

## Neurodiversity

### *A Neurodiversity Theme Article*

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#### ABSTRACT

The neurological and psychological traits that regulate our thought and behavior fall along a spectrum that extends from the normal to the pathological, from traits that enable us to perform mental and physical functions to traits that interfere with these functions. Yet many people have a constellation of both normal and pathological mental traits. Some even have traits associated with exceptional intellectual or artistic ability despite being diagnosed as having a neurological or psychiatric disorder. These cases raise medical, ethical and legal questions about which conditions should be diagnosed as mental disorders or pathologies, and whether it is always in one's best interests to be treated for these conditions.

#### Introduction:

In the American Journal of Psychiatry, an advertisement for the selective serotonin reuptake inhibitor (SSRI) sertraline (Zoloft) shows a young woman wearing a hat whose rim covers her eyes. The caption reads: "Is she just shy? Or is it Social Anxiety Disorder?" The suggestion is that our cognitive and affective traits fall along a neuropsychiatric spectrum that extends from normal to pathological. Traits falling at the pathological end of the spectrum are often manifestations of an underlying neurobiological dysfunction that is diagnosed as a psychiatric or neurological disorder. Treatment for these conditions is indicated when it can restore patients to normal mental and physical functioning. In psychiatry, this may include interventions such as cognitive-behavioral therapy (CBT), psychopharmacology or a combination of these treatment modalities (Bloch, Chodoff and Green, 1999). Severe cases may be treated with electrical stimulation of the affected brain regions. In neurology, therapeutic interventions include pharmacology, surgery or deep-brain electrical stimulation.

In some cases, however, cognitive and affective traits may fall slightly outside the broad middle region of the spectrum, where the constellation of one's psychological properties is neither clearly normal nor pathological. Moreover, there may be considerable variation among people with the same generic neuropsychiatric disorder. Individuals with severe depression who experience psychosis and suicidal ideation fall at the pathological end of the spectrum. In contrast, individuals with a mild form of depression such as dysthymia may experience only a feeling of melancholy and fall just outside the middle of the spectrum.

Some neuropsychiatric conditions have both pathological and salutary characteristics. An individual with such a condition may display poor social skills and impairment in such cognitive functions as planning, inferential reasoning and decision-making. At the same time, this same individual may display exceptional mathematical ability or artistic creativity (Fitzgerald, 2003; Frith and Hill, 2003). This ability or creativity might include insight into problems or dimensions of the natural world not ordinarily open to the general population. Autism spectrum disorders are perhaps the best example of a neuropsychiatric condition that may involve both mental ability and mental disability, especially in the moderate form of the disorder--Asperger's syndrome (DSM-IV-TR, 200, 75 ff.). For those who have this combination of mental traits, exceptional mathematical or artistic talent are recognized and valued as natural gifts. Yet these gifts cannot be separated from what others would describe as cognitive and affective disabilities that are also associated with the condition. Mental ability and disability are inseparable components of a set of psychological properties that make these people the unique individuals they are.

These are examples of "neurodiversity," which recognizes that many people have a combination of neurological and psychological abilities and disabilities (Baker, 2006). This mix is generated and sustained by the different ways in which their brains are wired. It celebrates differences in the unique cognitive and affective capacities of people who fall along different stages of the neuropsychiatric spectrum. This phenomenon forces us to ask what counts as a mental disorder, and whether certain mental traits that deviate from those of the general population should be characterized as differences rather than disabilities. It also forces us to consider

the extent to which pathological traits can be balanced by salutary traits, and whether and on what grounds individuals with a combination of these traits should be treated. But how do we decide whether a person's general set of mental traits is normal or abnormal and thus indicative of an illness or pathology? What is the link between a brain disorder and outstanding mental attributes? Would it be in the best interests of an individual with such a disorder to intervene with CBT, psychopharmacology or other therapy? Or would their interests be better served by leaving the condition and its symptoms untreated? Could any gain from the restoration of some mental attributes outweigh or compensate for the loss of other mental attributes as a result of these interventions?

To respond to these questions, I will present cases of different individuals with distinct conditions and traits falling at different points along the neuropsychiatric spectrum. These cases will test our intuitions about what constitutes normal or pathological thought and behavior, and whether it is appropriate to always intervene with treatment for these conditions.

