While engaged in organizing the psychosis panel for the NYU Postdoctoral conference “The Biology of Mind,” my colleague on the panel, David Silbersweig, co-director of the neuroimaging lab at Weill Medical College of Cornell University and NY Prebyterian Medical Center, spoke of the overlap between contemporary neuropsychiatric and psychoanalytic models of the schizophrenias. He and I both saw the strong convergence, particularly in regard to limbic system involvement in the mediation of such psychotic symptoms as delusions and hallucinations. From my perspective, improvement in the patient’s levels of terror and fear led to more stabilized neural functioning, i.e., reduction of limbic hyperarousal resulted in a reversal of such states as hyperfrontality. The latter has been considered by reductionistic biological theorists as an endophenotype in severe mental illness. However, a colleague in the international CBT and psychosis group organized by Aaron ‘Tim’ Beck, Til Wykes and her colleagues at the Institute of Psychiatry in London, demonstrated a reversal of this state in persons with schizophrenia through a psychosocial intervention which they call cognitive remediation treatment (CRT).

Very recently, there has been a unique convergence of points of view emerging from very strangebedfellows: psychoanalysis and neuroscience. I will contrast two, what I consider prototypical representatives, articles: “As active psychosis neurotoxic?” by T. H. McGlashan” published in the Schizophrenia Bulletin (vol 32 no. 4 pp. 609-613) and “Psychotic withdrawal and the overthrow of psychic reality” by Franco De Masi published in the International Journal of Psychoanalysis in 2006 (vol 87 pp 789-807). I found the contrast and overlap between these two clinician/theorists to be illustrative of what could become a new approach to the deeper understanding and treatment of the major mental disorders, in particular, the schizophrenia spectrum disorders. De Masi and McGlashan are both widely respected authors in the field, the former a psychoanalyst of more deeply disturbed individuals and the latter a more biologically oriented researcher/clinician. Contrasting these two theorists is like shining a beacon on the most significant issues in our contemporary understanding of severe mental illness.

First, I shall summarize the McGlashan article. In this article, he approaches the question, which has been taken as dogma by many in our field, is active psychosis, i.e., the presence of hallucinations and delusions, neurotoxic? The prevailing viewpoint is that indeed it is and that neuroleptic agents, whether first- or second-generation, are neuroprotective: without their protective coverage, the “schizophrenic brain” will deteriorate further and that there exists a dose-response relationship between frequency of relapse and time to recovery, i.e., every psychotic relapse makes it much more difficult for the person to achieve stability. McGlashan orients us to the question by taking us on an abbreviated, but very relevant, tour of the history of biological psychiatry as applied to the schizophrenias, starting with the viewpoint of Emil Kraepelin on SZ an early form of dementia.
which is neurodegenerative. Manfred Bleuler, son of Eugen Bleuler who gave us the term “schizophrenia,” decades later, presented us with a more benign view of the course and outcome of the disorder. A review of retrospective data in chronic schizophrenia suggests that the deterioration is most apparent in the first three years of active illness. McGlashan, in commenting on the neuroanatomical research, noted:

“The data that have been produced support a picture of reduced synaptic connectivity between brain neurons rather than a reduction in the number of neurons. Postmortem histopathologic investigations found reduced spine densities and smaller dendritic arbors on the pyramidal cells of the cortex in schizophrenia. The most replicated postmortem finding has been increased neuronal density in the cortex resulting from reduced neuropil [axons, dendrites, etc.] without neuronal loss...Given the severity that schizophrenic deterioration can reach, the telltale signs of outright neurodegeneration were assumed to exist and were sought for time and again, but to no avail, leading experts in the field to conclude that postmortem neuropathology of schizophrenia yields no specific cell phenotype, no gliosis, and little to no cell loss” (p. 610).

