CL 732
Disorders of Adulthood II: The Relevance of Neuroscience to Clinical Practice

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Goals

Class 1. To familiarize students with the emerging knowledge in the neurosciences;
Class 2. To discuss the relevance of this body of knowledge to the development of psychopathology; and
Class 3. To delineate the major controversies this new paradigm raises.

Objectives

Class 1. To examine the problems inherent in attempting to integrate two disparate disciplines;
Class 2. To reconceptualized the nature and dynamics of some types of psychopathology;
Class 3. To discuss the implications for treatment interventions

Required Texts


I suggest you purchase one book marked with an asterisk (*) as a basic text on brain function and one marked with two asterisks (**) as a basic text on clinical relevance.


*Bloom, F. E., Beal, M. F., & Kupfer, D. J. (Eds.). (2003). The
Dana guide to brain health. New York: The DANA Press. [Excellent guide, highly recommended]


**Course Outline**

**Class 1. Introduction: The relevance of neuroscience to clinical practice**

A. Freud Revisited

1. Revival of Freud’s Project

2. Can psychoanalysis and neuroscience be integrated?
3. The relevance of neuroscience to clinical practice
4. The agenda for a new paradigm

B. The paradigm: Neurodevelopmental perspective

1. Philosophical underpinning: Post-positivism
2. Viewpoints: Multiple descriptive, interpersonal, and empathic
3. Root metaphor: Organismic evolutionary perspective
4. Metapsychology:
   a. Development: Neurodevelopmental perspective
      (1) Impact of neuropsychological strengths and weakness on development
      (2) The effects of relationships on development
      (3) The intrapersonal integration of experience
   b. Personality: results from interaction between nature and nurture
   c. Psychopathology: innate factors contribute to dysfunctional states
   d. Cure: brain changes result from talk therapy


C. Kandel's contribution to the integration dialogue:

- a. The nature of the dynamic unconscious
- b. The problem of psychic determinism
- c. The role of development in psychopathology
- d. The causes of psychopathology
- e. Does psychotherapy produce brain change?
- f. Psychopharmacology and psychopathology


D. Evolutionary perspective


Class 2. Development -- Of brains and selves: The making of minds [From neuropsychology to self psychology]

A. Brain organization and function

1. Outline

   a. The Brain and its functions

      (1) Brain functions
      (2) Brain development
      (3) Brain anatomy
      (4) The neuron
      (5) The neurotransmitters
      (6) Neuronal networks

   b. The sense of self: The self as the person

      (1) The sense of self cohesion
(a) The context
(b) Social communication
(c) Mindsharing
(d) Theory of mind
(e) Emotional communication

(2) Coherent self-narratives

(a) Personal and shared meanings
(b) Central coherence
(c) Relevance theory

c. Neurobiological underpinnings of the sense of self

2. Brain function


a. The brain is not a single system. It is many interacting and interconnected systems organized in a specific hierarchy with the most complex (cortex) and the least complex (brainstem) on the bottom.

b. Different parts of the brain different systems in the brain mediate different functions (e.g., the cortex mediates thinking, the brainstem/midbrain mediate state of arousal).

c. All systems in the brain are composed of networks of nerve cells (neurons). These neurons are continuously changing (in chemical and structural ways) in response to signals from other parts of the brain, the body, or the environment (e.g., light, sound, taste, smell).

d. The changes in neurons allow the storage of information. This storage of information is the basis of memory (memory of all types motor, sensory, cognitive, and effective.)

e. Different parts of the brain -- which mediate
different functions -- store information (memory) that is specific to the function of that part of the brain. This allows for different types of memory -- for example, cognitive (names, phone numbers), motor (typing, riding a bicycle), affect (nostalgia).

f. The brain stores information in a use-dependent fashion. The more a neurobiological system is activated, the more advanced that state (and functions associated with that state) will be built-in, for example practicing the piano, memorizing a poem, or staying in a state of fear.

g. In different states of arousal (e.g., calm, fear, sleep), different neural systems are activated. Because the brain stores information in a use-dependent fashion, the information stored (i.e., the memories) in any given situation depends upon the state of arousal (i.e., the neural systems that are activated). One example of this is state-dependent learning, another is the hyperarousal system seen in PTSD.

