Biopsychosocial Approach to Psychopathology

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

“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
• Development and behavior is typically polygenetic
  – GTF2i and sociability
• Genetic Contribution to Psychopathology Less than 50%

Genetic Contributions

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

• 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

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
Gene-Environment Interaction

Conclusions from Suomi et al.
- The effects of 5-HTT allele variation depends upon environmental stressors
- Short allele homozygocity 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

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 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

Neuroscience Contributions to Psychopathology
Structure of a Neuron
- Dendrite
- Soma
- Nucleus
- Axon
- Myelin Sheath
- Terminal Button

Neuroscience and the Divisions of the Brain
- Hindbrain
  - Medulla – Heart rate, blood pressure, respiration
  - Pons – Regulates sleep stages
  - Cerebellum – Involved in physical coordination
- Midbrain
  - Coordinates movement with sensory input
  - Contains parts of the reticular activating system (RAS)
- 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 – Thinking and reasoning abilities, memory
  – Parietal – Touch recognition
  – Occipital – Integrates visual input
  – Temporal – Recognition of sights and sounds, long-term memory storage

Neuroscience and the Divisions of the Brain (cont.)

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
The limbic system

Major Neurotransmitters in Psychopathology

- Functions of Neurotransmitters
  - Agonists, antagonists, and inverse agonists
  - Most drugs are either agonistic 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

Neuroscience: Functions of Main Types of Neurotransmitters (cont.)
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
  - Environmental effects might lead to the development of pathology
  - 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

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
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