The origins of the viewpoint that untreated psychosis, often referred to as DUP (duration of untreated psychosis), is neurotoxic and that neuroleptic agents, such as zyprexa, clozaril and risperdol, are neuroprotective can be traced back to the research of Wyatt. The latter concluded that antipsychotic agents treat active psychosis and prevent deterioration. Untreated psychosis came to mean untreated with antipsychotic agents. However, a research study by de Haan et al/ (2003) published in Schizophrenia Bulletin documented that withholding of psychosocial treatment can be equally, if not more, detrimental to psychotic patients (de Haan et al (2003). Duration of untreated psychosis and outcome of schizophrenia: delay in intensive psychosocial treatment versus delay in treatment with antipsychotic medication. Schizophrenia Bulletin, 29 (2), pp.341-348).

Research studies by Loebel et al. and Lieberman supported the view that there was a negative dose effect of active psychosis on long-term course, i.e., neurotoxicity. DUP was made a strong focus of research thanks to the efforts of Pat McGorry and colleagues at the Early Psychosis Prevention and Intervention Center (EPPIC) in Melbourne. Correlational data on the association between longer DUP and poorer outcome took on the weight of a causal relationship.

McGlashan gathers together a great deal of research evidence demonstrating that it could not be true that untreated active psychosis is neurotoxic. The latter does not behave like typical neurodegenerative illnesses, e.g., the the DUP effect plateaus (in fact the differences in outcome between a long and short DUP are minimal), we would not see neurodegenerative effects prior to the emergence of positive symptomatology, the relapse-dose effect would continue beyond the window of functional deterioration, etc. If DUP was neurotoxic, we would expect to observe evidence of neuronal death and/or gliosis as a reaction to neuronal death. The postmortem brains of persons with schizophrenia show neither gliosis nor loss of neuronal cell numbers for the most
part. McGlashan notes: “Once the plateau is reached, the positive symptoms of schizophrenia neither become more and more severe nor become harder to treat after each relapse” and “Neuropathology, like longitudinal course, does not support the hypothesis that untreated psychosis is neurotoxic” (p. 611).

McGlashan proposes an interesting alternative hypothesis to neurotoxicity: psychosis as emerging from reduced connectivity. This synaptic plasticity hypothesis centers on significantly reduced neuropil, ie, the synaptic syncytium between neurons. Hoffman and McGlashan (1993) demonstrated that such schizophrenic symptoms as auditory hallucinations can be simulated in computer models by reducing the connections within a putative neuronal network. This model proposes that reduced connectivity precedes symptom formation and generates characteristic psychotic symptomatology. McGlashan makes the bold claim that symptom formation, once present, can change levels of connectivity between neurons via positive and negative information feedback loops, eg, could chronic preoccupation with delusions and/or hallucinations, decrease the use of certain neural pathways leading to content-driven alterations in connectivity, ie, diuse atrophy in some circuits and overuse hypertrophy in other circuits. Now for the crux of his argument, McGlashan states:

“In such a system, any treatment (including antipsychotics) that reduces psychotic symptoms might also release the brain from its aberrant, symptom generating, wiring, and reengage the patient in a cognitive dialogue with the real world as opposed to a world of psychotic creations. Reunion with reality reestablishes a richer fabric of complimentary neuronal connectivity...Time and degree of immersion in a mental state of psychosis is the culprit here, leading to atrophy of wordly-wise judgment and skills and to atrophy of the synaptic connections underpinning these skills...Antipsychotic medication works...by reengaging the patient in the world on a more complex level with greater investment and cathexis, not by being ‘neuroprotective.’ The process mediating these changes, both destructive and ameliorative, is the process of learning, ie, changing synaptic plasticity, not changing neuronal number” (p. 611).

