

The Social Brain: A New Perspective

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Currently the goal of the Medicine and psychiatry is the person neither the organ nor the function. The scientific foundation of social brain reflects the integrative values of the social brain concept, retaining the biomedical base while also emphasizing affective, moral, and cultural developments of interacting people¹.

Evolution of man went through many phases, human beings started evolving about 7 million years ago from ancestral forms in Africa, homo sapiens appeared about 500,000 years ago, used crude, stone tools and fire, 40,000 years ago, Cro-Magnons (modern man) left evidence of stone age and bone tools, created nets, jewelry, clothes, spears, bows and arrows. They also painted, sculpted and played musical instruments.

A resume of agricultural and industrial revolution will be attempted. Ships appearing 13,000 years ago made it possible for people to travel, the agricultural revolution commenced about 10,000 years ago in the Middle East, China and Mesopotamia, this allowed more people to live in stable areas without needing to move for food, after their domestication in about 4,000 BC, horse's enhanced travel and farming. Gene-culture evolution represents a special form of natural selection, the concept of the social brain provides a focus for study of this special form of co-evolution, as culture

provides a special environment for behavioral genes².

Bodily expression of a mental illness represents an attribution more common than psychological, the criteria used for psychiatric diagnosis in the United States concentrate on psychological presentations that may be unsuitable for diagnoses in non-western areas. People from non-western cultures often receive misdiagnosis and incorrect treatment due to social perception barriers, some psychological areas do cross cultural boundaries, and people in all cultures accurately detect the facial expressions of fear, anger, disgust, sadness, surprise, and happiness³.

The evolution and development (Evodevo) of humans

The human genome uses tens of thousands of protein-encoding genes (Proteimomes) more sequence tags (messenger RNA) exist in the brain more than any other organ, apparently to foster brain function. A new research field called "evo devo" (evolution and development) explores emerging conceptions about consistencies in molecular building blocks of animal structure and development that have persisted over evolving time, delineating differences that have resulted in the many species and the individual differences within species. Such similarities and contrasts include sociality. In the past 3

million years of developmental trial and error in the evolutionary process, brain volume increased about four fold, the neocortex comprised much of this growth expanding areas of language and its symbol based product and culture. Having a large brain in humans, however, does not always indicate increased function for example; autistic people often are retarded intellectually and are asocial but may have large brains. It was found that social group size accounts for 45% of brain-size variance. Human brain studies further show that localized areas process emotional content and social cognition, including the amygdala, prefrontal cortex, and the right somatosensory cortices. Positron emission tomographies studies show how the medial prefrontal areas and the thalamus are activated during normal emotion, anterior insular region invest cognitive and sensory information with negative emotional meaning. Ethical dilemmas activate emotional areas of the brain such as the medial frontal gyrus, posterior cingulate gyrus and angular gyrus. Sexes differ in moral response; a woman's standards tend to involve responsiveness to others, whereas men's morality involves rules of fairness and separateness. In both sexes, emotions generated by moral decisions activate the neurotransmitters, dopamine and serotonin which relate to positive and negative feelings; Dopamine is a "pleasure chemical" released after eating, pleasant sexual interaction or taking cocaine. Decreased serotonin connects to the negative feelings of depression, suicide, anxiety and social phobia, whereas serotonin reuptake inhibitors increase optimism and social confidence⁴.

In genomic imprinting, the same gene expresses different characteristics depending on whether the mother or the

father furnished the DNA. Part of the imprinting process involves DNA methylation which switches off gene expression. Interaction between parents and their children can have profound developmental effects. Children who receive more maternal affection than their siblings express less depression or other internalizing symptoms at later life, if parents display physical conflict, and children show more problems than parallel exposure to verbal conflicts. When mothers maltreat their infants, 82% of the children show disorganized behavior at age 12 months compared with 19% of controls.

Maltreated infants withdraw physically and emotionally, using fewer words than non-maltreated infants, young mothers display less sensitivity to their children but more intrusiveness. The children show more avoidance. Punitive discipline results in more aggression, impulsivity, social withdrawal and fewer friends⁵.

Bilateral amygdala damage impairs the patient's ability to recognize facial expression of fear. Healthy persons' ability to identify facial expression showed that euthymic bipolar and healthy persons scored similarly, manic patients had deficits in recognizing negative emotions, particularly fear and disgust. They frequently evaluated a frightened face as expressing surprise.

Gender Differences

Intimacy tends to threaten men. Divorced men remarry faster and more often than divorced women. Men exhibit less depression than women, and respond faster to treatment. Women, on the other hand, show more panic disorder and somatization disorders⁶.

