The Social Brain: Perspective of a Psychiatrist-in-Training

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The Psychiatry Trainee’s Dilemma

- MS: Child Psychiatry Fellow on committee for 2 years
- Psychiatry divided in biological & psychological
  - Each gives different explanation:
    - For why patients suffer
    - For treatment choices
  - Divides psychiatric faculty
  - Psychiatry training affected in residency and fellowship
  - Affects available future professional opportunities
- “Social brain” model helped MS integrate 2 spheres.
T.M. Luhrmann wrote

(in) *Of Two Minds: The Growing Disorder in American Psychiatry*

“Young psychiatrists are supposed to learn to be equally good at both talk therapy and drug therapy, psychotherapy and biomedical psychiatry, and the American Psychiatric Association thinks that this integration is what training programs in psychiatry teach. Psychiatrists are supposed to understand these approaches as different tools in a common toolbox.”
“Yet they are taught as different tools, based on different models, and used for different purposes. Some psychiatrists do integrate them to some extent. But those who do have to integrate two approaches that are different from the outset that carry with them different models of the person, different models of causation, and different expectations of how a person might change over time.”
Problems for Patients

• Psychiatrist division & confusion about the cause and treatment for illness so patients feel so equally or more
  – Chemical imbalance or genetic in nature (biological)?
  – Or social or psychological?
  – If chemical or genetic in causation, why use psychotherapy?
  – If psychological/from family or upbringing, then why medication?

• Social brain explanations clarify psychiatric illness
  – In my own mind,
  – In the minds of my patients,
  – And more effective treatment strategies eventuate

• But social brain is what exactly?
The social brain framework helps organize and explain all psychopathology. A single gene-based disorder like Huntington disease is expressed to a large extent as social dysfunction. Conversely, traumatic stress has structural impact on the brain as does the socially interactive process of psychotherapy.
Social Brain Definition II

• The social brain concept suggests
• Unifying explanation for how brains developed
• Why mental illness exists and how it affects us
• It offers hope for how to treat mental illness more effectively using a unified approach.
Social Brain Definition III

- Psychiatric disorders fundamentally entail social communication problems for those afflicted.
- Successful human interaction depends on communication with other people.
Social Brain Definition IV

• Attachment stems from collaborative communication.

• Secure attachment involves contingent communication,
  – Signals from one person gain direct response by the other

• Children learn from parents
  – Good, loving and functional patterns of behavior or
  – Dysfunctional behaviors, e.g.
    • Aggression
    • Poor responses to stress, or
    • Substance abuse
Social Brain on Shoulders of Biopsychosocial

- Medical students & residents learn biopsychosocial (BPS) model of Engel
  - But they integrate it into practice with difficulty
  - Gains mention merely in case formulations
Social Brain on Shoulders of Biopsychosocial

• Problem: BPS model often justifies role limits
  – Psychiatrist assumes responsibility for drugs
  – Psychologist & social worker do their respective parts of “biopsychosocial”
  – Term used quite literally to un-integrate treatment
Social Brain Integrates

- When available and done in an integrated manner, the team approach works
- & all patients, even when no team involved,
  - Benefit when viewed with 3 components combined
- Doesn’t replace BPS: social brain idea extends it
Social Brain Integrates

• Brain involved in & resulted from social interactions, therefore
  – Social brain defines a biological system at the biological, psychological, and social intersection

• All thoughts and emotions stem from neural connections and neurotransmitters in the context of social learning
Social Brain Integrates

• Interactions possess evolutionary origins
  – Across all human beings
  – Across other species
  – As well as individual origins
    • Within each person’s early development
    • And during life later also

• Social brain includes language communication
  – With others
  – A person may communicate with self about self
Social Definition in *DSM-IV*

- Psychiatry’s social component critically figures in any DSM-IV diagnosis.
- Patient’s inability to function socially or occupationally (occupations represent social functions) makes a critical diagnostic distinction.
Social Definition in *DSM-IV*

- Throughout *DSM-IV*, we read:
  - “The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.”
  - Helps diagnose Major Depressive Episode, Dementia, Generalized Anxiety Disorder, Personality Disorders & others.

