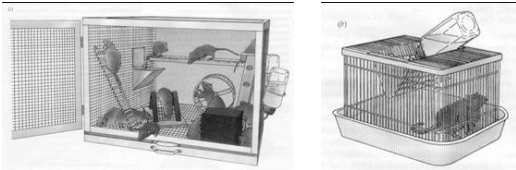
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## Environment Affects Biology



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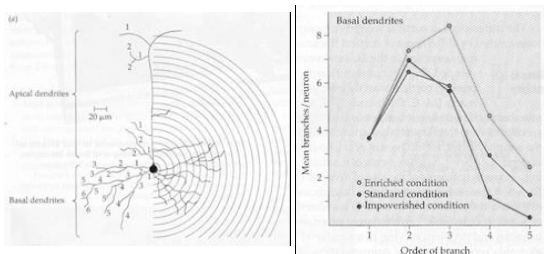
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## Environment Affects Biology



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## Implications of Neuroscience for Psychopathology

- Relations Between Brain and Abnormal Behavior
  - Example: Obsessive compulsive disorder (OCD)
    - Orbitofrontal and cingulate circuits
    - Serotonin system affected
    - poor inhibition of thought, affect, and behavior

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## Implications of Neuroscience for Psychopathology

- Experience Can Change Brain Structure and Function
  - Environmental effects might lead to the development of pathology
  - Medications and psychotherapy both shown to effect functional brain activity (Baxter et al., 1992)

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## Psychological Contributions to Psychopathology

- Conditioning and Cognitive Processes
  - Classical and operant conditioning (Pavlov; Watson; Skinner)
  - Learned helplessness (Seligman)
  - Modeling and observational learning (Bandura)
  - Prepared learning - adaptive (Mineka)
- Cognitive-Behavioral Models (Beck; Ellis)
  - Evidence that thought can influence mood and behavior

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## The Role of Emotion in Psychopathology

- Components of Emotion
  - Behavior (trembling, yelling)
  - physiology (BP)
  - cognition (expectancies)
- Harmful Side of Emotional Dysregulation
  - Anger, hostility, emotional suppression, illness, and psychopathology



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## Social-Psychological Factors in Psychopathology

- Cultural Factors

- Influence the form and expression of normal and abnormal behavior



- Gender Effects

- Exerts a strong effect on psychopathology
- Gender roles affect expression of normal and abnormal behavior



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## Social-Psychological Factors in Psychopathology

- Social Relationships

- Frequency and quality related to mortality, disease, and psychopathology
- Interpersonal Psychotherapy



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## The Multidimensional Perspective

- Multiple Causation
  - Is the rule, not the exception
- Take a Broad, Comprehensive, Systemic Perspective
  - Addressing biological, psychological, social, cultural, and developmental factors
- Useful in Understanding the Causes of Psychopathology and its Alleviation

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