Men exhibit more alcohol dependence, antisocial personality disorder, delusions about homosexuality, paranoid disorders, and compulsive disorders, men show more psychological and physical distress than women from separation and divorce.

Ethnic Differences

American Indians, Alaskan Natives and Southeast Asians possess no word for "depressed". Eskimos and Tahitians rarely show anger, Iranians encourage but Navajos discourage displaying extreme sadness.

Women staying at home at all times might be agoraphobic in the West but virtuous if Muslim, culture-bound disorders exist in all countries, and their reasons stem from anger, fright, witchcraft, "evil eye" preoccupation with bodily function, or other precipitants. In the West; Caucasians particularly struggle for thinness, while in some countries; only overweight people gain attractive status. Heavy alcohol use characterizes some groups in northern and western countries, Buddhist monks do not drink alcohol, nor do Muslims.

Languages shape thinking and new words provide ability to think in new patterns, a Pygmy chimpanzee learned to respond to oral English language to an extent comparable to a 2 year old human infant. Japanese and American Indian languages contain no native swear words. An extremely crude swears word may arouse anger in one culture but no emotional reaction in another culture⁷. You can perceive the current Egyptian language!!

Two prefrontal areas, dorsolateral and orbitomedial operate in working memory, damage to the first impairs regulation and integration of cognition; damage to the latter impairs emotional and social contact,

one factor regulating the neuronal replacement appears to be sensorimotor stimulation. Such neurogenesis decreases with stress, a boring environment, and perhaps depression. Storing memory in humans is associated with increased size of the left hippocampus; lack of neurogenesis in olfactory bulb neurons may produce lessened olfactory identification as an early problem in Alzheimer's disease⁸.

Repeated restraint stress may produce many sequelae, dendrites remodeled, neurogenesis inhibited, memory impaired, fear increased, aggression increased. HPA habituation, social interaction leads to neurogenesis and proliferation of dendrites in cells of the hippocampus and increased dopamine in the dopaminergic reward pathways, lack of social interaction leads to atrophy in cells of the hippocampus, decreased dopamine together with hopelessness and helplessness.

Social Capital

It is defined as the ties that bind families, neighborhoods, workplaces, communities, and religious groups together and find that it correlates strongly with subjective wellbeing, in fact the breadth and depth of individuals' social connections is the best predictors of their happiness⁹.

Indeed psychiatrists presently need great knowledge of the brain's anatomy and physiology, with the molecular biology of information processing carrying special relevancy.

We have proposed that the primary focus of psychiatry is on the social brain that is, the brain as a part of the human social environment, although psychiatry proper deals with people, the social brain

perspective extends to non-human creatures, a broader biological definition holds the social brain as "the brain in interaction with nonspecifics" (members of the same species), the brains of all animals mediate their social and reproductive lives. It would be difficult to identify a brain part or system not figuring in social interaction. Seeing psychiatry's core organ as the "social brain" redefines and extends the basic science of psychiatry.

Mirror Neurons

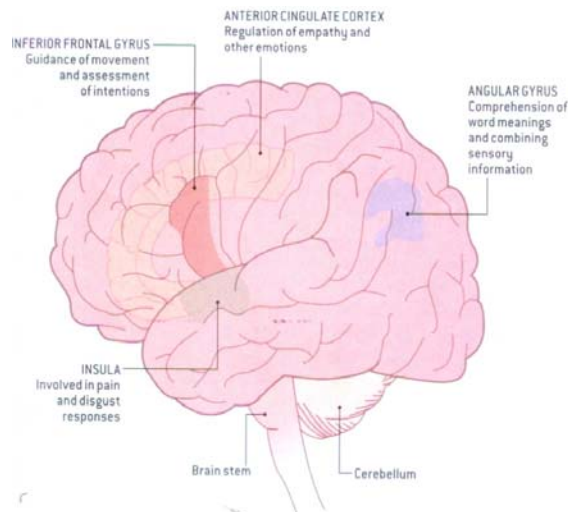
Subsets of neurons in human and monkey brains respond when an individual performs certain actions and also when the subject observes others performing the same movements. These "mirror neurons" provide a direct internal experience, and therefore understanding, of another person's act, intention or emotion, mirror neurons may also underlie the ability to imitate another's action, and thereby learn, making the mirror mechanism a bridge between individual brains for communication and connection on multiple levels. Understanding the intentions of others is fundamental to human social behavior. Human mirror neurons appeared to confer that ability in an experiment designed to test their intention recognition, a newly discovered class of nerve cells in the brain called mirror neurons, which appear to be involved in abilities such as empathy and the perception of another individual's intention¹⁰.