For McGlashan the problem in schizophrenia is significantly attenuated synaptic plasticity secondary to withdrawal from the daily commerce of living. Therefore, efficacious treatment must minimize psychotic distortions with medications and asylum firstly, and then attempt to maximize reengagement with reality via medications and outreach strategies which “...together preserve salience and promote real world investment” (p. 612). Minkowski (1927), like Eugen Bleuler (1911), was impressed by the nature of schizophrenic autism, the patient’s impaired vital contact with her or his world and incapacity to resonate, to establish meaningful emotional bonds with others. Gallese (2003b) commented on the patient’s difficulties in establishing a precognitive, intuitive interpersonal bond with an other in schizophrenia. It is McGlashan’s emphasis on withdrawal from the daily commerce of living which is a zone of convergence for the Post-Kleinian psychoanalytic viewpoint of De Masi which I will present here, but first I wish to make some points
which differentiates my position from McGlashan’s.

For almost two decades I have been calling attention to the fact that the neuroscience of severe mental illness overlaps significantly with the neuroscience of profound stress/fear/anxiety and the neuroscience of social isolation, exclusion and defeat. I have written many papers demonstrating this at the level of molecular biology, as well as at more macro levels of systems neurobiology and psychobiology. I do believe that psychotropic agents which reduce excessive cortisol levels, as do certain antipsychotic and anxiolytic agents and glucocorticoid antagonists, can potentially be neuroprotective, particularly if used in nonreductionistic ways. There is research data demonstrating that benzodiazepines can be very beneficial, e.g., minimizing stress-induced exacerbations of psychosis (Wolkowitz, 1996) as well as being effective when used as the sole agent in the treatment of schizophrenia (9 out of 14 double-blind studies demonstrated this, resulting in many authors claiming that BZs even when used alone may have mild antipsychotic efficacy in some patients. My colleague Yrjö Alanen, retired professor at the University of Turku, who headed a national schizophrenia project in Finland told me that approximately 50% of their newly diagnosed psychotic patients did not have neuroleptic exposure due to their emphasis on psychotherapy and the use of anxiolytic medications for sleep and agitation. Parenthetically, psychologist Jaako Seikkula and colleagues using their psychosocial treatment intervention called Open Dialogue Treatment (ODT), an approach which does not emphasize pharmacotherapy and focuses instead on developing a social network of family and helpers and involving the patient in all treatment decisions (something I never witnessed in my work in city and state psychiatric hospitals), in ongoing research in Finland, has shown that over 80% of those treated with this approach return to work and over 75% show no residual signs of psychosis. Official government statistics comparing 22 health districts in Finland found that Dr. Seikulla’s district was the only one not to have any new chronic hospital patients in a two year period and led the National Research and Development Center for Welfare and Health to award a prize for his 10 years of ongoing care of psychiatric patients.

Unlike McGlashan I see a significant role of sociocultural factors not only in the course and outcome, but also, in the initiation of the schizophrenic and bipolar disorders. There is emergent data, primarily from Europe, demonstrating this. In a recent review of the relevant research, Jane Boydell, Jim van Os and Robin Murray (2004), in their “Is there a role for social factors in a comprehensive developmental model for schizophrenia?” (contained in an excellent new volume “Neurodevelopment and Schizophrenia” edited by Matcheri Keshavan, James Kennedy and Robin Murray in 2004 for Cambridge University Press), noted:

“In the 1950’s and 1960’s, there was much extravagant discussion of the role of social factors in the etiology of schizophrenia. However, there was little scientific basis to this speculation, and it was swept away by the demonstration that people with schizophrenia showed abnormalities of brain structure on computed tomographic scans (Johnstone et al 1976) [it soon became apparent
to those of us who were studying both areas of neuroscience research, schizophrenia and the effects of profound fear/stress/anxiety/trauma/social isolation on CNS structure/function, that there was a substantial overlap between the two areas of scientific inquiry. A decade later, the neurodevelopmental model of schizophrenia was proposed, and it subsequently became the dominant etiological and pathogenetic model (Murray and Fearon, 1999; Murray et al., 1992). As a result of these two developments, researchers have come to regard schizophrenia as a brain disease, and social factors have been largely ignored as putative etiological agents.

It is increasingly clear, however, that the neurodevelopmental model, an essentially neurological concept, does not explain all the available data about schizophrenia. One consequence has been a revival during the 1990’s, particularly in Europe, of research into the role of social factors as causal agents in schizophrenia” (p.224).

