

The Blessing and Burden of Biological Psychiatry

Walter Glannon PhD

Canada Research Chair in Medical Bioethics and Ethical Theory

Departments of Philosophy and Community Health Sciences

University of Calgary, Alberta, Canada

ABSTRACT

All psychiatric disorders have a neurobiological basis. This has led to a better understanding of these disorders and a reduction in the social stigma associated with them. But the claim that mental states can be explained entirely in neurobiological terms may give us de-stigmatization at the cost of de-personalization. A holistic view of the mind as distributed among the brain, body and environment provides the best model to guide interventions that will have the most salutary effects on the brain and the mind.

Key Words: anxiety, cognitive-behavioural therapy, depression, environment, neurobiology, obsessive-compulsive disorder, stigma

Depression, anxiety and other disorders of the brain and mind have never been treated on a par with bodily diseases such as heart disease and cancer. This inequality has persisted despite the fact that psychiatric disorders affect millions of people globally and often involve severe mental and physical disability, lost productivity and impaired quality over much of their lives (World Health Organization, 2004). One recent report estimated that severe mental illness is associated with an annual loss of earnings totaling \$193.2 billion in the United States alone (Kessler et al., 2008). Depression is projected to be the leading cause of burden of disease in developed countries by the year 2030 (Mathers and Loncar, 2006). For years, many claimed that psychiatric conditions did not warrant being classified as illnesses. Diseases of the body were taken seriously. Disorders of the mind were often dismissed as imagined or feigned, presumably because there was no biological basis of their etiology and symptomatology. According to a national survey commissioned by the Canadian Medical Association and released in August 2008, a significant number of people still hold this view. Nearly half of one thousand Canadians surveyed said that mental illness is not always real but an excuse for bad behavior and personal weakness (Canadian Medical Association, 2008).

People with these conditions suffered from a double curse. There were few effective treatments to control or alleviate their psychological and physiological symptoms. And rather than elicit sympathy, they became objects of discrimination and had to endure the social stigma attached to deeply misunderstood conditions. People with neurological disorders such as epilepsy have also suf-

fered from a similar misunderstanding, though not to the same degree as those with psychiatric disorders. This may be due to the fact that for many years electroencephalography (EEG) has been able to detect seizures, and some neurosurgeons have been able to initiate seizures in the temporal lobes of some of their patients. Misunderstanding of mental disorders is partly responsible for the inadequate funding of treatments for these disorders by health care systems in many countries. As a result, millions of people have continued to suffer from untreated or undertreated psychiatric conditions. This has been the most unfortunate legacy of mind-body dualism in medicine.

In an influential paper published in 1998, Eric Kandel outlined the beginning of a new intellectual framework for psychiatry that emphasized the neurobiological basis of the brain-mind relation (Kandel, 1998). Together with advances in genetics, this helped to establish biological psychiatry as the model for diagnosing and treating disorders of the brain and mind. The widespread acceptance of this model is reflected in part by the prominence of *Biological Psychiatry* and similar journals reporting on research and treatment outcomes in clinical psychiatry. It is also partly responsible for the inclusion of more conditions in the *Diagnostic and Statistical Manual of Mental Disorders*. Thanks largely to structural and functional brain imaging, the neurobiological model of the brain-mind relation has done much to discredit mind-body dualism and reduce the harmful effects it has had on people with mental disorders. Neuroimaging can show correlations between structural and functional brain abnormalities and symptoms of these disorders. Imaging can also display and monitor the effects of psychotropic drugs prescribed for these conditions on the brain. This has led to the development of more effective drug therapy. In addition, epidemiological studies of obsessive-compulsive disorder and other psychiatric conditions indicate that their symptoms are strikingly similar across cultures (Matsunaga et al., 2008; Pallanti, 2008; Canino and Alegria, 2008). They are more deeply embedded in common neurobiology than in cultural differences.

These empirical findings confirm that psychiatric disorders do indeed have a neurobiological basis. Biological psychiatry has done much to dispel the view that these conditions are "all in the mind" and as such not illnesses at all. Once it became clear that the brain was the organ that generates and sustains our mental states, and that brain dysfunction could result in mental dysfunction, it also became clear that what occurred inside the head played an important role in shaping the mind. This shift in thinking has helped to attenuate some of the stigma and discrimination experienced by

people with mental illness. It should lead to more public funding of mental health programs so that people suffering from these conditions will receive the treatment to which they are entitled.