- Other specialties differ
  - Cardiologists do not need social function to define MI
  - How one works does not help define diabetes in endocrinology
Social Definition in *DSM-IV*

- Manic Episode: “The mood disturbance is sufficiently severe to cause marked impairment in occupational functioning or in usual social activities or relationships with others, or to necessitate hospitalization to prevent harm to self or others, or there are psychotic features.”
- A Schizophrenia criterion refers to social or occupational dysfunction
Social Definition in *DSM-IV*

- Substance Abuse diagnosis includes the criterion of “failure to fulfill major role obligations at work, school, or home.”
- Many childhood psychiatric disorders possess definitions partially based on the child’s poor social interactions
  - Pervasive developmental disorders quintessentially defined by social interactions
Patients Served Badly by Molecule Model Alone

• So in view of psychiatric disorders definition,
  – We do disservice to our patients when these illnesses receive biological treatment only
  – As though therapy focused on bad molecules alone

• Using medication constitutes a critical starting point for many patients
  – But their social functioning must improve from drug action
  – Or a correlated placebo effect

• Must keep in focus social functioning to help patients heal fully
ADHD Selected For

- Some have examined ancient human ancestors
  - GAP Child Committee asked:
  - Did social environment affect human brains in evolutionary times?
- Through an evolutionary biological lens, some mental disorders seem an adaptive response to early pathogenic environments
- And/or they reflect the optimization of brain function to some environments at the cost of poorer response to the demands of other environments
- Given current estimated frequency of ADHD (3% to 5%):
  - Seems likely such prevalence maintained by selection forces
  - Certain advantages provided by ADHD characteristics/associated traits
How ADHD Selection May Have Worked

• Early environmental experiences impact structural and functional aspects of cortical development, neuronal activity, & organization

• Early pathogenic environments likely included harsh prehistoric environments
  – To which all humans had to adapt
  – Then/currently, this may include trauma & neglect
    • To which a child often must adapt individually
How ADHD Selection May Have Worked

• Child Committee article examined hunter-gatherer societies & stated:
  
  • Some human survival may have depended on hypervigilance
   – “Integrating information through all senses at once,”
   – Being impulsive – “quick to pounce”
   – Hyperactivity
     • As in foraging for food
     • Moving toward warmer climes
       – As seasons & ice ages come & go
How ADHD Selection May Have Worked

- Also, a “response-ready” individual might possess advantage in brutal or harsh circumstances
  - of frozen steppe or humid jungle
- Contemplative, more phlegmatic individual may have experienced “environmentally challenge”
Was Anxiety Selected For?

- This lens ➔ fresh perspective for Anxiety Disorders: thus, in the ancient past
  - breathing & heart rate if increased rapidly with an autonomic system showing a low threshold for arousal
    - Might have escaped the tiger
  - But in today’s environment anxiety or panic attacks do not save one from workplace problems
    - However tiger-like a boss may seem
Group Membership

- A neuroimaging study examined subjects rejected by peers in a computer game
  - Brain reacted to social rejection as it reacted to pain
    - In same manner
    - In same anterior cingulate cortex location
- Our brains wire us as social animals.
- Anciently survival likely depended on group-membership so that
  - Pain of social rejection → people to remain in social groups
Gene-Life Stressors Interact For Depression

• 5-HTT gene has a promoter region
  – either short or long allele

• Result: Depression more likely with double or single copies of short alleles (s/l or s/s)

• Stressful life events = problems with employment, finances, housing, relationships and the social stress of physical health problems
Gene-Life Stressors Interact For Depression

• More detail: if 4 or more stressful life events happen between the ages of 21 and 26,
  – 33% of those with at least one short allele (s/s or s/l) became depressed
  – compared to 17% of those with the l/l genotype.

