

Diagnosing Mental Illness₁

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Abstract

Descriptive taxonomies for psychopathology were a useful innovation in 1952. They worked to focus attention on the unreliability of some psychoanalytic diagnostic terms. But as reliability concerns became dominant, interest in validity disappeared. Instead, psychiatric disease entities multiplied on the surface, unconstrained by even the least controversial assumptions about common elements that might underlie symptom presentations. A more balanced approach to diagnosis is presented in this paper.

Introduction

Scientific understanding progresses through three basic stages: description, prediction, and control. Careful observation and description of salient, palpable aspects of natural phenomena is where understanding begins. It is the “fire and water” stage: an Aristotelian differentiation of one thing from another. Once objects are defined, the questions become: “How are these things related in time and space?” “Are they in causal relationships?” This is where experimental science comes in. Galileo’s experimental studies stand in contrast to Aristotelian methods based on the hope that describing every last detail on an object’s surface will reveal some “essence” or truth lying underneath.

Descriptive classification of mental disorders is an essential step in diagnosing mental illnesses. The Diagnostic Manuals of Mental Disorders published by the American Psychiatric Association (DSM) contain descriptions of mental conditions. The first DSM was issued in 1952. It has been revised four times to date¹ and a fifth revision is scheduled for May of 2013. The impetus for creating such a manual was the wide disagreement about what constituted “mental illness.” The old story was that if you had ten psychoanalysts examine the same patient you would get back ten different diagnoses. It made sense to try to develop reliable categories for psychiatric disorders. North American clinicians will now need to shift from use of the DSM-IV disease categories to codes listed in the International Classification of Disease (ICD-10-CM) of the World Health Organization (WHO).

The ICD-10-CM codes are the international standards that United States insurers currently use to code for reimbursing psychological services. The Center for Medicare and Medicaid (CMS) is revising its codes to comply to with WHO codes by October 2014 in order to comply with the Affordable Care Act (ACA) of 2010. The ICD-10 psychiatric

¹This article is adapted from Bernstein, W.M. A Basic Theory of Neuropsychanalysis. 2011 London: Karnac Books

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disease entities are all comprised of clusters of easily observable symptoms. There is nothing inherent in these proposed changes that alters any comments in this paper.

Reliability

Psychometric Reliability has two aspects of interest here: Inter-Rater Reliability and Inter-Item Reliability. Both are easily quantified statistically (e.g., alpha coefficient for items; kappa coefficient for raters). Inter-Rater Reliability involves agreement between observers. For example, if all clinicians decide that a patient belongs in diagnostic category x and not y or z, inter-rater reliability is perfect. In practice, if about 85% of observers agree, inter-rater reliability is pretty good.

The basis on which different observers make their decisions about the type of illness the patient has is the similarity of the assumptions they make about what is pathomononic for a particular disorder. The DSM-IV uses sets of symptom descriptions that define each of over 400 presumably distinct disorders. The items making up the sets of symptoms are presumed to occur together more or less for each disorder. This is called Inter-Item Reliability. For example, the symptom list for Major Depressive Disorder includes: “depressed mood most of the day as indicated by subjective report or observation made by others”; “markedly diminished interest or pleasure in all or almost all activities of the day nearly every day”; “significant weight loss”; “insomnia”; “feelings of worthlessness”, and so on.

Since most but not all patients with major depression have insomnia, for example, the alpha coefficient will be something less than perfect. The idea behind the DSM is that if you give all the clinicians lists of symptoms with high inter-item reliability, you should get good inter-rater reliability about the diagnoses.

All the versions of the DSM (and, ICD-10-CM) have had had low inter-rater and inter-item reliability.² But one should not be too surprised or disturbed about that. The DSM-V will also have poor reliability if the strategy for producing it is similar to the previous versions.

The DSM was a good idea. One must attempt to first describe explicitly the phenomena one wants to ultimately predict and control. And, symptom descriptions are helpful in choosing and modifying psychopharmacological regimes, which, of course, are used primarily to treat symptoms. But producing a DSM-V is “gilding the lily.” Making finer and finer descriptions of the same old data is not the way to go forward. Continuing to cluster symptoms in slightly different combinations to define what are imagined to be unique syndromes is now largely a waste of time.