## A Spectrum of Mental Traits

Very generally, normal mental functioning consists in the cognitive and affective ability to interact with other people and to perform a range of ordinary cognitive tasks of daily life. These abilities fall in a broad middle range of the neuropsychiatric spectrum. Different people may possess these abilities to varying degrees. But the idea of a broad middle range of mental traits is an intuitively acceptable measure that can be used as a basis on which to classify conditions as illnesses or pathologies. This measure may also indicate which conditions warrant therapeutic intervention.

Consider autism spectrum disorders (ASD). Individuals with these disorders often have difficulty commuting and interacting with others in social contexts. Some also have cognitive impairment in concept formation and inferential reasoning. They can focus on the details of parts but not on the general patterns of wholes. Although autism is characterized as a psychopathology, the ability to see parts of details normally denied to conscious awareness could explain some forms of genius. Autism spectrum disorders fall along a neuropsychiatric spectrum that may include severe mental impairment at one end and creative genius at the other.

Although the neural mechanisms of autism are still not completely understood, the inability of many autistic individuals to interact socially with other people or to draw inferences from parts to wholes appears to be traceable to abnormalities in pathways between the limbic area of the brain and the prefrontal cortex. Post mortem studies of the brain of individuals who had autism have shown a decreased number of neurons in limbic regions such as the amygdala and hippocampus, as well as in the anterior cingulate (Volkmar and Pauls, 2003). Like schizophrenia, autism involves abnormalities in dopaminergic and serotonergic systems and probably arises from mutations in multiple genes. Autism may also involve dysfunctional mirror neuron systems. These systems are distributed through the insula and other brain regions. Mirror neurons regulate the ability to understand others' intentions and to grasp the social meaning of their behavior. This occurs through direct simulation rather than cognition (Rizzolatti and Craighero,

2004). While it is not known whether there is a direct causal link between these brain abnormalities and any outstanding mental attributes in ASD, there does appear to be a correlation between the two. Autism spectrum and certain other neuropsychiatric disorders usually develop from birth or very early in life. In this regard, the mental traits that characterize the condition are an essential part of the identities of those who have it.

Indeed, many people with ASD would insist that their mental traits make them a distinctive culture, a culture to which they are proud to belong and which they would not want to change in any respect. Individuals with traits falling at or near the extreme end of the autistic spectrum do not respond well to CBT or pharmacotherapy. In mild to moderate forms of these disorders, even if some traits considered borderline pathological could be treated, one would have to consider the consequences of the treatment if it eliminated the source of considerable mental ability and one's identity. At the same time, this would have to be weighed against the fact that children with moderate ASD may face problems as they approach adolescence, when social interactions become more complicated.

It is believed that the Indian mathematician Srinivasa Ramanujan (1887-1920) and the Austrian philosopher Ludwig Wittgenstein (1889-1951) had some form of Asperger's (Stewart, 1991; Monk, 1990). Ramanujan's work has profoundly influenced number theory in mathematics. Wittgenstein arguably has had an even greater influence on the philosophy of language and the philosophy of mind. If their exceptional ability was inseparable from cognitive and affective traits symptomatic of a mental disorder, then we should consider the possible loss of mathematical or philosophical genius as a consequence of any treatment that might have been given to them for the suspected syndrome. Individuals with ASD who are intellectually gifted may not be as rare as one might think. It is estimated that the incidence of savant ability in children with autism may be as high as 10 percent. In the United States, autism spectrum disorders may affect as many as two to six per 1,000 children.

If an abnormal mental trait or set of traits is offset by a mental trait indicative of exceptional cognitive ability in the same individual, then one can question whether the individual's collective set of mental traits warrants the label of "syndrome" or "disorder." At the very least, these considerations suggest that any label of "disease," "disorder," or "syndrome" should be given in qualified form. They also suggest that "normal" should be construed more broadly to include traits distributed over a fairly large area of the neuropsychiatric spectrum. Some might argue that it is preferable to trace these mixed sets of mental traits to their biological basis and give them a medical diagnosis. Presumably, this would avoid the social stigma and moral diagnosis of these traits as deviant or bizarre and would in turn avoid the psychological harm that could result from internalizing these attributions. Yet a medical diagnosis would not obviously be any better at avoiding psychological harm to these individuals than the absence of one. A medical diagnosis could indicate that the condition should receive medical treatment, which some people with conditions falling along the autistic spectrum might be reluctant to accept. It could reinforce the idea that they have a mental disorder. For these individuals, the idea of having mental traits that are simply different from the traits of others might be preferable to having a diagnosis.