• The study also examined associations between childhood maltreatment between ages 3 and 11 years and adult depression (ages 18 to 26).
Gene-Life Stressors Interact For Depression

• Childhood maltreatment predicted adult depression among individuals carrying an s allele
  – Not among the l/l individuals.
  – l/l abused children may get depressed
    • (But if so, it did not correlate with later depression)

• Over half of Caucasian population has s allele
  – No data on other races
Verbal Communication

• Adaptation over evolutionary time wired human brains for communication among people
  – Large brain proportion for communication

• Cerebral cortex does verbal & nonverbal messaging
  – pattern recognition & pattern generation for writing
  – facial recognition
  – planning behaviors
  – suppression of impulses from lower centers.
Stories

- Verbal communication includes human capability critical for using detailed stories to
  - inform
  - plan
  - bonding
  - gossip,
  - entertain
  - help one another in the many ways we do
Learning Through Social Interactions

- Research on stress and genes indicates
  - Social interactions → neural connections
    - do not end in early development.
  - Social interactions more influence receptive brains early
    - Neurons more plastic then
    - But brains continue development throughout life
Learning Through Social Interactions

• Learning causes new connections in brain

• This happens through relationships
  – People learn new ways of handling situations
  – Such happens through psychotherapy.

• Important learning with parents, siblings, spouses, friends, children, workplace & community
Beliefs

• We frequently test beliefs and change them
• In isolation, belief change harder
  – Versus discussing ideas with another who
    • Reinforces or
    • Provides a new perspective
• If a new perspective stems from another, one changes beliefs more readily
Beliefs

• Some stick to dysfunctional relationship patterns
• Those thrive best if open to life-long learning
• They work on improving relationships by
  – Testing out old patterns of behavior
  – Rejecting dysfunctional beliefs
  – Developing new beliefs
  – Evolving new approaches to life
Social Learning Theory

- **Rockland**: Behavior, personal factors, and social forces all operate as interlocking determinants of one another
  - Behavior stems from the environment
  - People play roles in creating the social milieu & other circumstances that arise in their daily transactions.

- **Humans**: advanced capacity for observational learning
  - Enables them knowledge and skills expansion
  - From modeling influences
Two Memory Systems

- Learning involves two memory systems used together
  - Declarative or explicit system and
  - Procedural or implicit system involves
    - Striatum mediate skills & habits
    - Amygdalae (+ neocortex & cerebellum) mediate emotions
    - Unconscious physical & emotional memories work in these
  - When something new learned, declarative memory works 1st
    - & procedural memory to variable extents
  - Constant repetition moves declarative to procedural
    - Such as driving a car
Two Memory Systems

• Experience of frightening situation or traumatic event
  – declarative memories in hippocampus mix
  – with emotional memories in amygdala
  – Person may later feel depressed & anxious when emotional memories reactivate

• Procedural and emotional memories in the amygdala
  – May → body’s autonomic system
    • leading to fight or flight reactions
    • Faster breathing & heart rate with sweating skin
  – Reactions = PTSD symptoms.
Brain-Affected Patients

- Combined medication & psychotherapy works better than either alone
- Even diagnoses viewed as primarily “biological” benefit from psychotherapy
- Psychotherapy of course is not unbiological
ADHD

- ADHD exemplifies a disorder with a large neurobiological & genetic component
- NIMH Collaborative Multisite Multimodal Study of Children with Attention-Deficit/Hyperactivity Disorder (MTA):
  - Combined medication-behavior management = 68% success
  - Medical management only = 56% success
  - Behavior therapy alone = 34% success
  - Combined improvement compared to others statistically significant
Combined Bipolar Treatment Best

- Agreement: one with bipolar disorder needs medication
  - Yet psychotherapy makes a significant difference
- Lam et al examined cognitive therapy adjunctively
  - 103 patients with bipolar disorder
  - Randomized design
- Cognitive tx group: 14 psychotherapy sessions in 1st half year 2 booster sessions during 2nd half year
- Relapse results over the year:
  - Without cognitive tx: 75 %
  - With cognitive tx: 44 %
Combined Bipolar Tx: More Results

- Controls without cog tx:
  - >3-fold more time in bipolar episodes (mean, 88 days)
    - Compared with cognitive therapy group (mean, 27 days).
  - 33% without cog tx needed hospital adm for bipolar episodes
    - Compared to 15% of patients with therapy

- Cognitive therapy: patients developed skills to monitor moods
  - Plus any prodromal symptoms
  - Modified moods/behavior before prodrome full-blown

- Therapy promoted sleep & routine
  - Also medication compliance
Combined Schizophrenia Tx

- Psychotic beliefs blossom if
  - Isolation continued
  - No opportunity nor desire to reality-test

- Cognitive Behavioral therapists encourage patients
  - To examine alternative explanations
  - With sometimes profound results, e.g.,
    - When auditory hallucinations become not outside force
    - But strong thoughts in their heads.