3. Brain development

a. The brain develops in a predictable fashion, from most primitive to most complex. Ontogeny recapitulates phylogeny.

b. Normal development of neuronal systems (and functions they mediate) requires specific patterns of activity-specific signals at specific times during development.

c. These critical periods are windows of vulnerability during which the organizing systems are most sensitive to environmental input including traumatic experience.

d. Because the different systems in the brain develop (or mature) at different times in the life of the child, there are different critical periods for different functions (e.g., regulation of anxiety, mood, abstract thought).

e. Because these brain systems developing in a sequential fashion, from brainstem to cortex, optimal development of more complex systems (e.g., the cortex) requires healthy development of less complex
systems (e.g., the brainstem and midbrain).

f. Therefore, if the state-regulating parts of the brain (brainstem and midbrain) develop in a less than optimal fashion (e.g., following excessive traumatic experience) this will impact development of all other regions in the brain.

g. The brain remains sensitive (plastic) to experience throughout life, but different parts of the brain are more plastic (cortex) and others are relatively implastic (brainstem).

h. Experience can change the mature brain, but experience during the critical periods of early childhood organizes brain systems!

i. Trauma and during infancy and childhood, then, has the potential effect of influencing the permanent organization and all future functional capabilities of the child.


5. Neurons

6. Neurotransmitters


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<tr>
<th></th>
<th>Psychodynamic</th>
<th>Behavioral</th>
<th>Biological</th>
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<tr>
<td><strong>Emphasis</strong></td>
<td>Mind</td>
<td>Behavior</td>
<td>Brain</td>
</tr>
<tr>
<td><strong>Causes of Illness</strong></td>
<td>Disturbed dynamics; Childhood experiences</td>
<td>Learned habits</td>
<td>Biological imbalances</td>
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<td><strong>Methods of Study</strong></td>
<td>Introspection (Free association, dream analysis)</td>
<td>Controlled experiments (Use of conditioning, animal research)</td>
<td>Neurosciences (Neurochemistry, behavioral genetics)</td>
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<td><strong>Types of Illness</strong></td>
<td>Mild (Neuroses, personality disorders)</td>
<td>Mild to severe (Neuroses, personality disorders, addictions)</td>
<td>Moderate to severe (Depression, mania, schizophrenia)</td>
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<td><strong>Method of Treatment</strong></td>
<td>Psychotherapy</td>
<td>Behavior modification</td>
<td>Medication</td>
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B. The sense of self
1. The neurobiological underpinning of the sense of self: Endowment, innate factors, genetic, constitutional factors....

2. Relational Component: The neurobiological underpinnings of object relationships.
   a. The self as the person
   b. The sense of self-cohesion
   c. The context
   d. Social communication
   e. Mindsharing
   f. Theory of mind

3. Emotional communication
   a. The Universal Language of Emotions
      (1) Reception of emotional communications
      (2) The Expression of Emotions
      (3) Dispositional states
   b. The Contributions of Affective Neuroscience
      (1) Davidson's contribution
      (2) Greenspan

4. Coherent self-narratives
   a. Personal and shared meanings
   b. Central coherence
   c. The self-narrative
      (1) The self-narrative is constituted of memories of life events that are stored in both implicit (procedural, associative) and explicit (semantic, episodic) memories.
      (2) The communications through which children tell us about themselves reveal their self-narrative. These include autobiographical statements, fantasies, play sequences, and nonverbal enactments of their desires, beliefs and
feelings.
(3) Developmentally, the self-narrative is formed from the scripts that emerge shortly after birth. Scripts encode both the event and the associated affects. These scripts are encoded as implicit memories. Some become organizing themes or motifs within the self-narrative. By age five, a child is capable of making explicit autobiographical statements.

d. Narrative coherence

(1) Human beings are motivated to make sense of their experiences. They attempt to do so by creating a coherent self-narrative that organizes the meanings of experiences stored in implicit and explicit memory.
(2) A set of positive affects is associated with having a coherent self-narrative
(3) For children with neuropsychological deficits, the integration of the shared meanings of experiences may enhance their ability to attain a coherent self-narrative. This coherence is contingent upon the concordance of the self-narrative with the context in which they are raised and the community's beliefs and values.