The diagnosis and treatment of mental disorders should not be based entirely on neurobiology, however. Physiological and psychological symptoms of many if not most psychiatric disorders are a function not only of the brain but of interaction among the brain, body, and environment. The hypothesis that a maladaptive response to external stimuli plays a key role in the etiology and pathophysiology of major depressive disorder, generalized anxiety disorder, and obsessive-compulsive disorder motivates therapies that aim to alter the individual's relation to the environment. This may be achieved by removing or altering the stimuli causing or exacerbating the brain dysregulation underlying these disorders. Therapies may also consist in helping the individual to reframe his or her beliefs so that the contents of these beliefs align with the actual nature of events to which they are directed. This can alter one's misperception of external events so that one perceives them as opportunities to navigate or engage with rather than as threats to avoid.

Studies of adults and adolescents with moderate to severe depression have convincingly shown that combined pharmacotherapy and psychotherapy, particularly cognitive-behavioral therapy (CBT), is generally more effective than drug treatment alone (Keller et al., 2000; American Psychiatric Association, 2000; Pampallona et al., 2004; March et al., 2007). This combination can help to prevent relapse and make drug treatment safer by reducing the risk of suicidal ideation. A recent study showed that combined antidepressant (SSRI) therapy and CBT resulted in a highly positive response rate in children with anxiety (Walkup et al., 2008). The effectiveness of psychotherapy for depression and anxiety shows the significance of one's mental states and the environment in both the development and treatment of this disorder. The content and qualitative aspects of our beliefs and emotions cannot be separated from the social and natural context in which we have them. Repeated exposure to a fearful situation in a controlled setting may also enable one to reframe one's beliefs so that they align with the actual nature of external events and thereby attenuate anxiety or phobia. This may involve being placed in a particular social or physical setting or in a virtual reality program that mimics these settings.

Addiction is another psychiatric disorder where environmental intervention can be effective in controlling craving and related symptoms. Dopamine antagonists have shown promise for controlling some addictions by modulating a dysregulated mesolimbic dopamine system in the brain (Franken, Booij and van den Brink, 2005). The anticonvulsant drug topiramate has also shown promise for treating cocaine and alcohol dependence (Kampman et al., 2004; Johnson et al., 2007). Research has yielded a better understanding of the underlying neurobiology of addiction (Kalivas and Volkow, 2005). Yet craving a substance can be influenced by social or physical cues reminding the individual of the substance to which he or she is addicted (Elster, 1999; Ainslie, 2000, 2001). Eliminating these cues by altering the social and physical setting or by removing the individual from it is one way of treating the addiction. Depending on availability and access, heroin addicts may go to methadone clinics to control their addictions. All of these measures could be combined with CBT offering the addict incentives to moderate his or her steep discounting of the future

consequences of giving in to the desire for immediate gratification. Brain-environment interactions are critical to the development and treatment of this and other psychiatric disorders.

Imaging studies suggest that psychotherapy can change structures and functions of the brain and thus "re-wire" it in a manner different from the effects of pharmacotherapy (Baxter, 1992; Martin et al., 2001; Paquette et al., 2003; Mayberg et al., 2004). It can have a positive "top-down" effect on prefrontal cortical areas associated with some symptoms of mental disorders, complementing positive "bottom-up" effects of drugs in limbic and subcortical areas associated with other symptoms of these same disorders. Imaging can display the modulating effects of CBT on an overactive anterior cingulate cortex and rostral caudate nucleus responsible for the heightened "worry" circuit implicated in obsessive-compulsive disorder. This is in addition to the ability of imaging to display positive effects of CBT and other forms of psychotherapy on cortical function in patients with depression and anxiety.