- Patient may also learn behavioral techniques that stop voices
  - This reduces stress to internal voice with lessened reaction

- Changes in cells and molecules still result in schizophrenia but
  - Isolation + lack of reality testing → worsened illness
MS Experience with OP Tx of Schizophrenia

• Co-led with M.W. Deibler group with schizophrenia.
  – Several heard auditory hallucinations during sessions.
  – Focused on testing out behavioral strategies, such as humming or reading, to control auditory experience
  – Plus looked at alternative explanations for voices

• Social form of group therapy proved helpful to several
  – Isolative hallucination changed to controllable experience
  – Observational learning when saw others learn to cope
Turkington: OP Tx of Schizophrenia

- Psychologic meanings help in psychotx adjunctive to medication
  - Beneath systematized delusions and derogatory hallucinations lies a personalized meaning, or a schema, that drives symptoms
  - A personal storyline
- “I am a bad person” idea may foster a voice that expresses it
  - In response, patient forms beliefs about the voice,
  - e.g., devil speaks, or alien sources produce the sounds
Turkington: OP Tx of Schizophrenia

• Frightening interpretations may trigger anxiety & withdrawal
  – This worsens more hallucinations & other symptoms
• Cognitive & behavioral interventions
  – Include alternative explanations for the voices
  – Relaxation training to reduce anxiety,
  – Activity scheduling,
  – A voice diary to encourage patients to dispute the content of the voices
    • therefore to gain control over them
  – Plus other strategies for advanced coping
Split Treatment: Challenge

• So social brain thinking with implications means
  – Psychotherapy & other social interventions should happen as well as medication

• Challenge: combined approach difficult
  – In era of managed care
  – Split model of psychiatrist-therapist

• Separate functions determined by funding
Split Treatment: Challenge

- Many work where medicating = responsibility
- But patients’ social relationships help understand recovery
- Should enhance the placebo effect to its fullest
- Engage meaningfully with patient
  - Inquire on compliance
    - Including reasons for non-compliance
Split Treatment: Challenge

• Must meet with families as well as patients as the circumstance warrants
  – For children, this takes on critical dimensions

• Plus abbreviated psychotherapy may happen in limited time

• If framework of split treatment model holds
  – Then work with therapists/social workers ➔ more integrated approach
Split Treatment: Challenge

• Many psychiatrists for various reasons choose to focus more on the biological side of psychiatry,
  – They limit their model of diagnosis & treatment
• But error to omit recognition/appreciation of the social side of treatment
  – Incredibly important
  – regardless of how intervention happens
• Plus we need to assist patients in social interactions in the community and with their families
  – Think of vocational training or continuing education
Split Treatment: Challenge

• Even with a newest antipsychotic or antidepressant
  – Just sitting home alone bored
  – Patients more likely relapse into depression or psychosis

• As one woman with schizoaffective disorder said
  – “An idle mind is the devil’s workshop.”

• Vocational Training doesn’t work in all cases, but
  – When it does it gives a purpose in life
  – It enhances quality of life & self-esteem.

• It provides an identity beyond that of patient.
MS Conclusions for Psychiatrist in Training

- As a psychiatrist in training, I felt excited
  - About using various sociophysiological interventions
  - Only with both communication & drugscan one most effectively treat

- *Psychiatric Annals* offered a past issue on treatment resistant depression
  - ECT, adjunctive medication, & cognitive behavior therapy each possessed empirical support

- To help patients best
  - Patients need biological, psychological & social interventions
  - According to particular situations & characteristics
References