An appeal of the DSM is that it makes psychiatry like other branches of medicine. It too has diagnostic codes for each disorder. (And, the medical insurance industry in the US uses these codes for a variety of their less than admirable purposes). Such pseudo-precision makes it seem that doctors know more than they really do. For example, the term affect refers to a concept whose meaning is very ambiguous. This sometimes makes it hard to operationalize measures of affect in basic and applied biological or psychological research.³ But researchers and clinicians behave as if they know what it means generally, and use it constantly in the way that words are used by non-scientists or what Fritz Heider called the person, a naïve scientist.⁴ The general plausibility of concepts can be conflated with ambiguity about what they actually mean.

The major barrier to increasing the reliability of DSM diagnoses is that there are not over 400 totally unique, underlying mind-brain processes working to produce all of these symptom presentations. Similar symptoms appear in many patients; hence the diagnostic categories cannot be differentiated neatly and reliably from each other by means of symptom presentations alone. The brain, like all other organs, goes wrong 80% of the time in a relatively small number of predictable ways. The mind, conditioned by culture, is more creative with its manifestations of illness. But one of Freud's great insights was to see common mental processes underneath the apparent variety of psychopathological presentations.

The Five Dimensions of a DSM Diagnosis

A complete DSM diagnosis includes ratings made on five different dimensions or "axes." Axis III includes the patient's medical, non-psychiatric conditions, and Axis IV attempts to identify social stressors in the patient's environment. Axis V is a summary rating of the person's functionality. These are important things to account for. The most important and problematic ratings involve Axes I and II.

Axis I is used to rate mood, anxiety, cognitive, psychotic, and somatoform disorders. These include Unipolar Depression, Bipolar Depression, Generalized Anxiety, Dementia, Schizoaffective Disorder, and Hypochondria. Most Axis I disorders can be treated today more or less effectively with drugs. The major exceptions to this rule are somatoform conditions, PTSD, and dementias. Axis II is the remnant of psychoanalytic diagnostic ideas. It contains 10 Personality Disorders, including Dependent, Histrionic, Avoidant, and Antisocial. It also includes Mental Retardation. Why is that?

Probably the best way to differentiate Axis I from Axis II is that Axis I disorders can be treated more effectively, usually with drugs, than personality disorders and mental retardation. Politics and economic issues affect, in part, DSM decisions. Patients and doctors would rather deal with a treatable Axis I disorder than a harder to treat Axis II disorder.

Fourteen different committees each comprised of people from different schools such as psychiatry, clinical psychology, and psychoanalysts produce the DSM. The manner in which obsessive-compulsive anxiety problems have been classified may indicate how such committees operate to some degree. They use compromise formations. For example, OCD can be treated more or less effectively with drugs and with cognitive therapies. It is classified as both an Axis I Disorder and an Axis II Personality Disorder, thereby satisfying both the pharmacologists and the clinical psychologists. Similarly, every patient I have seen in over 25 years who was diagnosable with "Borderline Personality" (an Axis II Disorder), was also diagnosable as having Bipolar Disease (An Axis I Disorder). What are supposed to be the relationships between these "Axes"? The Axes are not especially helpful in integrating ideas about the causes of the numerous disorders.

In any case, everyone knows that the DSM is inadequate. There is no reason to make another edition. We should be making attempts to base our diagnostic taxonomy on valid theories of the etiology, the mind-brain processes, and the courses of mental illnesses. The reliability of measuring instruments are essential for assessing the validity of concepts. But we are not interested primarily in the reliability of the thermometer. Rather, reliability is in the service of finding true causes and effective treatments for the fever.

Personality

The psychoanalytic school now has published their own diagnostic scheme, the Psychodynamic Diagnostic Manual or PDM.⁵ As we might have imagined, their Axis I includes Personality Disorders and their Axis II describes symptoms. They have used most of the Personality Disorders from the DSM but made a good change by relegating the term “borderline” to its original usage as a severity variable, rather than having it as a discrete type of personality. The PDM is more thoughtful than the DSM but it too is largely an Aristotelian definitional approach to mental illness. It is concerned primarily with mental structure but not mind-brain processes.