Boydell et al (2004) pointed to the neurobiological effects of isolation rearing and social stress in animals. For example, rats raised in isolation demonstrated structural and physiological differences from controls in the hippocampi. Isolation raised rats demonstrate anxiety, learning deficits (analogue of working memory, hypofrontality, etc.?), sensory changes, dopaminergic dysfunction, etc (see the excellent research of Myron Hofer on the psychobiology of developmental loss and separation). In terms of human development, social relationship experiences may alter prefrontal neural systems which mediate emotional self-regulation (Lyons et al 2002). The early social environment impacts on various levels of psychobiological and neurobiological development. The early social environment has been demonstrated to induce synaptic changes that may be indicative of, and perhaps the cause of, alterations in behavioral and cognitive functioning (Ovtscharoff and Braun 2001). There is evidence that the early social environment can mediate the establishment of neural networks that regulate a child’s response to stress and emotional self-control (DiPietro 2000).

Boydell et al (2004) have identified the following broad categories in which social factors have been implicated in the initiation and course of the schizophrenias: family factors (mother-child relationship, unwantedness, family communication deviance, dysfunctional family environment, communal upbringing, early parental loss, expressed emotion, childhood abuse, etc.); an urban effect (city birth, city upbringing, etc.); social isolation (during childhood, moving schools in adolescence, in young adult life, at time of onset, migration and ethnic minority status, discrimination, unemployment, etc.); life events (socioeconomic factors, deprivation, inequality, etc.); interaction between social and other etiological factors (gene-environment interaction, social factors and cognitive processing, social causation versus social selection, etc.). I shall summarize the main research findings in each category.

In addition, because of my emphasis on the role of severe anxiety, what Marvin Hurvich and other psychoanalysts might call annihilation or disintegration anxiety (psychotic anxiety in the PostKleinian literature), and the significant role of developmental and social experience in shaping
not only the psyche, but also neuroplasticity in the CNS as well, I see a strong role for the dynamic psychotherapies, as well as more sophisticated CBT interventions as are being formulated primarily in the UK by psychologists and psychiatrists working with individuals diagnosed with schizophrenia and bipolar disorder.

Contemporary Psychoanalytic Approaches

Franco De Masi (2006), PostKleinian psychoanalyst, in his recently published paper “Psychotic withdrawal and the overthrow of psychic reality,” distinguishes between the realm of imagination and phantasy from the psychotic withdrawal into fantasy. De Masi does not see delusions as a lie which refers to something else, rather, it is placed beyond unconscious and conscious falsification, altering the person’s sense of personal identity. this view of delusion as defensively distorting identity is opposed to the view, one that I espouse, that the delusion and hallucination are not symbolic substitutes for identity, rather they hide an absence, a sense of personal nonexistence. In this, I am in full agreement with psychiatrist-psychoanalyst Gaetano Benedetti.

Benedetti (1992) noted the schizophrenic patient’s difficulty in distinguishing self from non-self. The schizophrenic person lives in the unbearable paradox of needing to differentiate oneself from the colonizing influence of others in the merger experience, yet, to separate would mean loss of the self. The loss of one’s own identity is always the basic danger. The abiding presence of severe annihilation and psychic-somatic death anxiety attests to this conundrum. Benedetti wisely notes that the patient’s nascent self exists in the projections set before us, i.e., the hallucinations and delusions. In regard to the latter, Benedetti concluded:

“This negative kind of semiotics may be understood by us in the following way: the alienated Self, no longer having an unconscious image of its own identity, looks about in the surrounding world no longer for an image of the internal image-in other words a symbol-but for a substitute for it. This Self searches for something which refers continuously to itself, but does not lead back to itself because, sensorially speaking, it substitutes an absence. Without this external, hallucinatory substitute, the patient could not perceive himself; hence his resistance to abandoning it in a psychoanalysis which proposes to reduce it for him to a concept of Self. So our task is to look for the lost Self in the sensorial images which it sets before us, not by interpreting these images for him, but by enriching them with our presence to the point where we give them the consistency of new, positive symbols” (p.7).

