

Book Report and Analysis

Getting to the Heart of Schizophrenia And Learning What Makes Us Human

Bill Wilkerson continues his reports on complex topics in mental health and mental illness. Here, he reports on the book, “Mind, Brain and Schizophrenia” by Dr. Peter Williamson who holds the Tanna Schulich Chair in Neuroscience and Mental Health at the Schulich School of Medicine at the University of Western Ontario in London, Ontario, Canada, site of the famed Robarts Research Institute.

***By Bill Wilkerson
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For working parents, the mental health of their children must become a subject they have some grasp of – a concern demanding vigilance. Schizophrenia is an illness which embodies the complexities and torment of mental illnesses affecting the whole family.

How and why does schizophrenia happen? The search for answers goes on – with encouraging progress. This report chronicles the efforts of one determined scientist in Canada.

In his new book “*Mind, Brain and Schizophrenia*” published by Oxford University Press, Dr. Peter Williamson likens the quest to map the pathway to schizophrenia to mapping the circulatory system as a means to explain heart attack.

Dr. Williamson discusses intriguing clues pointing to dysfunction in specific brain regions as the cause of “voices” that those living with schizophrenia hear.

Recent evidence of “progressive enlargement of brain ventricles and loss of grey matter re-ignite ideas about neural degeneration in the development and onset of schizophrenia.”

Dr. Williamson says psychiatry finds itself “at the same crossroads medicine was at 400 years ago” when William Harvey was about to discover the circulatory system.

“Any number of genetic abnormalities can affect the heart but no matter the cause, the characteristic symptoms result, and with schizophrenia, these are not (pain) and shortness of breath, but flattened affect, hallucinations, delusions and thought disorder.”

“Like heart failure, schizophrenia probably has a number of causes that are unlikely to (appear) in any one patient and (400 years later) we do not understand all the causes of heart failure.”

He says “it is time to set aside the search for the causes of schizophrenia and focus on the final common pathway” where all factors converge. With brain image technology, far more information is being obtained about brain structure and function.

Rescuing future generations from the grip of this illness demands new knowledge about the changing nature of the brain.

“Brain development does not stop at birth (but proceeds) into adolescence and early adulthood,” Dr. Williamson says. “Essentially the brain is organized to filter and unify sensory information, produce coherent behavior and ensure survival.”

The prefrontal cortex is the region most important to complex human behavior and “damage either to the right or left prefrontal cortex can lead to deficits in a person’s ability to understand or predict the behaviors of others.”

“A perennial problem in brain research is explaining how such a complex collection of sights, sounds, smells and physical sensations is integrated into a unitary experience – the subjective and objective sense of self in an external, ever-changing world.”

This is called “the binding problem” and symptoms of schizophrenia seem to involve deficits in the process of creating this “unitary experience.”

Dr. Williamson says many schizophrenic patients complain that their thoughts and feelings are controlled by an outside force and they suffer from internal voices tormenting them with comments and commands.

Dysfunctions in specific brain regions governing affect, speech and self-attribution of thoughts and feelings could account for this.

Studies have found that an overwhelming majority of the 4,000 individuals living with schizophrenia had fingerprint abnormalities which have also been documented among those suffering Down Syndrome.

The design of fingerprints, generally controlled by genetic design, can be altered by utero viral infections in the first six months of pregnancy. There is consensus that (children) exposed to obstetric complications are twice as likely to develop schizophrenia.

The early signs of schizophrenia can appear among children in the form of a variety of intellectual and social deficits. School grades may drop between ages of 13 and 16.

Post-mortems among people who lived with schizophrenia show that the brains of some had atrophied, neurons were fewer and smaller and certain brain cells were in disarray. Other investigations have found abnormalities in brain connections.

Those who live with schizophrenia seem more likely to be born in winter. Genetic factors are the strongest influence of all, driving the risks of schizophrenia from one to 10 per cent of the population and, among identical twins, 50 per cent.

Dr. Williamson says that “probably the most hopeful sign in the treatment of schizophrenia is that we are now starting to think about ways of preventing deterioration in patients, not just providing acute treatment of their symptoms.”

He says many drugs already have that potential but long-term studies are required to demonstrate the benefits and “this research is not something that the drug companies are eager to do but it is essential if we hope to change the course of this disorder.”

In searching for the final common pathway of the disorder we know as schizophrenia, Dr. Williamson says that no one has yet come close to explaining schizophrenia like the circulatory system explains heart failure. Yet certain principles are emerging.

For example, Dr. Williamson says there is evidence of brain degeneration and dysregulation governing the release of dopamine in the brain around adolescence.

“Whether there are further degenerative changes after the onset of the illness is debatable, but certainly there is ample evidence that the loss of gray matter proceeds for several years in many patients.”

Dr. Williamson says that historically, scientists may have been looking at the problem from the wrong perspective and, returning to the analogy of heart failure, he says:

“We know that the heart is there to pump blood to the body. What is the equivalent relationship in schizophrenia? Obviously, the brain is not pumping blood but it is processing information (by sending) signals in complex networks of neurons.”

The brain connects disparate pieces of information into a coherent whole. People can then respond appropriately to what’s happening around them. But “in schizophrenia, something is going wrong in this process.”

Dr. Williamson says “finding the pathway to this destructive disorder may mean discovering how the brain streams and binds information – blending data from all five senses across time.”

“Like heart failure, schizophrenia may well have a final, common pathway and all indicators point to brain structures that stream and bind information.”

Dr. Williamson believes that science may come to understand how all this happens in this generation and, he notes, “in the course of our investigations, we may learn as much about what makes us human as we learn about schizophrenia.”