Personality can be defined as the sum total of all the person’s mental habits. The entire set of habits is systematically influenced by the first foundational self-concepts. In mental illness these foundational concepts are in a more or less chronic state of unresolved conflict. Sensory stimulus arrays or releasers of conflicting instincts and learned habits to both approach and avoid objects in the external world and the mind itself, stimulate signal anxiety.

In response to signal anxiety, individuals develop compromises in the form of mental habits that work more or less well to regulate thought, feeling, expectations, and overt behaviour. These compromise habits usually work to suppress awareness of the self-concept conflicts that cause signal anxiety. The foundational conflicts are frightening. They imply severe punishment for imagining taboo pleasures. These concepts were formed early when young children behaved like primitive people who are governed by the Rule of Talion or an “eye for an eye.” Incestuous and aggressive impulses are imagined to result certainly in severe, painful punishments.

At the foundational level, mind-brain conflicts are set in zero-sum relationships of the form: “Pleasure is a sin and must be followed by pain”; “If I live or am happy, mummy must die or be unhappy”; and so on. Of course, such concepts develop in the first years of life when the child is without the benefit of formal logic. Later in life, when adults come to treatment, I tell them that “Reality is your friend. Logic can help you create more room for thinking and allow you to consider many potential options for coping with conflicting wishes.”

The compromise formations resulting from unresolved conflict are derivative or secondary defenses such as rationalization and pseudo-logical thinking. “Personality Traits” such as dependence, avoidance, histrionics, and so on, are also types of derivatives. When people are diagnosable as having, for example, a Dependent Personality, not all of the personality is causing troublesome symptoms. Tendencies to depend on others can work to get the person into treatment, into marriages, and to be able to be comforted by therapists, wives, and others. In other words, most of the dependent traits do not operate as proximal causes of their prominent symptoms. Rather, there are deeper, distal causes working to both stimulate and support the proximal defensive habits that caused symptoms. This relationship between distal and proximal causes is revealed when using EMDR and analyzing dreams. Attending in dreams or during EMDR to recent troubling events, leads to activation of concepts and memories associated with the events such as childhood traumas.

Perhaps we could neutralize the anxiety producing effect of foundational conflicts by stunning the brain structures supporting them with Deep Transcranial Magnetic Stimulation. Alan Snyder and his group in Sydney Australia have demonstrated

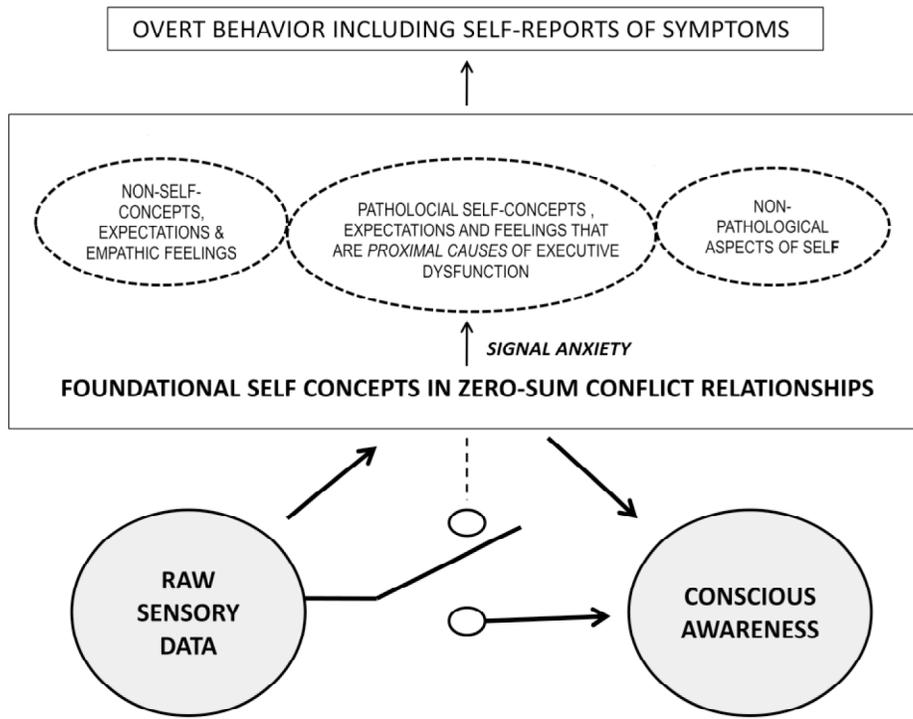
convincingly that concepts can be ‘turned-off’ by applying magnetic pulses to the surface of the brain at the left, orbitofrontal cortex.^{6,7,8} In any case, therapeutically important change is most likely to occur when treatment focuses on the proximal causes of disordered executive functioning. More or less of the personality supports these proximal causes. One does not necessarily have to resolve Oedipal Conflicts (a distal cause of defensive habits of mind), in order to gain some flexibility in regulating attentional focus without anxiety. Altering the strength of the strong habit to self-induce anxiety in stressful situations, i.e., altering the habit that is the proximal cause of anxiety symptoms, can work to increase executive functioning, especially memory.⁹ Ideally, these sorts of changes can, in turn, promote further development of more valid self-concepts to regulate the hard to change foundational structure of the self.

