Self-attachment: an integrative and holistic psychotherapeutic technique

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Initial Motivation

• Mongol Trauma hypothesis (A.E. 2010):
• Islamic-Iranian holocaust
• Transgeneration of Mongol trauma
• Major source of root cause of psychological disorders
• Ideological root of Al-Qaeda and ISIL (Daesh)

Great Challenge:

Need an effective self-help therapeutic method

Big Question:
Can we synthesize the Eastern rehabilitation methods with modern psychological sciences?
Disorders of affect regulation

- “The overwhelming majority of psychiatric disorders are disorders of affect regulation in social interactions.” (Schore 2003, 2013; Cozolino 2006, 2010).

- An *incapacity to regulate strong emotions* underpins depressive and anxiety disorders, bipolar disorders, borderline personality disorder, schizophrenia and all types of personality disorders.
Attachment theory (Bowlby, Ainsworth, Maine, 1960-80’s)

- Dominant paradigm in developmental psychology pioneered by John Bowlby.
- A toddler has one of four types of attachment with her/his primary caregiver depending on their relationship, crucial for the child’s emotional development and the “internal working model” throughout life:
  - Secure attachment (loving parent)
  - Avoidantly insecure (rejecting parent)
  - Anxiously insecure (inconsistent parent)
  - Disorganisedly insecure (frightening parent)

- “Attachment insecurity is a major contributor to mental disorders” (Mikulincer and Shaver 2012)
Secure attachment circuits in the first year  
(Allan Schore, 2003)

• The loving mother - through mutual gaze, mirroring, singing, dance and play - attunes, resonates and fine tunes with and thus regulates the baby’s affective states, maximizing positive and minimizing negative affects.

• Synchronized right brain – right brain interactions in the mother-baby dyad greatly increase dopamine and endogenous opiates, inducing rapid growth of the baby’s brain.

• The orbital prefrontal cortex develops as the executive director of the limbic system, to regulate and delay response to arousal of emotions.

• The child slowly acquires a mental image of the loving mother, an internal model/neural circuits used increasingly in the absence of the mother too.
Attachment Objects in Ethology

• Rhesus monkey infants spent far more time with Harry Harlow’s **cloth covered** surrogate mothers than **bare wire surrogate mothers**.

• When the infants had no choice they developed very differently.

• Infants with cloth covered surrogate mothers later would make **bodily contact with their mothers and calm down** when scared.

• Infants with bare wire surrogate mothers, however, did not retreat to their mothers when scared.

• Instead, they threw themselves on the floor, clutched themselves, rocked back and forth, and screamed in terror.

• Infants used the cloth covered surrogates as an **attachment object for emotion regulation**, a form of self-attachment.
Attachment Objects in Human Children

• With their large pre-frontal cortex, humans invest high emotional significance to and **bond with inanimate or abstract objects**, which mediate self-directed behaviour to contain anxiety and provide inner peace.

• Donald Winnicott: Children passionately bond with “**transitional objects**” such as a pillow or a blanket as a “comfort object”.

• Comforting properties of a **good enough mother** are projected to the transitional object.

• By interacting with the transitional object, a mother substitute, the child then acquires **the capacity for self-soothing**.
Religion as Attachment Object

• “The idea of God is the idea of an absolutely adequate attachment-figure.” (Gordon Kaufman, 1981).
• In Christianity, Granvist, Mikuliner & Shaver (2010):
  1. Phenotypic resemblance between relationship to God and relationship to parents centred around love
  2. Common attributes of “availability” and “benevolence”
  3. Similarities in attachment behaviour: “proximity seeking” and “perceived omnipresence”
  4. Similarities as “safe haven” and “secure base”
• Islamic spirituality, Ghobary Bonab, Miner & Proctor (2013)
Human bonding examined with fMRI
(Bartles and Zeki, 2000 and 2004: Schjødt et al. 2008)

• Mothers, respectively adult lovers look at photos of their loved ones and some other children, respectively some other friends.

• Activated brain areas of mothers overlap with romantic lovers in dopamine producing caudate nucleus, the reward pathways when looking at the photos of loved ones.

• Deactivated brain areas for maternal and romantic love overlap in regions associated with negative emotions, social judgment.

