

The schizophrenias as disorders of self consciousness

Sean Exner Baumann

Department of Psychiatry and Mental Health, University of Cape Town, Cape Town, South Africa

Abstract

There are limitations to the meaningfulness and usefulness of the diagnosis of schizophrenia. These limitations have important treatment implications. A re-evaluation of the phenomenology of the disorder, and in particular the formation of delusions, provides a potentially useful heuristic framework. A disturbance of the experience of the self, and of the self in relation to the external world, may underpin the phenomenology of schizophrenia. Putative biological substrates are described, and an integrative model is proposed, whereby higher centres, or mind, strive to modulate lower biological events, experienced as anomalous, in order to restore a meaningful homeostasis. These distorted representations form the characteristic symptoms of schizophrenia. Analogies are drawn with current strategies for managing chronic pain. Differences in the value accorded to the self across cultures, and the variations in outcome corresponding with these differences, are proposed as evidence and indicate a need for a paradigm shift in the philosophy of treatment of the disorder.

Keywords: Schizophrenia, Treatment, Delusions, Self consciousness, Culture

Received: 29.12.04

Accepted: 02.02.05

"The beast does but know, but the man knows that he knows." John Donne 1628

Introduction

The idea of schizophrenia poses a number of problems beginning with the meaning, usefulness, and limitations of the concept of the diagnosis itself. A diagnosis is generally assumed to explain a symptom or provide a causal explanation for a phenomenon. A diagnosis of schizophrenia may be reliable, objective, and categorical, following the conventions of a biomedical model, and conforming to a scientific rigour, and yet not explain the phenomena, nor address the issue of meaning which, it will be argued, is central to the concerns of those who suffer the symptoms of schizophrenia.

These difficulties are not confined to psychiatric diagnoses. The diagnosis of fibromyalgia does not explain chronic pain. Diagnosis in psychiatry is nevertheless perhaps more critically limited by not incorporating the subjective component. The neurosciences have clearly increased understanding of the pathophysiology of schizophrenia, yet there remains no adequate model integrating biology, psychology and social context, or brain, mind and behaviour.¹ The manifestations of schizophrenia are furthermore so various as to lead many commentators to question the usefulness or the validity of the concept itself.² Clearly individuals present

with different biological, psychological and social loading factors, which interact in complex and different ways. A tension also exists between mind and brain formulations: in recent years it has been argued that brainlessness in psychiatry has been superseded by mindlessness³, whereas the social dimension has been relatively neglected. This article is intended to formulate some ways in which these various components may be tentatively integrated.

The problem of diagnosis

Within the limits of a biomedical model there are levels of causation. Heart disease may be caused, for example, by coronary artery disease, or cardiomyopathy, diagnostic entities which require yet further levels of explanation. The concept of schizophrenia similarly requires levels of understanding that extend beyond the criteria of standard diagnostic systems. Delusions, hallucinations, various forms of thought disorder, social withdrawal, emotional restrictedness, a loss of volition, and an impairment of insight and judgement are central to the diagnosis and are incorporated into standard internationally accepted diagnostic criteria.^{4,5} Yet this characteristic cluster of symptoms does not lead closer to an understanding of the phenomena of schizophrenia, and a diagnosis based on these symptoms has been criticized as representing a premature foreclosure, and thus limiting the scope of treatment.⁶

Beyond these phenomena a pattern emerges. Delusions tend to be more specifically characterised by passivity phenomena, the experience of not being the author of ones' own actions. Hallucina-

Correspondence:

*Dr SE Baumann, Department of Psychiatry, Groote Schuur Hospital, Anzio Road, Observatory, 7925, Cape Town, South Africa.
email: seanexb@mweb.co.za*

tions are perceptions of events generated internally but experienced in external space. Thought disorders represent a failure of monitoring the meaningfulness or effectiveness of ones' utterances. Social withdrawal reflects a loss of a sense of self-efficacy, or having a social role, that often manifests in self neglect. Loss of volition is similarly an impairment of a sense of agency, coupled with the loss of the emotional drive to action. The absence of insight reflects an inability to recognize the self as disturbed. A common denominator of these apparently disparate phenomena is a disorder of self, or the relationship of the self to the outside world or external reality. A core tenet of the notion of self is the assumption of the self as being conscious, or reflexive, and of there being a fundamental distinction between inner and outer worlds. In this respect schizophrenia may therefore be regarded as a disorder of self consciousness or self awareness. The definitions of consciousness are varied and elusive, but are broadly thought to include a sense of subjectivity, of the self as integrated or unitary and continuous, and of intentionality and autonomy.⁷ It is the disruption of these faculties, which might be considered to be at the core of what it is to be human, that constitute the phenomenology of schizophrenia.

The problem of consciousness, autonomy and the self

The notion of consciousness itself poses a number of problems, one of which is that the irreducibly subjective element that is integral to consciousness renders it inaccessible to scientific investigation in the conventional sense. Nevertheless an evaluation of the subjective experience of schizophrenia is required to provide an adequate account of the psychotic experience. A phenomenological approach, although not amenable to measurement, is empirical and is founded on detailed non-inferential accounts of psychotic experiences.⁸ But therein lie further limitations, in that the study of the contents of consciousness does not reach into the enigma of subjective experience: the experience of psychosis and the inferences drawn from it, or the meanings made of it. This is not particular to encounters with psychotic patients but a feature of the human condition. It is not possible to know what it is like to be another. Nor is it appropriate to assume that blue sky observed by one is the same blue perceived by another. Although the neural basis may be identified, perceptions are constructs, integrating memories, emotions and consciousness to form intentionally meaningful representations of the world and the self in relation to the world.

Furthermore consciousness cannot be regarded as a unitary phenomenon. Levels of consciousness are mediated at different levels of the central nervous system.⁹ Disruption of the reticular activating system at the brainstem will result in coma or death. Consciousness of fundamental drives, for example hunger, is mediated at higher diencephalic levels. More complex forms of consciousness, tending to become more human faculties, for example the capacity for empathy, are mediated at still higher more evolved levels. A critical degree of synaptic complexity generates the capacity to free the mind from environmental contingencies, and creates the possibility of forming alternative representations of reality.¹⁰ Thus the self becomes differentiated from the world and develops the capacity to act intentionally upon it. It is this characteristically human faculty that seems to become disrupted in schizophrenia. Pathology at these higher neo-cortical levels and their subcortical connections seem most likely to form the biological substrate of schizophrenia. The problem may be conceptualized as a failure of integration.

The problem of consciousness is further compounded by a growing awareness or acknowledgement of its' fragmentary nature. There is to a degree a redundancy of consciousness: one is only conscious of a very small proportion of the information and the processes required to survive at the most basic level.¹¹

It has been argued that the notion of the self is in itself illusory, merely granting one the consolation of a fictional continuity, or history.¹² The concept of free will is similarly cast into doubt. The evidence on a neurological level is that thought or reflection does not necessarily precede action. Stimuli need to persist for approximately 500 milliseconds to reach conscious awareness.¹³ Motor responses may occur before the conscious intention to act. The notion of rational decisions governing the order of our lives thus seems increasingly untenable. A prevailing notion, particularly in the West, is a belief in progress, from Socrates through the Enlightenment to the rise of the sciences. Mankind is perceived as distinct or separate from the world and gaining mastery of the world through the application of reason and the acquisition of knowledge.¹⁴ Yet there seems to be an ambivalence in this modernist and triumphant vision of human society. As individuals strive to become themselves, by freeing themselves from perceived contingencies, they also seek to lose themselves. The widespread use and abuse of mind-altering drugs indicates a need to unburden oneself of consciousness. In the intimacy of sex one seeks dissolution of the otherness of oneself: in music, dance and ritual one reaches beyond the mundanities of the quotidian world, and religious belief and practices may be seen to reflect a yearning to transcend ones' embodied humanity and immerse oneself in a higher spiritual reality. The most concrete and human form of evidence is the phenomenon of suicide, wherein one seeks to lose oneself by destroying oneself. There appears to be ambivalence about being oneself. We do not seem to be entirely confident that the endowment of consciousness is unreservedly a blessing. This is not to argue for the essentially schizophrenic nature of human existence, but to reconsider certain dynamic and in particular Bleulerian formulations in the light of current neuroscientific knowledge.