Figure 1 illustrates some of these ideas in the context of a general model of factors determining mental competence. Following Snyder, I assume that either concepts or raw sensory data is in conscious awareness at any one time. Concepts, specifically Semantic Concepts or Words, work to organize and contain the multiple sensory attributes of objects in the external world and the mind. For example, a “cat” contains the attributes “furry,” “friendly,” “catches mice,” etc. Figure 1, depicts “the post-concept state” in which the person is aware of something in the box above the circles (i.e., concepts, expectations and feelings). If the switch were pushed down, only raw sensory data from exteroceptors (e.g., eyes, ears), or from afferent autonomic neurons from the viscera would be in awareness. Mental competence is a function of the validity of semantic concepts used to contain and explain sense data; and; the person’s habits to activate concepts, i.e., to think about them consciously.

Regardless of whether concepts, expectations or feelings are in or out of awareness, they operate constantly as causes and effects of information processing occurring in the neocortex. Concepts contain and explain sensory data. Concepts can be more or less valid in the scientific sense of having high or low face, predictive, and discriminant validity. I define feelings as “meaningful sensations.” That is, they are sensations linked with the concept used to explain them, such as attributions of causality. For example the person might explain sensations of burning in the foot with concepts such as: “Biting Insect”; “Tight Shoe”; “Sharp Nail” and so on.

It should be apparent that DSM diagnoses focus on the box at the top of Figure 1: “Overt Behaviour Including Self-Reports of Symptoms.” The Psychoanalytic Manual (PDM) focuses on Foundational Conflicts and the entire personality, and not especially on the proximal causes of executive dysfunction. Cognitive Therapy and my approach both concentrate on the self-regulatory processes and self-concepts that are proximal causes of executive dysfunction. But the Cognitive School does not recognize the psychodynamics that are important parts of these pathological processes. Psychotropic Drugs work primarily by moderating something about the way that sensory data is processed and, thereby, can reduce anxiety, depression, and thought disorders. These sorts of changes can have subsequent positive effects on the entire personality. This was described well in the popular book *Listening to Prozac*.¹⁰

Figure 1: *Signal Anxiety, Stimulated by Conflict, Activates Compromise Concepts and Processing Habits That May Cause Symptoms*



Model for a Diagnostic System

It is now a commonly accepted idea that ‘the mind is the functioning of the brain’. It makes sense therefore to search for valid mind-brain relationships when devising a diagnostic scheme for mental illness. There has been an explosion of studies using scanning technologies including functional MRI to correlate subjective phenomena with brain activity.¹¹ This sort of work will produce valuable knowledge and controversy for years.