(4) Central Coherence

(a) Frith (1989a; 1989b) proposed the construct of acentral coherence to explain some puzzling aspects of the behaviors of children with autism. She noted that although they appear to be capable of doing well on tasks such as block design, they are incapable of noticing the broader gestalt of a social context. Their visual
perceptual capacities are sufficiently intact to permit them to successfully perform the former task but not in the latter ones. She defined central coherence as related to the drive to integrate information into context, gestalt, and meaning. In order to explain the phenomenon in children with autism, she differentiated between local coherence and global coherence. Children with autism have the capacity for local coherence but not global coherence. They are therefore said to have weak central coherence.

(b) This construct has relevance for us on two scores: (1) its relationship to the concept of narrative coherence, and (2) its applicability to the self-narratives of children with NLDs. The capacity for central coherence is a necessary condition for the creation of a coherent self-narrative. Without that capacity, children can only give a disjointed and fragmented account of their history, as is the case of the histories given by children with Asperger's Disorder and autism. It should be kept in mind that narrative coherence is not an absolute requirement for mental health. If that were the case, most of us would fail that criterion. There is a difference between having gaps in one's self-narrative and having an incoherent self-narrative or no capacity whatsoever to generate a self-narrative. The latter is the case for children with autism.
(c) Children with NLDs have the capacity to generate a self-narrative, but not necessarily one that is entirely coherent. The question then is whether their failure is related to an impairment in central coherence or whether they have intact central coherence but cannot generate a coherent self-narrative for other reasons. I would lean in the direction of the position that they do possess central coherence but have gaps in the information they acquired, and fail to integrate the nature of their disability. In other words, their impairment in the acquisition of nonlinguistic perceptual information or nonverbal information would lead to the incomplete encoding of the elements of the situations to which they are exposed. Their retrieval, when they are required to relate an experience, reflects accurately what was stored. The fact that their account may not make sense to a listener is due to the incompleteness in the original perception rather than to an inability on their part to make sense of what occurred. Confirmation of this position is found clinically when I ask a caregiver to join a child during our sessions. When told by the child, the particular incident the child narrates is unintelligible; the account seems fragmented and disjointed. In the presence of the caregiver, who fills in the gaps, not only can I understand fully what occurred, but the child is able
to confirm that understanding.

5. Relevance Theory

6. Neurobiological underpinnings of the sense of self

Class 3. Psychopathology: Disorders of the self -- Deficits and disconnections [Self-cohesion and fragmentation]

A. Outline

1. Two views of psychopathology
2. Neuropsychological deficits
   a. Learning disorders
   b. Behavioral disorders
3. Social-emotional disorders
   a. Attachment disorders: The memory system
      (1) Secure attachments
      (2) Insecure avoidant attachments
      (3) Insecure ambivalent attachments
      (4) Disorganized/disoriented attachments
   b. Social-emotional learning disabilities
      (1) Asperger's Disorder
      (2) Autism

B. The diagnosis of pathology: conflict or deficit.

1. Etiology or genetic dynamic factors: Two competing view of pathology have now emerged: One states that pathology derives from unresolved conflict, and the other states that it stems from developmental failures.
   a. Conflict models
   b. Deficit models
      (1) Unstable self-cohesion
         (a) Psychopathology is the result of deficits, distortion or weaknesses in the sense of self (p.53). The evidence is that the self is multi-fragmented, disharmonious, depleted, devitalized, or enfeebled
(p.60).
(b) Single traumatic events rarely play such a decisive role in pathology as to produce the types of deficits encountered in narcissistic personality disturbances. It is rather the chronic multiple failures of the selfobjects that lead to such deficits.
(c) The meaning of the experience is the paramount factor in the effect an event has on the person.
(d) The affects surrounding that experience remain unintegrated, and become the focus around which symptoms are manifest.
(e) Symptoms: Symptoms are the expression of the concretization of the experience of danger related to the anxiety surrounding the loss of meaning.