In the psychotherapy of persons with schizophrenia, Benedetti (1987) stated “...the patient learns to distinguish between object and self, to sense his surroundings, and to organize his fragmented ego functions by means of the therapist’s allowing himself to be used as a symbiotic object “ (p. 81). The role of interpretation in psychosis psychotherapy is different from the role of interpretation in the therapy of neurosis. Interpretations in the former address the structural needs of the person with schizophrenia: to help the patient discriminate self from non-self, to grasp the
boundaries of the self, to achieve an intrapsychic coherence. Resistance to interpretations in psychosis psychotherapy involves an attempt at survival by means of organizing a psychotic identity in the vacuum of non-existence. Interpretations could not fill the terrible vacuum within patients with schizophrenia. Benedetti believed that these interpretations “...are aimed at putting ourselves into the psychotic world of the patient, then this psychotic world must become valuable to us as a message of a human longing for personal existence” (p. 86).

De Masi criticizes the early psychoanalytic hypothesis of the conflictual nature of psychotic disturbance and its belonging to the dynamic unconscious, rather, he believes, “...attention now focuses on the disturbance that acts on the precursors of symbolic thought and on the psychic elements necessary for metabolizing emotional experiences” (p. 793). As previously noted, De Masi carefully distinguishes between the world of fantasy and imagination, which has to do with, according to Winnicott, the realm of play, from the world of withdrawal into fantasy, a withdrawal from psychic-emotional reality, mostly because it is too painful. In Bion’s terms it is a state of -K. De Masi proposes: “In this withdrawal, which begins in infancy, the patient becomes dissociated from the psychic reality and this lays the foundation for future delusional proliferation” (p. 794). Barbro Sandin, a successful Swedish psychoanalyst of persons with mental illness as demonstrated in a research study, also understands the key role of withdrawal in psychosis. She notes:

“To understand schizophrenia we must understand the schizophrenic or rather get to know each individual’s ‘private world.’ As for myself I see symptoms as a direct result of contact with the surrounding world being fractured and which makes interaction impossible thus forcing the individual to attempt emotional self sufficiency” (p. 13).

I must add here, that Freud saw the core of the illness of the narcissistic neuroses, what we partly call schizophrenia today, as a decathexis, a withdrawal of emotional and psychic investment, in external and internal object representations. Freud saw what we call the positive symptoms of schizophrenia, ie, hallucinations, delusions, as forms of self-cure, ie, restitutional symptoms.Ping-Nie Pao (1979?) thought that Freud’s viewpoint on psychosis was that the conflict between decathexis and recathexis never gets adequately resolved.

De Masi (2006) summarizes his position on psychosis as follows:

“My thought is that psychotic withdrawal is primitive and is established precociously in infancy, when the child ‘loses’ his mother. Indeed, withdrawal, in which the patient lives for long periods and which progressively deteriorates his contact with emotional and relational reality, cancels the experience and memory of the trauma. Withdrawal is the breeding ground in which the delusional experience comes into being, later destined to develop in all its grandiose and
persecutory sequences. Altering emotional reality, withdrawal not only distances the perception of the abandonment and the emotional absence of the parents, it also creates a state of pleasure. The catastrophic anxiety appears subsequently, when the pleasure of omnipotence has destroyed all possibilities of symbolic thinking” (p. 798).

Coming out of the delusional state, De Masi and many others point out, is extremely painful. To defend against this pain, the individual may attempt to re-establish psychotic functioning and withdrawal, a form of which John Steiner would refer to as a psychic retreat to a psychotic organization of mind. De Masi believes that clinical experience shows that a halt in psychic development not only creates a void that needs to be filled, but also psychopathological structures, akin to what Pao called the pathological reorganization of self, evidenced in such symptoms as a grandiose delusion, in order to defend against organismic panic and ensure continuity of the self.