From the psychological effects of certain drugs, experiments involving sensory deprivation, and the vulnerability of certain life stages such as adolescence, it may be inferred that the capacity for psychotic experience is not confined to disease states. From these observations it may be argued that the formation of symptoms represent more a matter of degree, of distress and disability, rather than being fundamentally discontinuous with the experience of a common humanity. This notion questions the disease model of a pathological otherness, and may be a way of restoring some humanity to the concept of schizophrenia.

One may speculate about the meaning of this conflict in relation to the self, of autonomy and self-abnegation, anxiety and depression. One possible dynamic may be unease about separation and loss: our fragmented incomplete consciousness has bestowed upon us a restless dissonance of being in the world and yet not being of the world, of being both subject and spectator. This may be seen as a loss of an unquestioning sensuous integration with the world, an unreflecting state of innocence that may be represented by the Eden of childhood. The biological birth of the child is followed by a psychological birth, with the attendant problems of loss and separation.¹⁵ Adolescence indicates the emergence of the adult self, and the struggle for autonomy. As such, and perhaps partly for the reasons described above, it also represents the high risk period for the emergence of schizophrenia.

Seeking meanings, losing oneself, or striving to transcend one-

self may therefore reflect to some degree an attempt to restore what has been lost, and to unburden oneself. This is not to argue that schizophrenia is a defence mechanism, a pathological equivalent of a creative process, or either an intentional or a subconscious relinquishing of the self. It is merely to suggest that what it means to be humanly conscious is uncertain, that whatever it might be that represents being conscious in the human sense is the very faculty that becomes disorganized in schizophrenia, and that the substrates of this process are likely to be the neuronal integrity and functional connectivity of the prefrontal, temporal and limbic cortices and their subcortical connections.

Causes and correlations

Evidence from a number of domains of enquiry, in particular neuroimaging and psychopharmacology, implicate a wide range of cortical and subcortical zones in the pathophysiology of schizophrenia. Most consistently reported areas include the prefrontal, temporal and limbic cortices, the hippocampal formation and the subcortical connections of these centres, in particular the ventral tegmentum of the midbrain.¹⁶

Some tentative links may be postulated between these anatomical zones and the phenomenology of schizophrenia. Damage to the prefrontal cortex, in particular the dorso-lateral areas, yields a characteristic cluster of symptoms including apathy, motor programming deficits, poor abstraction and categorization, and impairments of executive function.¹⁷ This latter function comprises the ability to formulate goals, to implement and adjust plans, and to reflect and make judgements through integrating internal and external stimuli, working memory and emotional drives. Clearly it is the impairment of these capacities that form the characteristic, particularly more negative features of schizophrenia, and that are reflected in functional imaging studies.¹⁸ Damage, in particular to the orbital frontal areas, leads to disinhibited, disorganized, impulsive behaviours that render the individual unable to act in a methodical, effective way to reach a given goal.

It may then be argued, that, as representing the most phylogenetically evolved areas of the human brain, these anatomical areas may also be considered to act as the neurological substrate of the self. Clinicians will be familiar with the observation of family and friends that a person suffering from schizophrenia is no longer "himself" or "herself", as Harlow reported Phineas Gage, following a traumatic injury to the frontal lobe of the brain in a road-building accident.¹⁹

Language is another particularly human capacity, with its substrate in the prefrontal cortex and association areas, and related to the functions of abstraction and categorization mentioned above. Various forms of thought disorder, manifest in language disorganization, are characteristic of schizophrenia, and are regarded by some as central to the concept.²⁰

With regard to the possible associations of particular clinical features and anatomical substrates, the temporal lobes are associated with perceptual abnormalities, the hippocampus with memory formation, and the limbic system with emotional drives. The parietal lobes mediate the experience of the self in relation to external space, and in this regard the phenomenon of anosognosia may be considered to be a neurological equivalent or analogy of impaired insight. Clearly it becomes simplistic and reductionist to compartmentalize higher cortical functions in this manner, but the argument is merely an attempt to formulate schizophrenia as a disruption of the integration of these component functions, and to consider a disorder of neuronal connectivity as the substrate of this

disruption.

