Neurobiological Correlates of Object Relations Theory[2]

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Learning Objectives

1. Relate Freudian drive theory to affect systems.

2. Differentiate prefrontal areas related to self and object differentiation.

3. Contrast phases of conscious and unconscious development memory.

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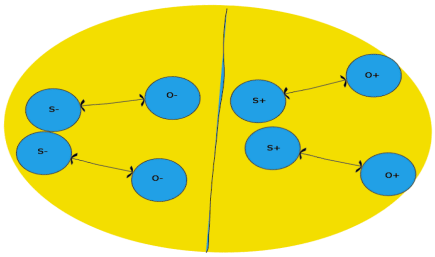
PSYCHOANALYTIC OBJECT RELATIONS THEORY:

- Internalization of significant relation between self and others as building blocks of the mind: Dyadic units and the "tripartite structure"
- Intrapsychic organization of basic dyadic units as fundamental structures of the personality: Fairbairn – Melanie Klein – Bowlby
- These basic object relational dyads are embedded in peak affective states – both positive and negative

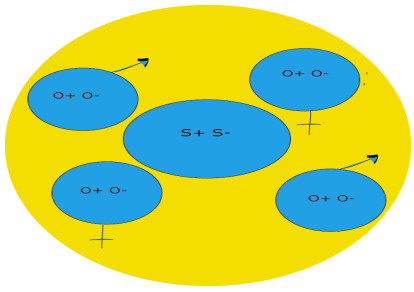
Normal Identity and Identity Diffusion

The Basic Units

Split Organization:
Consciousness of all-good or all-bad



Normal Organization:
Consciousness of Integration/complexity



Neurobiological Foundation for Object Relations Theory:

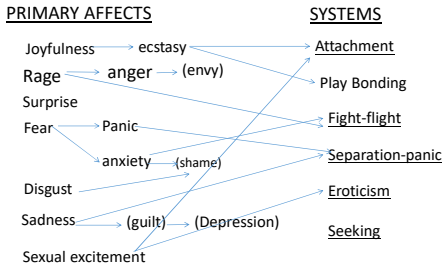
- **Affective systems activation**

- **Differentiation of self and other**
- **Empathy and Theory of mind**
- **Self structure**
- **Mentalization**
- **The Dynamic Unconscious**
- **Unconscious phantary and the development of the superego**

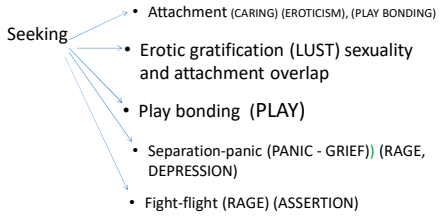
Personality Organization

- Temperament: Affects, Cognitive Organization - (Effortful control and Behavior
- Affect systems (Panksepp) — Attachment, Eroticism, Fight flight, Play bonding, Separation-panic, Seeking
- Character ⟷ Identity
- Value systems ("Super Ego") → Morality and Spirituality
- Intelligence

- Basic question: What is it? Where is it? (Cognition) Important or not?
  Is it good or bad for me? What shall I do about it? (Affect)



AFFECTIVE SYSTEMS INTEGRATION AND DEVELOPMENT



Brain Structures Controlling Affects:

Hypothalamus:	Homeostatic bodily systems:	Temperature
	+ and (-) affect activation:	Hunger, thirst
		Fight-flight
		Sexual excitement

Positive affects: nucleus accumbens, tectum
Negative affects: amygdala, (lateral: fear, central: rage)
Sexual stimulation: ventral septal area, ventral area of stria terminalis, pre-optic area of hypothalamus

Positive and negative affect activating brain structures are separate from each other

Contextualization of affect: prefrontal and preorbital cortex - anterior cingulum Vm pfc/acu

Co-determined by:

- Presently determined affective activation
- Declarative or semantic memory input by sensorial- thalamic information
- Affective memory input: hypothalamic input and hippocampus affective memory storage

It is only at this level that positive and negative affect systems can be integrated

The origin of the self: self reflection and integration

1) Fundamental brain structures involved
   - Left and right temporo-parietal junction: particularly right TPJ
   - Superior temporal sulcus
   - Medial prefrontal cortex
   - Para cingulate cortex

2) Broader network involved:
   - Bilateral Temporal Cortex
   - Precuneus
   - Amygdala

2) Perception of Others

   - Dorsolateral prefrontal cortex
   - Posterior parietal cortex
   - Temporo-occipital cortex

The Embodied Self

A) Background information:

- Ownership of own body (thalamus-cortical system, and affective internal state: hypothalamic and midbrain: amygdala, nucleus accumbens, PAG tegmentum
- Location of self in space (superior and inferior colliculi)
- Authorship and control of own actions: mirror system
- TOM: differences between own fantasy (wishes + fears) and reality (others' views)

B) Actual consciousness

- Perception of environment and identification of social reality
- Cognitive function: thinking, imagining, remembering now
- Affective system: motivation

"Gerhard Roth: the self is a momentary flickering on"

- Only the prefrontal cortex – anterior cingulate system can integrate the self experience: not the hypothalamus, amygdala nor hippocampus: positive and negative affective system run separately
- The self: Protoself: bodily homeostasis
  Core self: conscious and placement in space and time

Stable self-concept:
- autobiographical memory
- anticipation
- linguistic self
- mental
- social self

VMPFC/ACC

Early Development of Self and Other:

1st day crying response

First 6 to 8 weeks:
- **Different reactions to animate faces and inanimate patterns**
- **Differentiate mother's voice**
- **Smiling response to "not me"**
- **Multi-modal transfer**
- **Follows movement and size of visual stimuli**

2 months: pulling music box
Implication: Early cognitive differentiation between Self and Other

Development of understanding of self and others

6 months: further discrimination of facial expression as emotion

6 months to 2 years: action as indicating desire

12 to 14 months: gaze perception as indicating interest

12 to 18 months: Attribution of mental states to others, "equivalency"

- Throughout these functions: early attribution of mental states to others, over shadowed by attribution of same emotion under peak affect states
- Attribution of beliefs: completed by 3rd to 4th year
- False belief system: Mary and Jane

- Gallese's Mirror systems: actions, perceptions, and emotions of others are replicated internally at neuronal level and determine social cognition
- Actual interactions foster social cognition
- Role of emotional recognition reinforced by language
- 18 month to 3 years: Verbal self: "I" and "you"
- 24 to 36 months: "negativism" good and bad images of mother become integrated : "object constancy"
  Integration of positive and negative affective relations
- 3 to 5 years: "private self"

TOM evolves early by multiple systems

Empathy and Compassion

- Feeling what the other is feeling
- Knowing what the other is feeling
- Intend to mitigate the others feeling

Empathy for pain in another:

- Anterior portion of insula
- Anterior cingulate cortex
- Lateral prefrontal cortex
- Cerebellum

Empathy: differentiate from theory of mind

1) Contagions: from first few weeks, mechanism unknown, may not involve mirror systems at all: ancient phylogenetic subcortical system

2) Gating: affective focusing related to attachment, play bonding, erotic system

3) Mirror systems: first cortical (premotor), but then widely distributed (insula, parietal + temporal cortex) "cognitive – emotional recognition system

Empirical Evidence for Empathy

12 to 14 months:
1) "Helper"
2) Affected- but non helpers (concerned!)
3) "Confused" but resounding
4) Indifferent: (Related to non self-recognition in mirror)

- Empathy originates in affective processes and becomes enriched with cognitive development

Affective Processes	Cognitive Processes
Brain stem regions	Paralimbic region
PAG • amygdala • stratum	Cingulate • insula •
Septal region • hypothalamus	Orbito-frontal region
Autonomic nervous system	

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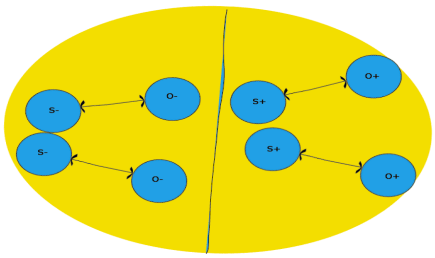

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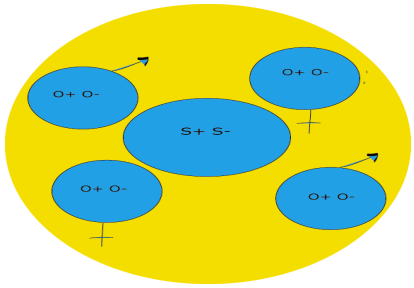

Borderline Personality Organization:

- Identity Diffusion
- Primitive Defensive Operations
- Reality Testing

Neurobiology and Object Relations Theory

- The dyadic units reflect the availability of differentiation of self from other from the first few months of life on, and their intimate relation under the effect of peak affect states
- The integration of self and of total object representations depends on the predominance of positive relationships, and is threatened by the predominance of negative ones