In regard to psychoanalytic treatment, De Masi concludes:

“In other words, the psychotic patients become prisoners of the false identities they build and no longer maintain any consciousness of reality, which represents the only way for building a real identity. The analytic process can aid in restoring consciousness of reality and in creating those conditions for helping the patient to come out of the psychotic withdrawal...Conceptualizing the retreat as a conscious but unaware self-deception implies the possibility that analysts can reach patients in their psychotic withdrawal. This psychopathological construction, even if connected to the nature of the primary objects and to their relationship with the patient, develops precociously and autonomously and leads to dissociation from psychic reality. It is necessary that this process be recognized and its origins understood during analysis, so that the patient can escape its power.

Loss of the delusional identity leaves an anxious-making void. Coming out of the psychotic withdrawal and not being able to face psychic reality constitutes a catastrophic experience. Falling into the void and the painful sight of the self-deception he has lived creates a feeling of disorientation that a flight backwards into the psychotic world is a clear possibility. For this reason, analysts at work with the psychotic must keep alive and transmit, with measure and realism, to patients their hope that a potential path of healthy outcome is possible for them too” (pp. 804-805).

Gaetano Benedetti (1987) described psychosis psychotherapy in the following terms:

“...psychotherapy aims at the creation of a therapeutic integration of the patient, which does not work on the social level alone...but goes deep into the unconscious, so that within the patient an intrapsychic synthesis can be fostered through the mirror of what happens in the dual patient-therapist field

Such an integration is attempted by means of the capability of the therapeutic person to enter into the world of the [person with schizophrenia], using shared symbols of the patient, the
therapist’s creative fantasies, as well as ego-nourishing dynamic interpretations, all of which
stimulate from within the psychotic world the necessary psychosynthetic forces” (p.79).

Benedetti believed that individual psychotherapy of the person with schizophrenia begins
with the entrance of the psychotherapist into the actual situation and world of his partner. Dreams
of the therapist may arise and suggest her or his unconscious concerns with the patient. Certain
negative feelings of the patient are perceived by the therapist as her or his own. Mutual
identification between the partners is the ground for a dual reality to emerge. Autistic protosymbols
(Benedetti defines protosymbols as transitional phenomena on the way to becoming symbols)
become, through the therapeutic relationship, dualized symbols of insight and communication.
Benedetti (1987) noted:

“The counteridentification of the patient with his therapeutic [partner] by means of the
acceptance of the therapist’s interpretations appears to be possible only to the same degree that the
therapist...identifies with the introjected, fragmented experiences of his patient. In the
psychotherapy of schizophrenia, the patient learns to distinguish between object and self, to sense
his surroundings, and to organize his fragmented ego functions by means of the therapist’s
allowing himself to be used as a symbiotic object [and as Searles pointed out, the patient is a
symbiotic object for the therapist as well]” (p. 81).

Benedetti (1987) emphasized that the role of interpretation in the psychotherapy of
schizophrenia is different from its use in psychoanalysis. The schizophrenic patient is not just
shown the “psychodynamic linings of the clothes of his illness,” but is also confronted with his
potential image in ourselves and “the meaning his existence holds for our own.” Based on his over
50 years experience in the psychotherapeutic treatment of psychotic patients, Benedetti defined the
turning point in therapy to occur when “the loss has been compensated for, not only by full
participation in the patient’s situation but also by the introjection of this patient’s image, which
allows him, conversely, to introject the therapist as a love object, as the Ego’s ideal, thus stimulating
development of the Self” (p. 130. The loss Benedetti refers to is a loss causing a narcissistic gap
deriving from loss of the ideal Ego. Benedetti defined the latter as “a superegoic image of the self
needed by the Ego in order to unconsciously idealize itself, and thus fully accept itself” (p. 9).