I will now discuss neurological and psychiatric disorders in which there are radical swings between normal and abnormal mental states and behavior at distinct times. Three principal questions motivate the discussion of these cases: (1) On what basis should a condition be diagnosed as a mental disorder or psychopathology? (2) Would treatment for these conditions be in a person's best interests? (3) How does the condition affect the properties of psychological unity, continuity, agency, and embodiment that constitute the self? If an individual identifies with a particular set of psychological properties that constitute his or her self, and cognitive-behavioral or psychopharmacological interventions alter these properties, then these interventions can alter the self (Ramachandran, 2003; Damasio, 1999, 2003; Kircher and David, 2004). Yet some individuals with conditions diagnosed as psychopathologies may identify with the self that is constituted by the very same properties symptomatic of these psychopathologies. These may be selves with which these individuals are quite happy and would not want to change. At the same time, the cognitive or affective impairments symptomatic of these conditions may pose a risk of harm to the individuals who have them.

Thus there may be trade-offs between benefit and harm in these cases. Psychiatrists, neurologists, and other medical professionals need to weigh the benefit of treating to restore normal mental functions and certain traits against the risk of causing the loss of other traits with which the individual identifies and which make life meaningful for him or her.

## Epilepsy, Bipolar Disorder and Creativity

Many artists throughout history have identified with the creativity associated with temporal lobe epilepsy, the manic phase of bipolar disorder and other disorders of the brain and mind. Studies by Norman Geschwind and other researchers have shown that the hypergraphia of prolific writers such as Dostoevsky, as well as the creativity of artists such as Van Gogh and composers like Schumann, may be attributed to hyperactivity in certain brain circuits (Geschwind and Waxman, 1975; Geschwind, 1979). Temporal lobe epilepsy has also been associated with a heightened sense of spirituality or mystical visions (Jackson and Fulford, 1997; Rho, Sankar and Cavazos, 2004). The exceptional mental ability that some individuals have as a result of these disorders is something they are reluctant to give up.

Despite any experience of rapture associated with a heightened sense of spirituality or with creative writing, untreated epilepsy poses the risk of uncontrolled seizures and extensive damage to many brain regions. It does this by disturbing the balance between excitatory and inhibitory neural circuits in the brain, resulting in hyperactive excitatory circuits. In severe cases, epilepsy can lead to coma and death. In bipolar disorder, the potential harmful consequences of both manic (impaired reasoning, impulsive judgment) and depressive (suicidal ideation) phases of this condition are so significant that failure to intervene with lithium or other equally effective drugs would be difficult to justify. When a person's artistic creativity or other cognitive and affective talents are associated with a neuropsychiatric disorder and psychopathology, he may insist that life for him would be worse if regulating the disorder came

at the expense of his creativity. But if such a person is under the care of a physician, the patient's decision to refuse treatment for this reason could be overridden by the physician. This could be justified if the physician judged that the disorder posed a significant risk of harm to the patient or to others, and that the patient was incapable of understanding these risks.

The compulsion to write that is symptomatic of hypergraphia could prevent one from attending to more immediate and important matters, such as attending to the needs of one's family. During a manic phase or an epileptic seizure causing a mystical vision, someone might believe that he had a choice between retaining his symptoms and controlling or eliminating them through treatment. Yet the compulsive nature of hypergraphia or other creative urges suggest that he would not have the cognitive control to rationally consider the long-term consequences of not seeking treatment. He would lack or have an inadequate degree of competence and decisional capacity, and any choice in the matter might not really be his to make.

There are important differences between conditions such as temporal lobe epilepsy or bipolar disorder, on the one hand, and autism spectrum disorders, on the other. In the second type of disorder, there is a marked contrast between exceptional mental ability and mental disability, both of which are functions of an underlying neurological or psychiatric disorder. In cases where one has symptoms like those of Dostoevsky, the contrast is between an exceptional ability associated with a neurological or psychiatric disorder and normal neurological and mental functioning.

Even bipolar disorder involves considerable variability along its own spectrum. Bipolar II, III, and IV include episodes of depressed mood as well as hypomania and hyperthymia, which fall on the moderate to mild end of the bipolar spectrum (DSM-IV-TR, 200, 350 ff.). Unlike the extreme swings between mania and depression in more severe cyclothymic Bipolar I disorder, hypomania involves more constant and less labile mental states of exuberant mood and heightened concentration. Hyperthymia involves a state of elevated mood. Cases of hyperthymia and hypomania may constitute only a small percentage of the total number of diagnosed cases of bipolar disorder. But they suggest that symptoms characterized as part of a mental disorder may overlap with the normal range of cognitive and affective mental functions.