- Primitive mental mechanism of splitting and their derivatives are based on biological developments of separate positive and negative affective systems, and their potential integration at a cortical level of processing
- Intrapsychic structures reflect a second level of organization, based upon a primary neurobiological one

Mentalization

- Origin: "it is I who feels"
- Interpreting behavior of self and others in terms of intentional mental states, (beliefs, desires, fears) and ability to reflect on experienced mental states
- Gradual development as consequence of cognitive development of self – other differentiation, cognitive contextualization of affective states, theory of mind, empathy, and integration of the self
- Two phases:
  1) understanding present affect state in terms of an immediate object relationship
  2) Relating it to the background self-experience, and background experience of others within the present social context
- Mentalization as a specific function disturbed under conditions of identity diffusion: lack of integrated self and object representations

Mentalization Cont'd:

- Predominance of "persecutory" over "idealized" segment of experience predisposing to negative distorted interpretation of present interpersonal interactions
- Reinforcement by primitive defensive operations: splitting, projective identification, denial, omnipotent control, devaluation
- Vicious cycles of pathological interactions

Borderline Personality Disorder

1. Neurobiological Features

- Genetic predisposition – substantive familiar aggregation
  - Serotonin transporter gene function reduced
- Deficit of the attentional control network
  - Hypoactivity in prefrontal regions: abnormalities in the ACC, VMPFC, midbrain and ventral striatum
  - Decreased function of cortical and subcortical midline brain structure
- Reflexive" rather than "reflective" reactivity to emotional, particularly negative stimuli
- Hyperactivity of the amygdala (negative affectivity augmented)

2. Severe Childhood Trauma

- Severe childhood trauma and sexual abuse
- Unfavorable problematic parenting
- Hostile object relations
- Insecure attachment relations
- Limited symbolization-reflectiveness capacity

3. Prevalent Character Pathology

- Negative affectivity
- Impulsivity
- Emotional dysregulation. Contagion dominates empathy.
- High rejection sensitivity
- Disturbed object relations
- Chaotic self evaluation

How do these features relate to each other?

- Genetic disposition to heightened temperamental negative affect reactivity
- Decreased processes of self regulation related to low executive attention and effortful control derived from combination of constitutional lowered prefrontal and preorbital control centers, negative affective dominance and failure of positive social reinforcement of effortful control and reduction of negative reactivity
- Heightened rejection sensitivity derived from dominance of negative affective interactions, and "reflexive" stimuli processing under conditions of inadequate "reflective" function (mentalization)
  - Consequences:
    - Impulsivity
    - Aggression
    - Affective dysregulation
    - Abnormal interpersonal pattern
    - Chaotic self experience

What does object relations theory contribute to Understanding and treatment of BPD?

1) Predominance of negative, persecutory segments precludes integration of normal identity
2) All affects-peak affect states – involve a relationship between self and other
3) Negative affect activation activates a negative (s)– (o) relationship
4) The original "equivalence" relation evolves into a complementary "persecutor" – "victim" relation that is reactivated under negative stimulation
5) Consistent efforts to reverse the persecutory relationship (becoming the victimizer) and to maintain idealized positive relations increase chaos

5. Primitive defenses prevent resolution of the split structure

- Splitting ⟶ Segmentation of positive and negative experiences of self and other
- Projective identification ⟶ Attribution of aggression to the other
- Omnipotent control ⟶ coercion and conflict with the other
- Denial ⟶ lack of integration of positive and negative experiences
- Devaluation ⟶ destruction of potential good relations
- Lack of affective integration maintains primitivity of negative affects and fosters impulsivity

TFP: Transference Focused Psychotherapy

General Assumption: Predominance aggressive, persecutory segment of experience, whatever its origin, prevents identity integration. Identity integration will integrate concepts of self increasing cognitive control; integrate concept of other, normalizing social life, and integration of affects: affect modulation

Strategy: Clarify the object relation activated in the treatment situation (transference) at each affective dominant time: both positive and negative experiences

- Mentalization and interpretation under conditions of splitting
- Point to role reversals first, and dissociated, opposite positive and negative affective relations in the transference later

- Technical neutrality, protection of the therapeutic frame, and "three person psychology"
- The interpretation of primitive defenses, and of metaphorical primitive object relations
- The focus on work and profession, love and sex, social life and creativity
- Transference – countertransference interpretation under 3 sets of circumstances:
  - Repressed unconscious conflicts
  - Dissociated unconscious conflicts
  - Enacted but not mentalized unconscious conflicts (the earliest, "reverie" receptive ones)

Thank you.
Questions?