The notion of self seems to arise out of the evolutionary development of connections between relatively independent circuits or modules²¹, and it is possibly the derangements of these interconnections that form the biological and experiential basis of schizophrenia. Clearly the more complex and evolved a system becomes, the more liable it is to disorganization, or fault, and evidently these faults may develop through a variety of mechanisms. It is this disruption, or splitting of functions, that led to the coining of the term schizophrenia in the early part of the twentieth century.

Conceptually it is possible to imagine that these processes that lead to a disorder of the sense of self, and the sense of the self in relation to the world, render the self void or ineffectual. Perhaps understandably, the world then becomes perceived as either meaningless or menacing.

Some of the difficulties possibly arise from a confusion of levels of description. In the terms of this argument the deep neurobiological level is represented by a disordered connectivity. On the neuropsychological level this is represented as incoherence or noise, yielding the phenomenology of, for example, delusions. Beyond the phenomena the subjective level is represented by qualia, the possibly unknowable elements of conscious experience.

The apparently human need for order, predictability and meaning, alluded to above, confers survival value, and is embedded in the modulatory nervous, endocrine and immunological systems. The breakdown of these systems, in states of psychosis, conceivably leads to a breakdown of pattern, or self. A possibly useful analogy for this phenomenon may be the experience of noise, the loss of tonality and harmony, and thence of meaning. From this it can be imagined that the person, having lost all sense of a meaningful or autonomous self, becomes engulfed by the outside world. This experience is reflected in the passivity phenomena of schizophrenia, or withdrawal into the profound yet vacant state of an intolerable autism. These terms refer back to the work of Eugene Bleuler, referred to earlier, as does the notion of interpreting Schneiderian first rank symptoms as accessory. Confronted with a meaningless void, a world encountered as sheer noise, the person with schizophrenia strives to make sense of the experience, and to restore order and meaning. This fundamental drive may be represented biologically in the limbic and deeper diencephalic circuitry.²² The sense of loss of the integrity and continuity of the self is interpreted as, for example, possession by an evil spirit, or control by a computer chip implanted in the brain. These explanatory metaphors are derived from social, cultural or spiritual beliefs or conventions, and require input from the hippocampus for the recruitment of these memories, and the involvement of the neocortex to construct meaningful idioms. The psychotic symptoms are of course not experienced as metaphors or idioms, as, it has been argued, disordered connectivity at the level of the dorsolateral neocortex impairs the capacity for the necessary abstraction to experience symptoms in this way.

Nevertheless clinicians will be familiar with the shift, with gradual recovery, from the statement, "I know it sounds crazy but it's true" to the less immersed, more reflective, "I felt as if..." It is not inconceivable that in the foreseeable future functional neuroimaging will be able to reflect these relatively subtle linguistic shifts.

The phenomenology of dreaming may provide a useful analogy. Bursts of dopaminergic activity, predominantly in the R.E.M. phase, in the meso-limbic and mesocortical pathways, are postulated to underpin the neurophysiology of dreams.²³ In this respect

the phenomena of dreams may be interpreted as the struggle of the obtunded neocortex, recruiting information from other sources to account for the at times vivid imagery and the intense emotional quality of dreams, to give form and some partial coherence to shifts in neuronal discharges at the tegmental level. Becoming alert, these dreams become less disjointed, and possibly more amenable to meaningful interpretation. In schizophrenic states the fundamental seeking drives at the limbic and lower diencephalic levels, formed into socially adaptive forms at the neocortical level, appear to become disorganized. A core feature of schizophrenia has been described as a delusional atmosphere²⁴, an oneiroid state, an intolerable experience of unease and disquiet prior to coalescence into relatively more coherent delusions.