(2) The loss of self-cohesion

(a) It is a condition in which the child is unable to maintain a sense of inner organization and self-continuity.
(b) It is characterized by anxiety, defenses against anxiety, and a variety of symptoms.
(c) It occurs when complementary functions are unavailable to a child with a learning disorder, when the child is unable to utilize those functions even when available, or when the child cannot compensate for his deficits.

(3) The emergence of a disorder of the self

(a) A disorder of the self emerges when negative self-
evaluations result in loss of self-esteem.
(b) A disorder of the self emerges when complementary functions such as:

i) Selfobject functions are unavailable or if available the child's learning disorder interferes with their utilization.
ii) Adjunctive functions are insufficient to help the child
iii) maintain self-cohesion or the child is unable to use them.
iv) attain the intended goal in a task or the child is unable to use these functions.

2. Compensations and protective factors: Compensations may be available to prevent the child from a loss of self-cohesion.

C. Neuropsychological deficits

1. Neurobehavioral disorders include learning disorders, learning disabilities, and a wide range of brain-based disorders, such as autism, mental retardation, Tourette's Syndrome, genetic disorders, and disorders that result from head injuries or infections of the brain.
2. Learning disorders include learning disabilities such as language-based learning disabilities, AD/HD, executive function disorders, nonverbal learning disabilities, Asperger's Disorder, and motor problems that involve problems of large and small muscle coordination. Excluded are autism, mental retardation, Tourette's Syndrome, genetic disorders, and disorders that result from head injuries or infections of the brain.
3. Learning disabilities include language-based learning disabilities: problems in language reception, such as dyslexia and central auditory processing problems; expressive language problems, such as problems in verbal or written expression.
D. Social-emotional disorders

1. Attachment: Allan Schore


a. Schore presents a psychoneurobiological point of view that specifies the structural systems of the developing unconscious in terms of recent brain research. His work attempts to delineate the origins of the self by attempting to document the ontogenetic evolution of the neurobiology of subjectivity and intersubjectivity, which he equates with the experience-dependent self-organization of the early developing the right hemisphere. The structural development of the right hemisphere mediates the functional development of the unconscious [nonconscious/nonverbal] mind. It is the repository of the unconscious internal working models of the attachment relationships. Due to the central role in unconscious function of the right hemisphere, he offered data to show that it contains an affective-configurational representational system, one that encodes self-and-object images, while the left hemisphere utilizes a lexical-semantic mode. Psychic structure refers to those specific brain systems, particularly right brain systems, that underlie the various mental functions. According to Schore, Bowlby attempted to address the question of how and why certain early ontogenetic events have such an inordinate effect on everything that follows. He centered his answer in a context in which the mother and her infant experience connections and these connections are vital to emotional communications. Therefore, attachment transactions mediate the social construction of the human brain, specifically the social emotional brain that supports the unique operations of "the right mind." Finally, Schore argues that attachment theory is fundamentally a regulatory theory. He discusses some of the psychobiological regulatory events that mediate the attachment process, and the psychoneurobiological regulatory
mechanisms which the "right mind" organizes infancy. He concluded that the self-system is located in the early maturing right brain, that psychological functions are the product of the brain structures that undergird them, and that regulation is a central organizing principle of human development and motivation.

b. Attachment redefined: According the Schore, recent contributions from neuroscience offered support to Bowlby's assertion that attachment is instinctive behavior with a biological function. He extended Bowlby's theoretical formulation by stressing that central to attachment theory is not only the infant's search for a secure base but also the affectional bond that exists between infant and caregiver. Schore emphasized that this affectional bond forms the cornerstone of the emotional communication between the dyad. Emotional processes lie at the foundation of the instinctive behavior. Schore replaced Bowlby's biological control systems with the brain systems that regulate the affectively driven instinctive behavior. These systems are found in the brain's orbitofrontal region and its subcortical connections. They constitute a "senior executive of the emotional brain" that acts as a regulatory system. For Schore, attachment theory is a regulatory theory. Attachment occurs as a result of the emotional interchanges between the infant and its caregiver and the attachment process mediates the social construction of the social brain. Schore's theoretical program became that of elucidating the neurobiological underpinnings of the emotional interchanges between infant and caregiver and of the processing and regulation of emotional information by the infant's brain. To that end, Schore explored the functions of the right hemisphere, the frontal and prefrontal cortex and the subcortical systems associated with these processes.