Benedetti and Peciccia (1998) have identified pathological symbiosis (the
fusion transference with the world evident in such symptoms as referential
thinking and auditory hallucinations), splitting and autism as the basis
of the ego structure of the person with schizophrenia. These clinicians
have identified the psychotic structure to be the result of a lack of
integration of the separate and symbiotic selves (Peciccia & Benedetti,
1996). Splitting causes the ideal Ego to be perceived as an alien voice or
visual hallucination. With the narcissistic loss which brings about loss
and fragmentation of the nascent self, the ego no longer understands
itself, it is in shreds, resulting in an idealized, grandiose, omnipotent self, as a defense against
organismic panic and helplessness resulting in a pathological reorganization of self (Pao, 1979). In schizophrenia, the patient is both persecutor and persecuted. According to Benedetti (1990) because of splitting and the impaired ego structure of the schizophrenic patient, the psychoanalyst has a new task, unlike in the case of anaclitic depression in which the analyst must interpret the perverse relationship between the ego and ego-destructive superego (Bion’s term) and the conscious impotence and unconscious omnipotence. Instead, the psychoanalyst “must first of all provide the Ego with that amount of narcissism it needs to integrate and understand itself...Psychotherapy is, first and foremost, a positivization of the patient as a person” (p. 11). Benedetti (Benedetti & Peciccia, 1998) remarked: “The partial identification with the suffering of these patients encouraged me to dare seek out the places in our unconscious where human existence comes into contact with death” (p. 170). Benedetti also believed, and to this I can readily concur along with Searles (1979) and Herbert Rosenfeld (1987), that deeper contact with psychotic patients, the kind of emotional contact upon which they depend for psychic survival, stirs up the psychoanalysts’ own psychotic anxieties, but this loses power to be harmful because it is taken up into the “dialogic interweave” between patient and analyst and this duality becomes the symbol of the self and is therefore ‘anti-psychotic.’

Effects of Psychotherapy on the Brain

Brian Koehler PhD


The successful rehabilitation of affect/emotion as a crucial focus of investigation due to the experimental work of LeDoux and others on the neural pathways of fear and anxiety has increased the relevance of neuroscience to psychoanalysis.

Eric Kandel postulated that as learning has a measurable impact on the brain, so successful psychotherapy is also likely to lead to neural/synaptic changes.
Psychotherapy and the Brain

Neural plasticity has been demonstrated in the human brain in somatosensory systems, the motor cortex, higher cortical functions including language, as well as affective pathways.

Psychotherapy can be surmised to lead to better modulation of potentially indeletable neuronal response patterns at the level of the limbic system by higher cortical (heteromodal association) centers. Basic relational schemata and expectations are likely to be stored in implicit memory systems and changing the connections and characteristics of brain pathways underlying implicitly stored experiences associated with affect states and interpersonal relationships is likely to involve considerable amounts of time and effort. Phylogenetically old systems of emotional appraisal are connected to neocortical linguistic function, which may be a precursor for gaining access to those levels of emotional evaluation by verbal exchange.

The most frequently cited studies on changes of brain function following psychotherapy has been done by Baxter et al (1992) and repeated by the same group (Schwartz et al 1996). Severe OCD patients were compared on an SSRI (Prozac) or a CBT approach. PET scans were performed pre- and post-treatment (at a ten week interval). According to this group, OCD consists of a self-reinforcing loop between orbitofrontal cortex, caudate nucleus, and thalamus which is difficult to interrupt. Consistent with their theory, both treatments led to metabolic decreases in the head of the right caudate nucleus and orbitofrontal cortex.

A PET study by Brody et al (2001) with severely depressed patients showed normalization after 12 weeks of treatment of neural metabolic abnormalities in patients treated either with an SSRI (Paxil) or with interpersonal psychotherapy.

In another PET study, Furmark et al (2002) demonstrated significant reductions in activity in the amygdala, hippocampus and adjacent neural areas in anxious patients treated either with CBT or citalopram.


Beutel et al (2004) in their paper “Impact of psychodynamic psychotherapy on brain function: Pretreatment results from a controlled fMRI study,” demonstrated better neocortical control over limbic areas as a result of four week psychodynamic inpatient treatment of panic disordered patients.