This formulation extends beyond a Jaspersian distinction of primary and understandable delusions and secondary delusions, proposing that the very nature of delusions represent a secondary, or an attempted homeostatic process in response to disorganized, more caudal neurological events.

Mindful of the accusations of mindlessness in the current, predominantly neurobiological formulations of schizophrenia, and of the growing concern regarding outcome measures, including quality of life, the subjective element requires consideration, and this includes the experience of being in a state of schizophrenia. A basic tenet of our human consciousness is a notion of privacy, of inhabiting our own worlds, and of an assumption of internal and external worlds, or realities, the latter less knowable than the former, more vivid subjective reality.²⁵ It is difficult, and perhaps impossible, to imagine the breakdown of this fundamental distinction, the loss of a fundamental sense of privacy, of integrity, and the eruption within of an external world over which one has no control, and which therefore is perceived as threatening and for many unbearable. Intentionality is eroded, the subject becomes an object, and any sense of meaning, granting purpose in life, is destroyed. Thus suicide becomes an ever-attendant risk.

The relative neglect of the social dimension of schizophrenia has been mentioned earlier. In the terms of this argument the self emerges initially in separation from the mother, and thereafter in relation to others in what has been described as a continuous process of mirroring.²⁶ It is perhaps insufficiently acknowledged that a defining factor of one of the core phenomena of psychosis represents a social criterion. A delusion is defined as such if, in addition to the other defining criteria, it cannot be considered to be consistent with the subjects' social and cultural context. Schizophrenia is defined according to social criteria. Furthermore social factors have an important bearing on outcome. The concept of high expressed emotion, and lack of social support, for example, has been consistently reported to be associated with a poor prognosis.²⁷ As has been discussed, a fundamental aspect of human consciousness is consciousness of the self, and that self is defined in relation to others. In this respect it is understandable that overinvolvement, a component of the notion of high expressed emotion, can become perceived as a threat to the fragile sense of the self in schizophrenic states. Furthermore the significance, or the valence attached to the notion of the self varies across cultures and religions, and it will be argued that this variation itself may have a significant impact on the course and prognosis of schizophrenia.

Consequences

It might be argued that these issues are merely of theoretical interest, but it is the thesis of this article that the implications do have an important bearing on the management of schizophrenia.

The problem of chronic pain provides a possibly informative model for re-evaluating some of the basic assumptions underlying current philosophies of treatment. In fairly recent years a paradigm shift has occurred in the treatment of chronic non-malignant pain. This may be articulated as a shift in the goals of treatment from the elimination of pain to developing strategies of living with pain. It represents a change of direction from the notion of cure, in terms of a relatively restrictive biomedical model, to the principles of rehabilitation according to broader more systemic biopsychosocial approaches.²⁸ This shift in thinking is borne out of a realistic appraisal of the limits of biomedical principles of treatment in a high proportion of chronic illnesses. The assumption is that the presenting symptoms are symptoms of underlying causes, and that by the identification and treatment of these underlying causes the symptoms can reasonably be expected to remit. Chronic pain is more appropriately conceptualized as a problem in itself, and as such the proper focus of attention, taking into account the probability that the contributing and perpetuating factors are in all likelihood multi factorial.

It has been argued that the symptoms of schizophrenia are inadequately interpreted as mere symptoms of an as yet incompletely understood pathological process. The alternative formulation is that these phenomena represent a struggle to give form to formless biological events and to construct meanings in the attempt to live with an anomalous set of experiences that might otherwise be intolerable.²⁹

"When I'm ill the machine switches on...when you are well you've got control...you bring it on yourself." E.R.

"Eventually I align myself...balance out...get my privacy." M.R.

"So I need to keep moving...in order to have continuity...causing a feeling of calm" N.M.

These utterances by people living with schizophrenia represent endeavours to restore control, balance, continuity: the patient is less the patient than an agent actively engaged in seeking recovery.