One might argue that, for creative individuals with bipolar disorder, lithium would not diminish one's intellectual or artistic creativity. On the contrary, it would enhance this ability by enabling one to be more organized, focused, and productive. Treatment may not always be in the best interests of people with bipolar disorder, however. In moderate forms of this condition, an affected individual may rationally decide that any benefits from pharmacological intervention would not be worth the cost of losing certain abilities.

This issue figured prominently in a case reviewed by the Supreme Court of Canada in 2003, *Starson v. Swayze* (Supreme Court of Canada, 32, 2003). Scott Starson was an engineer and computer programmer who also had a gift for physics. Diagnosed with bipolar disorder, he was found not criminally responsible for making death threats. He was detained in a psychiatric hospital, where he received various psychotropic medications for his mental condi-

tion. Starson argued that the drugs prevented him from thinking at his full capacity and that he had a right to refuse them. He claimed that the drugs made him worse off than he was before he was put on them. But a psychiatrist (Ian Swayze) responsible for his care argued that Starson lacked the mental capacity to know what was in his best interests and to understand the need for the prescribed medications. If true, this would have justified treating him against his will.

The Ontario Consent and Capacity Board confirmed Swayze's finding of incapacity. But the Board's decision was overturned by the Superior Court on judicial review. Swayze then appealed, yet the Supreme Court dismissed the appeal. On the basis of his testimony and behavior, the Court ruled that Starson was not incapacitated but was capable of knowing what was in his best interests. He was capable of making decisions about psychotropic treatment for his condition. Starson was deemed competent enough to know the difference between the consequences of having or forgoing treatment. For these reasons, his capacity to make decisions about his treatment and his right to refuse it were upheld.

All of these cases raise more general ethical questions. Do psychiatrists, neurologists and other medical professionals have an obligation only to restore normal brain and mental functions in patients with various forms of psychopathology? Or do they also have an obligation to restore the patient's normal self, the highly functional set of mental traits the person had before brain trauma or the onset of a neuropsychiatric disorder underlying the psychopathology? Strictly speaking, they would be obligated only to try to achieve the first goal, since only that goal is included among the principal goals of medicine. These include promotion of health, prevention and cure of disease, and relief of symptoms, pain and suffering (Jonsen, Siegler and Winslade, 2006, 15). In most cases, achieving the first goal will entail achieving the second. One will be a by-product of the other. But the neurological integrity of the brain may not always map so easily on to the psychological integrity of the self in every case. Symptoms of a psychiatric condition may not always justify attempts to treat them and restore the cognitive or affective traits of a patient's self to what many would consider a normal state.

## Conclusion

The neurological and psychological traits that regulate our thought and behavior fall along a neuropsychiatric spectrum that extends from normal to pathological. Yet the same person may have some traits that tend toward the normal end of the spectrum and other traits that tend toward the pathological end. Indeed, many people may possess a complex constellation of positive and negative mental traits that makes it difficult to separate them. This phenomenon suggests that "normal" should be construed more broadly in assessing a person's neurological and psychological properties. Autism spectrum disorders, especially moderate forms such as Asperger's syndrome, are unique in that people with a general set of traits that are definitively or borderline pathological may also have traits involving exceptional cognitive ability. This ability may be present even in people with moderately severe to severe mental disabilities.

The cases I have discussed involve combined salutary and pathological mental traits, or both mental ability and disability. As the Starson case illustrates, this combination may result in conflict between the interests of patients and those of clinicians. Patients may refuse treatments that are medically indicated for diagnosed psychiatric or neurological disorders. With the autonomy of the competent client as the default position, the general implication is that clinicians should treat abnormal traits and behaviors only when they pose a credible risk of harm to the client or others. This does not suggest any radical alteration of psychiatry and neurology. On the contrary, it shows that this position is consistent with other areas of medical practice.

There is a more socially significant implication of neurodiversity. Blurring the boundaries between normal and abnormal traits along a segment of the neuropsychiatric spectrum may reduce the negative perception of people with mental illness. It would make it more difficult to marginalize them. This in turn might help to reduce the stigma attached to mental illness and minimize harm to those affected by both illness and social attitudes toward it.

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