A team of investigators at the Institute of Psychiatry in London (Wykes et al 2002) demonstrated that patients with schizophrenia who had received a psychological treatment, cognitive remediation therapy (CRT), had significantly increased brain activation in regions associated with working
memory, i.e., frontocortical areas

Saarinen et al (2005), in their paper “An outcome of psychodynamic psychotherapy: A case study of the change in serotonin transporter binding and the activation of the dream screen,” demonstrated normalization of serotonin transporter (SERT) binding at the midbrain level, as well as significant alleviation of depressive symptoms with psychodynamic psychotherapy in a female patient with major depressive disorder.

All of these studies used control patients.

Roffman et al (2005-“Neuroimaging and the functional neuroanatomy of psychotherapy” in Psychological Medicine, 35, 1385-1398) pointed out the difficulties, technical and logistical, in using traditional fMRI, PET and SPECT scans naturalistically within the setting of individual psychotherapy. However, these authors proposed the future development of such novel neuroimaging techniques as near-infrared spectroscopy (NIRS), which allows for the measurement of cortical cerebral blood flow (CBF) less invasively than fMRI and is also more portable and less expensive than the latter. NIRS is also safe and practical for repeated measures and has been employed to measure CBF in persons with a range of neuropsychiatric conditions (Strangman et al 2002). A second optical technique in development is two-photon microscopy. This tool can potentially image deeper brain activity in vivo even on a cellular level (Miller, 2003). In the past, psychophysiological measures have been used to allow for simultaneous measurements from both patient and therapist. Likewise, these new non-invasive optical techniques could also permit simultaneous measures of patient and therapist, and would fit well with a contemporary relational approach to the psychoanalytic setting and dyad.

Concluding Remarks

In summary, my model of the schizophrenias from a neuroscience perspective, privileges the role of profound and chronic stress/fear/anxiety, social defeat, separation and isolation in accounting for the neuronal alterations observed in these disorders; incorporates relational neurobiology, affective and social neuroscience; emphasizes the role of neuroplasticity, including stem cell proliferation in neurogenesis; the genetic focus is heavily weighted towards epigenetics and the environmental regulation of gene expression and transgenerational transmission of defensive responses to threat.

From a sociocultural perspective, this model studies high risk factors which are important not only in the course and outcome of the disorder, but in its initiation as well.

Psychoanalytically, this model underscores the importance of identity formation, subjectivity and intersubjectivity. The psychoanalyst attempts to simultaneously foster autonomy and relatedness while steering between the poles of intrusion and separation (shame) anxieties. Hate is
understood as a reaction to the power the object has for inducing separation and self-loss terror. Working through the latter towards a deeper capacity for mutual love is seen as mutative.

Neuroscience research can only take us so far in the understanding and care of persons with schizophrenia—it has its limitations and therefore, one must transition from a monolingual/bilingual approach to a trilingual approach—one that studies and integrates research findings from brain, mind and culture. Most importantly, I believe, one can never understand the group of illnesses which we have unfortunately called schizophrenia or bipolar disorder (personally, I think it would be better for both clinical and research purposes if we identify the actual symptomatology present and reported in the past, than give an overarching, static label which fails to capture not only the dynamic nature of the phenotype, but also the dynamic nature of the brain), unless one immerses oneself in a long-term relationship with the individual and uses that relationship to help the patient heal her or his permeability of self, internal/external confusion, abysmally low self-esteem and excessive shame and guilt, overwhelming sense of loneliness, intolerance of positive or negative affects arising from relatedness, past traumas, particularly relational ones, as well as the pathological organization of self reflective in feelings of grandiosity and omnipotence consequent to agonizing states of annihilation and disintegration anxieties, and reliance on such defenses as splitting, denial, and excessive projective identification.

Brian Koehler PhD
New York University
80 East 11th Street #339
New York NY 10003
212.533.5687
brian_koehler@psychoanalysis.net