Although these results are preliminary and will have to be replicated, they suggest that our mental states are not simply a product of linear causation ("bottom-up") from the brain. The brain is not the sole cause of or influence on the mind but is a relational organ that shapes the mind by mediating interaction between the organism and the external world. (Fuchs, 2008) The mind is not located in the brain but is distributed among the brain, body, and the environment in which the organism, or subject, is situated. (Fuchs, 2008; Clark and Chalmers 1998) Our mental states are the emergent products of circular causation consisting of neurophysiological, environmental, and social influences continuously interacting with each other in a series of positive feed-forward and negative feedback loops (Fuchs, 2004; Fuchs 2005; Kendler 2005). Disordered states of mind result when something goes awry in this process. A chronic negative perception of stimuli from the environment, or a prolonged stress response to these stimuli, can trigger a cascade of pathological events in the hypothalamic-adrenal-pituitary axis and result in the symptoms of depression or anxiety. The causal pathway goes from the mind, or the subjective experience of the situation, to the brain and body, and then back to the mind. Yet dysregulation of the brain and mind can be ameliorated or corrected by intervening in a critical part of this pathway and altering the subject's beliefs about the environment. This suggests that mental states are not epiphenomenal to brain states but can have a causal influence on them.

The effectiveness of psychotherapies that utilize environmental influences on the brain and mind supports the circular causation model for understanding and treating at least some mental disorders. Therapies that enable one to reframe beliefs do not just have positive effects on cognition or mood. More importantly, these effects can change the subject's behavior so that he or she can once again engage in interpersonal interaction and experience positive relations with others in the world. Drug therapy targeting the relevant neuronal pathways and neurotransmitter systems treats only one dimension of these disorders. Non-pharmacological therapies that aim at altering one's thought and behavior operate on the recognition that beliefs, emotions, and other mental states are inseparable from the social and natural world in which one is embedded as a human subject.

All psychiatric disorders have a neurobiological underpinning.

But they are not *just* neurobiological. The reductionist claim that these disorders can be explained entirely in neurobiological terms may give us de-stigmatization at the cost of de-personalization (Fuchs, 2004). Emphasis on impersonal brain mechanisms may eliminate feelings of guilt or shame in those with psychiatric disorders, as well as the tendency of others to blame individuals for having them. Yet by focusing on the brain rather than the person, biological psychiatry may lose sight of the fact that we are agents interacting with others and that our minds are essentially shaped by this interaction. As psychiatrist and philosopher Thomas Fuchs points out: "A reductionist biological concept of mental life may lead to a self-alienation: in the wake of a popularized neurobiology, we are beginning to regard ourselves not as persons having wishes, motives, or reasons, but as agents of our genes, hormones, and neurons." (Fuchs, 2004, p. 483) In this regard, biological psychiatry may have negative implications for free will. A neurobiological model that explains disorders of the mind entirely in terms of brain mechanisms may strip persons of their autonomy and agency. It can weaken the conviction that persons have the capacity to regulate and guide their mental states to intended actions and thus be the authors of their behavior. Such a model can undermine the belief in self-determination by reinforcing a learned helplessness and the belief that all of our thought and behavior is controlled by the brain. Rather than support the idea that persons can be effective agents in the world, biological psychiatry risks giving us the idea that everything we do is at the will of the brain. Whether it is pathological or normal behavior, one may be left with the idea that "my brain made me do it" (Gazzaniga, 2005, Chapter 5)

Responding to Francis Crick's reductionist claim that we are "nothing but a bunch of neurons" (Crick, 1994, p. 3), neurobiologist Steven Rose expresses the same conception of the brain-mind relation that I have outlined:

"We" are a pack of neurons, and other cells. We are also, in part by virtue of possessing these neurons, humans with agency. It is precisely because we are biosocial organisms, because we have minds that are constituted through the evolutionary, developmental, and historical interaction of our bodies and brains (the bunch of neurons) with the social and natural worlds that surround us, that we retain responsibility for our actions, that we, as humans, possess the agency to create and re-create our worlds (Rose, 2005, p. 305).

Exclusive emphasis on the neurobiological basis of the mind fails to appreciate the extent to which the content and qualitative aspects of the mind are a function of factors both inside and outside the brain. There is no plausible conception of psychiatry, or indeed any area of medicine, that treats the person as nothing more than a self-contained biological entity. A holistic view of the mind as distributed among the brain, body, and environment, where the brain is a relational organ that mediates interaction between the human subject and the environment, provides the best model to guide interventions that will have the most salutary effects on the brain and the mind. Such a model can help to reduce the social stigma associated with psychiatric disorders and retain a robust sense of personhood and agency necessary for these effects to be realized.

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Address for Correspondence:

Walter Glannon
Departments of Philosophy and Community Health Sciences
University of Calgary
2500 University Drive, NW
Calgary, AB, T2N 1N4, Canada
Email: wglannon@ucalgary.ca