Biopsychosocial Approach to Psychopathology

http://courses.ucsd.edu/frose/ps163

“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
Multidimensional Model of Abnormal Behavior

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

Multidimensional Approach

- Posttraumatic Stress Disorder (PTSD)
  - Biological:
    - Familial history of depression and anxiety suggests genetics
    - Extreme autonomic (sympathetic) arousal
    - Hippocampal hypotrophy
  - 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
Genetic Contributions to Psychopathology

- Phenotype vs. Genotype
- Behavior is typically polygenetic
  - GTF2i and sociability
- Genes aren’t everything

Genetic Contributions

- Reaction Range: Degree of potential outcome determined by heredity; actual outcome is determined by environment
The Interaction of Genetic and Environmental Effects

- The Diathesis-Stress Model
  - “Diathesis” = susceptibility to develop a disorder
  - Examples: Blood-injury-injection phobia, alcoholism, animal aggression
  - Oversimplified

The Interaction of Genetic and Environmental Effects

- Reciprocal Gene-Environment Model
  - Scarr, 1993
  - Examples: Depression, impulsivity
- Non-Genomic Inheritance of Behavior
  - Biology is not destiny
Gene-Environment Interaction

- Suomi and colleagues
  - Serotonin Transporter Gene (5-HTT)
    - Long allele - normal variant
    - Short allele - less typical variant
  - Hypothesis: genotype will alter social behavior
  - Population: Rhesus Macaques

Gene-Environment Interaction

Parenting Experience
Gene-Environment Interaction

- Conclusions from Suomi et al.
  - The effects of 5-HTT allele variation depends upon environmental stressors
  - Not known if same affect would be seen in humans

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
Gene-Environment Interaction

- Conclusions
  - The nature/nurture debate oversimplified
  - Growing evidence that genes and the environment *interact*
  - Mental health professionals must take a biopsychosocial perspective
Neuroscience Contributions to Psychopathology

(from Goldstein, 1994)
Structure of a Neuron
• Dendrite
• Soma
• Nucleus
• Axon
• Myelin Sheath
• Terminal Button

Neuroscience and the Divisions of the Brain

- Hindbrain
  - Medulla
  - Pons
  - Cerebellum
- Midbrain
  - Coordinates movement with sensory input
  - Contains parts of the reticular activating system
- Forebrain (Cerebral Cortex)
  - Most sensory, emotional, and cognitive processing
  - Two specialized hemispheres (left and right) joined by the corpus callosum
Neuroscience and Brain Structure

- Lobes of Cerebral Cortex
  - Frontal –
  - Parietal –
  - Occipital –
  - Temporal –

Neuroscience and the Divisions of the Brain (cont.)

Major structures of the brain
Neuroscience and Brain Structure

- Limbic System
  - Thalamus – “Executive Assistant”
  - Hypothalamus – “The 5 Fs”
  - Amygdala – “Emotion center”
  - Hippocampus – “Memory-maker”

The limbic system
Major Neurotransmitters in Psychopathology

- Functions of Neurotransmitters
  - Agonists -
  - Antagonist -

Major Neurotransmitters in Psychopathology

- Main Types of Neurotransmitters
  - Serotonin (5HT) – “All’s well.”
  - Gamma aminobutyric acid (GABA) – “Calm down.”
  - Norepinephrine – “Get excited!”
  - Dopamine – “Great job! Keep going!”
Neuroscience: Functions of Main Types of Neurotransmitters (cont.)

Manipulating serotonin in the brain

Environment Affects Biology
Environment Affects Biology

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
Implications of Neuroscience for Psychopathology

- Experience Can Change Brain Structure and Function
  - Diathesis-Stress
  - Medications and psychotherapy both shown to effect functional brain activity (Baxter et al., 1992)

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
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

Social-Psychological Factors in Psychopathology

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