Mirror Neurons and Autism

People with autism show reduced mirror neuron activity in the inferior frontal gyrus, a part of the brain's premotor cortex, perhaps explaining their inability to assess the intentions of others. Dysfunctions of mirror neurons in the insula and anterior

cingulate cortex may cause related symptoms, such as the absence of empathy, and deficits in the angular gyrus may result in language difficulties. People with autism also have structural changes in the cerebellum and brain stem (fig. 1).

Figure 1: The Anatomy of Autism



Mirror neurons appear to be involved in social interaction, dysfunctions of this neural system could explain some of the primary symptoms of autism, including isolation and absence of empathy. A lack of mirror neuron activity in several regions of the brain is reported in autism. Treatments designed to restore this activity could alleviate some of autism's symptoms. A complementary hypothesis, "the salience landscape theory", could account for secondary symptoms of autism such as hypersensitivity.

Some have shown elegantly that children with autism have characteristic abnormalities in the cerebellum, the brain structure responsible for coordinating complex voluntary movements; some posit that the main abnormality in autism is a deficit in the ability to construct a "theory of other minds".

The possibility that children with autism have a distorted salience landscape, tend to be related to the altered connections between the cortical areas that process sensory input and the amygdala or between the limbic structures and the frontal lobes that regulate the resulting behavior. As a result of these abnormal connections, any trivial event or object could set off an extreme emotional response an autonomic storm in the child's mind; this hypothesis would explain why children with autism tend to avoid eye contact and any other novel sensation that might trigger an upheaval. The distorted perceptions of emotional significance might also explain why many children with autism become intensely preoccupied with trifles such as train schedules while expressing no interest at all in things that most children find fascinating. If the child's mirror neuron functions are dormant rather than lost, it may be possible to revive this ability, the two candidate theories for explaining the symptoms of autism mirror neuron dysfunction and distorted salience landscape are not necessarily contradictory¹⁰.

The four Ps

Any psychiatrist is a "social brain psychiatrist" when interviewing the patient, the psychiatrist establishes rapport, focusing on the phenomenology and history of illness and its course, and exploring "the four Ps": predisposing factors (family history, early childhood and so forth), precipitating factors (stressful events and life situations), perpetuating and protective factors (support structure, strengths and weaknesses).

The social brain concept facilitates consideration of the dynamic interplay between the "four Ps". It reaches for a

tentative and hypothetical yet coherent and etiological explanation of the patient's condition. It's emphasizes the unity of nature and nurture and focuses on interactions and on the relationships between people, rather than keeping the clinician trapped in a tunnel vision that centers exclusively on intra-psychic dynamics or isolated biochemical processes. Patients with depression experience a deep sense of social loss, these patients feel isolated and excluded, as if they no longer belong to the social group, failures of attachment, desire, resources, belonging, and status and respect¹¹⁻¹².

Human Propensities Related to the Social Brain can be summarized as:

- Humans are inclined to form attachments and to maintain closeness to a preferred partner.
- Humans tend to form alliances with others throughout the life span.
- Humans tend to adjust to existing social rank orders, and to insert themselves into new ones.
- Humans desire to pursue sexual encounters and to engage in them.
- Humans long to reproduce, to bring up children, and to assist others in the raising of their children.
- Humans care for relatives and for other people in need of help.
- Humans tend to identify with an "in-group" (e.g., one's family and the religious, national, ethnic or other groups to which one belongs).
- Humans incline to exclude "out-group" people (i.e., humans of other families, especially those belonging to different religious, national, or ethnic groups). Members of the out-group often are demonized and treated with contempt or fear.

- Humans tend to defend personal territory, with occurrences on many levels of abstraction, from the body buffer zone (the point where another's approach becomes uncomfortable) to possessions and resources, and even to areas of expertise (one's "turf").

GET HAPPY. IT IS GOOD FOR YOU

Embark on a loving relationship with another adult, and work hard to sustain it, plan frequent interactions with friends, family and neighbors (in that order). Make sure you're not working so hard that you have no time left for personal relationships and leisure, in your spare time. Augment your faith, join a club or volunteer for community service. Happiness should become the goal of public policy and the progress of national happiness should be measured and analyzed as closely as the growth of gross national product. We should promote human happiness and reduce human misery¹³.

Social network is the best strategy for a better quality of life!

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