The very processes that are implicated in the pathogenesis of the illness are recruited to develop alternative, restorative representations. In this respect the paradigm shift in respect of an appropriate response is the need for this process to be acknowledged and supported, in terms of the goals of rehabilitation, and not merely eliminated. To pursue the musical analogy, the aim of treatment then becomes the modulation of discordance, a restoration of harmonies, rather than the imposition of silence.

Clinicians will be familiar with the ambivalence shown by patients with regard particularly to pharmacological treatments, and which may be an insufficiently acknowledged factor in the high rates of non-adherence to treatment observed in schizophrenia. As with the barbarians at the gates, delusions may offer some sort of solution. A void, created through the successful suppression of symptoms, does not necessarily seem to represent a viable alternative.

Despite a remarkably similar incidence across the world variations in the outcome of schizophrenia have been consistently reported.³⁰ Of particular relevance is the counter-intuitive observation that schizophrenia has an improved prognosis in developing countries.³¹ The explanations for this phenomenon are no doubt complex and multifactorial, but may provide some evidence for the preceding rather speculative observations.

It has been proposed that schizophrenic states may represent disorders of the consciousness of the self, that this is a particularly human predicament, and that the phenomenology of schizophrenia, in particular the formation of delusions, indicate meaningful representations that reflect a restorative process. The notion of self is itself fluid, and varies across ethnic groups, cultures and religions. If a disorder of the self is central to the concept of schizophrenia, it may be argued that in social systems where a particularly high value is invested in the notion of the self the course of the illness may be fraught with greater complications than in groupings where a greater value is attached to communities relative to individuals.³² In this respect it may then be predicted that schizophrenia would have a worse prognosis in more individualist, materialist, free-enterprise socio-economic systems than in the more communalist societies characteristic of many developing nations. Furthermore unskilled labour, for example caring for children while breadwinners are at work, is accorded a dignity in developing communities, as opposed to the degradation of unemployment in more formal economies. These differences are reflected within South Africa, where variations in outcome are observed in different ethnic and cultural groups, and where, it is argued, the spirit of ubuntu may attenuate the psychotic experience and facilitate the processes of rehabilitation.

An associated line of evidence may be drawn from the impact on the course of schizophrenia of different interpretations of the phenomena across cultures, including the culture of the scientific method. Standard, Western psychiatric practice requires the identification by an objective observer of a specific cluster of operationally defined signs and symptoms for a diagnosis to be made. No meaning is attached to the symptoms, and treatment is aimed at the elimination of the symptoms. In this respect the patients' experience is essentially irrelevant and treated as anomalous or invalid. This contrasts with other belief systems or cultures where psychotic symptoms are invested with social meanings and ordained by tradition. Hearing voices becomes listening to ancestors, for example, and in this way is transformed from a pathological event to more validating integrative experience.

The status of the self in relation to the community, and the socially constructed provision of meaning to psychotic experiences may be significant factors in the variations in outcome in schizophrenic illnesses. These observations would then have a possibly important bearing on the philosophy and practice of the treatment of schizophrenia.