c. The neurobiology of secure attachments

d. The neurobiology of insecure attachments

2. Social-emotional learning disabilities

a. Asperger's Disorder
b. Autism

Class 4. Good stories and bad stories [Narrative coherence and incoherence]

A. Intrapersonal component: The Neurobiology of disorders of the self
1. Outline

   a. Incoherent self-narratives
      
      (1) Trauma
      (2) PTSD
      (3) Bereavement

   b. Personality disorders and belief systems
      
      (1) Narcissistic personality disorders
      (2) Other personality disorders

2. Incoherent self-narratives

   a. Incoherences in the self-narrative represent the child's failure to make sense of episodes within her experiences
   b. These incoherences are accompanied by feelings of confusion, uncertainty, and lack of comprehension.
   c. They are produced when the child's self-narrative is not concordant with the community's beliefs and values.
   d. The emergence of a disorder of the self

   (1) A disorder of the self emerges when:
      
      (a) A discordance exists between the personal meanings the child has construed from her experiences and the shared meaning those experiences have for others.
      (b) A conflict between two or more motifs in the self-narrative develops, such as those that result from emplotments or conventionalizations.
      (c) The child's neuropsychological deficits interfere with the ability to integrate the meanings of a set of experiences within the broader self-narrative.

   (2) Disruptions in narrative coherence come in a range from partial to substantial
incoherences.


e. Mindsharing


f. PTSD


(1) The response to trauma

(a) The brain mediates threat with a set of predictable neurobiological, neuroendocrine, and neuropsychological responses.
(b) These responses may include different survival strategies ranging from fighting or fleeing to giving up or a surrender reaction.
(c) There are multiple sets of neurobiological and mental responses to stress. These vary with the nature, intensity and frequency of the event. Different individuals may have different response- sets of the same trauma.
(d) Two primary adaptive response patterns in the face of extreme threat are the hyperarousal continuum
(defense, fight or flight) and the dissociation continuum (freeze and surrender response). Each of these response sets activates a unique combination of neural systems.

(e) These response patterns are somewhat different in infants, children and adults, though they share many similarities. Adult males are more likely to use hyperarousal (fight or flight) response; young children are more likely to use a dissociative pattern (freeze and surrender) response.

(f) As with all experience, when the brain activates the neuropsychological systems associated with alarm or with dissociation, there will be use-dependent neurobiological changes (or in young children, use dependent organization) which reflect this activation.

(g) These use-dependent changes in the brain development and organization underlie the observed emotional, behavioral, cognitive, social, and physiological alterations following childhood trauma.

(h) In general, the predominant adaptive style of an individual in the acute traumatic situation will determine which posttraumatic symptoms will develop hyperarousal or a dissociative.

(2) Clinical work with mouse treated infants

(a) Anything that can decrease
the intensity and duration of the acute response (alarm or dissociative) will decrease the probability of persisting neuropsychiatric symptoms. (b) In general, structure, predictability, and nurturance are key elements to a successful early intervention with a traumatized infant. (c) The primary source of these key elements is the primary caretaker. Therefore, it is critical to help the caretakers understand as much as about post-dramatic responses as possible. (d) If the primary caretakers were impacted by the same trauma, it is imperative that they get treatment which complements the work of the child. (e) Early assessment and intervention can be prophylactic, helping prevent a prolonged acute neurophysiological, neuroendocrine, and neuropsychological trauma response.

Bereavement

B. Personality disorders and belief systems

1. Narcissistic personality disorders
2. Other personality disorders
3. Intrapersonal component: The Neurobiology of consciousness

Class 5. Depression and depletion [The empty self]

A. Depression and the neurotransmitter system
B. Demoralization
C. Depletion

Class 6. Anxiety and self-esteem [Mirror Transferences]

A. Anxiety disorders, phobias, and the amygdala


B. Empathy, self-esteem, and the mirror neurons system


Class 7. Self-regulation and dysregulation [Idealizing transference]

ADHD, Executive Function Disorder, and the frontal lobe

Class 8. Interconnectedness and dehumanization: [Twinship transferences]

Social learning disabilities: Nonverbal learning disabilities, Asperger's Disorder, and autism