In the meantime, few workers have done as much as Daniel Amen to correlate brain activity with psychopathological presentations of symptoms.^{12, 13} Amen¹⁴ presents a set of SPECT scan images that he correlates with different forms of psychopathology. I have adopted parts of his results and those of others to differentiate a basic set of mental disorders with different underlying brain activity.

Figure 2: Anatomical/Functional Correlates of Symptom Types: Scanned Variations in Blood Flow, Metabolism (cf., Amen, 2003)

DEPRESSION	↑ Deep Limbic (thalamus)
COGNITIVE – ADD	↑ Basal Ganglion & Deep Limbic ↓ Pre-Frontal Cortex
ANXIETY	↑ Basal Ganglion
BIPOLAR	Left Basal Ganglion & Deep Limbic: Multiple Focal Points: ↑ Manic ↓ Depressed
PSYCHOSIS	Wide-spread tissue loss in teen years In Schizophrenia (e.g., Thompson et al, 2001)
SOMATOFORM	↓ Caudate Nucleus (Hakala et al, 2003; 2004)

I am proposing six basic forms of functional mind-brain pathology as the foundation of a neuropsychanalytic diagnostic system. The six basic syndromes are: Anxiety, Cognitive Dysfunction, Depression, Bipolar Disease, Psychosis, and Somatoform Disorders. They are functional psychopathologies as distinct from psychological problems caused by relatively unchangeable underlying neurological conditions such as Mental Retardation, severe forms of Autism, Tourette’s syndrome, and Dementias caused by Alzheimer’s disease or extensive brain damage. The six syndromes satisfy important criteria for scientific validity:

- Face Validity: One can recognize each syndrome from words used in natural speech.
- Predictive Validity: We can specify predisposing factors and course for each.
- Discriminant Validity: Different brain regions are affected in each condition. And, particular drugs work for some conditions but for not others.

The syndromes represent not only valid constructs supported by brain research, but also about the right amount of specificity for what we know today about mental illness. The over-precision of the DSM doesn’t help. The inclusion of the entire personality and symptoms common to the six major categories such as insomnia, sexual problems, addictions, social avoidance, and so on, gives rise to all sorts of confusion. Treatment methods based on all of patients’ symptoms are likely to miss the key mental habits that are the proximal causes of dysregulation of feeling and thought. Amen’s SPECT scan results, plus results from others, are shown in summary form in Figure 2.

I have developed a set of symptom measures for each disorder. The items come from a variety of sources and include classical and some less widely recognized indicators of anxiety, depression, and so on. The clinician rates the extent of each symptom at initial evaluation of each patient on a 5-point Likert Scale (0 =none; 1=slight; 2=moderate; 3 =great; 4=very great). Sometimes we make the rating ourselves and sometimes we ask patients to make ratings while we are talking. We don't give them a rating form to fill out.

Causal System of Pathologies and Etiological Factors

If we have identified reliable disease constructs, we can start to study the causal relationships between the disorders themselves and common etiological factors. Multivariate statistical methods are particularly suited for such problems. Figure 3 depicts hypothesized positive and negative linear, as well as curvilinear causal relationships between etiological factors and disease syndromes.

The model specifies that Biological and Social Factors work directly to increase or decrease Internal and External Stress; Concept Validity (including self-concepts and concepts about the external social and physical worlds); Competence at Regulating Sense Data; Success at Love and Work; and, Psychiatric Disorders. Biological factors include genetics and metabolic processes. For example, it is beyond doubt that temperament is largely determined by genes.¹⁵ Temperament varies on perhaps five dimensions: emotionality, soothability, activity, attention span and sociability.¹⁶ If one is genetically predisposed to be very emotional and non-soothable, Internal Stress might be magnified. Internal and External Stress affect each other (the bi-directional arrow between Internal and External Stress). For example, a stressed baby can irritate a parent who then acts out and increases the baby's internal stress.