References

1. Kandel E. A new intellectual framework for psychiatry. *Am J Psychiatry* 1998;155:4 457- 468.
2. Crow TJ. Should schizophrenia as a disease entity concept survive into the third millenium? In Sartorius N. Ed. *Schizophrenia. WPA Series Evidence and Experience in Psychiatry*. John Wiley 1999: 40-42.
3. Eisenberg L. Psychiatry and neuroscience at the end of the century. *Forum: Psychiatry and the Neurosciences. Curr Opin Psychiatry* 1999; 12: 629 - 632.
4. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders. 4th Edition*. Washington D.C: American Psychiatric Association, 1994.
5. World Health Organization. *The ICD-10 Classification of Mental and Behavioural Disorders: Clinical Descriptions and Diagnostic Guidelines*. Geneva: World Health Organization, 1992.
6. Roberts G. The origins of delusions. *Br J Psychiatry* 1992;161:298.
7. Schwartz JH. Consciousness and the neurobiology of the twenty first century. In Kandel ER, Schwartz JH, Jessell TM Eds. *Principles of Neural Science. 4th Edition*. Mc Graw-Hill, 2000: 1317.
8. Sims A. *Fundamental concepts of descriptive psychopathology In Symptoms in the Mind. An introduction to Descriptive Psychopathology. 2nd Edition*. W.B Saunders, 1995: 3.
9. Bilder R. Schizophrenia as a neurodevelopmental disorder. *Curr Opin Psychiatry* 2001; 14:9-15.
10. Weinberger D. Schizophrenia. From neuropathology to neurodevelopment. *Lancet* 1995; 346(8973): 477-481.
11. Spence SA, Hunter MD, Harpin G. Neuroscience and the will. *Curr Opin Psychiatry* 2002;15:519-526.
12. Dennett DC. *Darwins' dangerous idea. Evolution and the meaning of life*. Penguin, 1995.
13. Libet B. How does conscious experience arise? The neural time factor. *Brain Res Bull* 1999;50: 339-340.
14. Gray J. *Straw dogs. Thoughts on humans and other animals*. Granta, 2002;153.
15. Mahler M, Bergman A. *Pine. The Psychological Birth of the Human Infant. New York: Basic, 1975*.
16. Buchanan R, Buckley P, Tamminga C, Schultz C. Schizophrenia research: A Biennium of progress. *Proceedings from the Sixth International Congress on Schizophrenia Research. Schizophr Bull* 1998; Vol.24.No.4. 501-516.
17. Grafman J, Litman I. Importance of deficits in executive functions. *Lancet* 1999; 354(9194): 1921-1923.
18. Liddle P F. Functional brain imaging in schizophrenia. In Reveley MA, Deakin JFW. Eds. *The Psychopharmacology of Schizophrenia*. Oxford: OUP, 2000: 109 -130.
19. Walsh K. *Neuropsychology. A Clinical Approach*. Melbourne: Churchill Livingstone., 1987:126.
20. Crow TJ. Nuclear schizophrenic symptoms as a window on the relationship between thought and speech. *Br J Psychiatry* 1998; 173:103-109.
21. Damasio A. *Looking for Spinoza. Joy, Sorrow and the Feeling Brain*. Heineman, 2003; 204.
22. Panksepp J. *Affective Neuroscience. The foundations of human and animal emotions*. Oxford: OUP, 1998;162.
23. Solms M, LeChevalier B. Dreaming and REM sleep are controlled by different mechanisms. *Behaviour Brain Sci* 2000; 23(6) 843-850.
24. Sims A. *Symptoms in the Mind. An Introduction to descriptive psychopathology*. W.B.Saunders, 1995;109.
25. Edelman G, Tononi G. *Consciousness. How Matter Becomes Imagination*. Penguin, 2000;23.
26. Whitehead C. Social mirrors and shared experiential worlds. *J Conscious Stud* .2001;8(4):5-35.
27. Vaughan C E, Leff J P. The influence of family and social factors on the course of psychiatric illness. *Br J Psychiatry* 1976; 129: 125-137.
28. Tyrer S P. Assessment measures. In: Tyrer SP Ed. *Psychology, Psychiatry and Chronic Pain*. Butterworth-Heinemann, 1992: 81-94.
29. Kapur S. Psychosis as a state of aberrant salience: a framework linking biology, phenomenology, and pharmacology in schizophrenia. *Am J Psychiatry* 2003;160(1):13-19.
30. World Health Organization. *The International Pilot Study of Schizophrenia. Vol.1..Schizophrenia. An International Follow up Study*. Chichester: John Wiley, 1979.
31. Jablensky A, Sartorius N, Ernberg G, et al. Schizophrenia: manifestations, incidence and course in different cultures. A World Health Organization ten-country study. *Psychological Medicine. Monograph Supplement 20*. Cambridge University Press, 1992.
32. Shutte A. Community and individual freedom, and conceptions of humanity. In Schutte A. Ed. *Philosophy for Africa*. Cape Town: UCT Press, 1993.