• Caudate nucleus is activated in devout protestants when praying, but only if they regularly pray at least three times a week.
Neural attractors in the brain

• Attachment types and internal working models create **strong neural attractors** with large basins sculpted in the brain by repetition of **similar experiences**, optimal or suboptimal.
• They dominate in our interpretations, decisions, behaviour.
• Other examples in which strong attractors are shaped:
  • Attachment to a deity
  • Children’s attachment to transitional objects and the associated narratives.
  • Infant monkey’s attachment with cloth covered surrogates and the associated soothing effects.
Modelling attachment in neural networks

• **Hopfield neural networks** are used to store and retrieve memory.

• A neuron either is on with value 1 (firing) or is off (not firing) with value -1, a vast simplification of the real situation.

• Between any two neurons there is a connection weight.

• The state of a neuron (+1 or -1) will be renewed one at a time depending on the states of other neurons and the weights.

• Hopfield network is initially trained to store a number of patterns or memories using a Hebbian learning rule.

• The network has an energy value for each configuration which decreases any time the network is asynchronously updated.

• It is then able to recognise any of the learned patterns by exposure to only partial or even some corrupted information about that pattern.
Hopfield neural network usage Example

Create Neural Network (100 Neurons)
Add pattern to Neural network
Run network dynamics

Properties of Neural Network:
Size of Neural Network: 100
Number of patterns: 3
Current value of Energy: 0

Patterns in NN
A
B
C

Current State of NN

Create Neural Network (100 Neurons)
Add pattern to Neural network
Run network dynamics

Properties of Neural Network:
Size of Neural Network: 100
Number of patterns: 3
Current value of Energy: -5542

Patterns in NN
A
B
C

Current State of NN
Artificial brain: from depression to happiness
(A.E. & Mancinelli 2013, A.E. 2013)

• Train a 50 x50 network with 30 copies of a sad smiley and single copies of up to 30000 random images

• Depressed brain: any random image is interpreted most likely as a sad face

• Now in addition train the network with 40 copies of a happy face

• If now exposed to a random pattern most likely the happy face is retrieved.

• The depressed brain has undergone psychotherapy
Holistic intervention to heal psychological disorders

• To tackle the root of disorders, in adults with suboptimal internal working model:
  
  • Create a new strong neural attractor in the brain to make a fresh start in emotion regulation by emulating loving parents.

  • The new optimal neural attractor will challenge and eventually contain the sub-optimal attractor.

  • Under high stress we find temporary regression to the sub-optimal attractor, but shorter and less painful.

  • Experiments in artificial neural networks confirms this change in the dominating attractor.
  
  (A.E. & Mancinelli 2013, A.E. 2013)
Self-Attachment therapy: Make a Fresh Start

• Create new optimal strong attractors by emulating mother nature.
• The brain is comprised of “two individuals”:

(i) Adult self: a thinking/reasoning faculty with neural activities mostly in the pre-frontal cortex or “left” brain
(ii) Inner child: a feeling/emotional faculty with neural activities mostly in the limbic system or “right” brain

• Three stages in self-attachment algorithm to become your parent:

1. Connecting: Adult connects to the inner child with compassion.
2. Bonding: Adult self creates an internal affectional bond with the inner child, subjectively experienced as “falling in love”.
3. Re-parenting: Adult practices with the inner child to regulate arousal, minimise negative affects and maximise positive affects.
Examples of exercises

- **Affect regulation for a trauma (Sad_Child):** The individual imagines the traumatic scene in which the adult self imaginatively intervenes to comfort verbally and physically the inner child.

- **Habituation to singing a happy song (Happy_Child):** The individual learns the happy song by heart and sings it to the inner child imagining that it helps to raise the child to emotional maturity.

- **Promising results in over a dozen uncontrolled case studies of chronic depression and anxiety.**

- **High rate of compliance, quick time of symptom alleviation compared to other techniques such as CBT or schema therapy.**
Rudiments of Self-Attachment in Ethology
(John Capitanio 1986)

- Non-human primates exhibit abnormal self-directed behaviour when subjected to isolation in their early lives.
- One type of self-directed behaviour mimics certain calming or stimulating interactions with a mother monkey.
- In the absence of a mother to suck on, cling to or be stimulated by, the isolated infant monkey engages in self-orality, self-clasping or rocking.
- Since this self-directed behaviour, a form of self-attachment, is not learned, it must be part of the attachment system initially discovered by John Bowlby.
Other results and future work

- Four other mathematical models for self-attachment
- Controlled pilot study
- Controlled double blind randomised clinical trials
- fMRI studies
- Tailoring self-attachment protocols for different types of disorders and mental illness
- Improving neural models of self-attachment
- Mobile app for self-attachment
- A virtual reality environment for self-attachment

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