Genetics also have some role in producing diagnosable psychiatric disorders.¹⁷ This is indicated by the arrow from Biological and Social Factors to The Five Psychiatric Conditions in the box on the right hand part of Figure 3. Biological and Social Factors certainly affect Anxiety too, but the model assumes that these effects are indirect and mediated by Concept Validity, Competence at Regulating Sense Data, and Success at Love and Work. While many variables mediate the effect of Biological and Social Factors on The Five Other Conditions, these are not specified in the model. Non-specified causes will cause prediction errors when these sorts of models are tested statistically. But an advantage of statistical modeling is that the amount of error can be quantified and, hence, can guide further specification of variables.

Social Factors such as family income and education surely influence the amount of physical, social and mental stress a person is exposed to, as well as their ability to develop coping mechanisms.¹⁸ For example, living in an abusive social environment causes stress and impedes psychological development.

An enormous number of Biological and Social Factors influence Stress levels, the Validity of Concepts concerning the Self and the rest of nature, Competence at Regulating Sense Data, and Success at Love & Work. And, each variable has its own more or less unique sort of causal effect on variables downstream in the sequence of events leading to mental competence or mental illness. For example, social status might simply lower External Stress (an inverse, linear relationship). Or, moderate levels of social status might lower stress, but very high or very low status might increase stress (a curvilinear relationship). Similarly, the stress of intense physical pain is likely to decrease the development of Competence at Regulating Sense Data (an inverse linear effect). But

there is reason to believe that moderate levels of stress experienced at the hands of the mother best promote regulatory competence. This is the sort of curvilinear relationship between stress levels and development described by Kohut's concept of optimal empathic failure.¹⁹ The figure uses arrows without explicit (+) or (-) signs to indicate that causal effects may include positive and inverse linear effects as well as curvilinear relations.

The model is more definitive regarding the hypothesized causal relationships between Self and Non-Self Concept Validity, Competence at Regulating Sense Data, Success at Love & Work, Anxiety and The Five Other Conditions. I assume that Self and Non-Self Concept Validity, Competence at Regulating Sense Data, and Success at Love and Work (i.e., one's overt behavioral competence) are in bidirectional, positive, linear causal relationships. That is, holding valid concepts about the self and the rest of nature including social life promotes Regulatory Competence and Success in life. And, Regulatory Competence and Success in life tend to promote the development of Self- and Non-Self Concept Validity. These relationships are indicated in the figure by the bidirectional arrows tagged with (+) signs.

High Competence at Regulating Sense Data and the Success in life it fosters, operate to reduce Anxiety. And, Anxiety affects Regulatory Competence and worldly Success. These are assumed to be bidirectional, inverse (-), linear relationships. Self and Non-Self Concept Validity, Competence at Regulating Sense Data, and Success at Love and Work are also assumed to be in inverse, linear, bidirectional causal relationships with The Other Five Psychopathologies. For example, low Concept Validity causes Cognitive problems; and, decrements in cognitive function operate to inhibit the development of valid concepts.

Anxiety, especially chronic anxiety, is arguably the first and most important cause in a chain of events leading to more serious mental disorders. Control of Anxiety after all, if based on real threats to life and limb, confers an evolutionary advantage to the individual by stimulating fight or flight behaviors. This implies that there should be strong evolutionary pressures promoting competent anxiety regulation. The other disorders do not seem to promote survival. But some have argued that being depressed might improve decision making.²⁰ Defensive operations are focused on controlling anxiety. There are really no comparable "defenses" against Depression, Somatoform, Cognitive, Bipolar or Psychotic Disorders. The model assumes these syndromes are caused, in large part, by failures in anxiety regulation.

Freud felt that mental development depended on coping competently with loss and grief. He is famous for claiming "the superego is the residue of lost object cathexes."²¹ That is, grief is processed by incorporating some of the valued attributes of those we have loved and lost in our own self-concepts. Does this process require a major depression to operate? Maybe, but clearly the issue determining the utility of any mental condition is chronicity. A little psychotic perspective now and then might give one insight. I am even recommending the use of hallucinogens in psychotherapy. But it seems implausible on the face of it that being chronically anxious, depressed, or psychotic can be especially useful. Chronic depression, for example, has been strongly associated with cardiovascular disease and diabetes.²²

In any case, that mind-brain states resembling mental illness might have some beneficial effects is not central to this diagnostic scheme. What is more central is the assumption

that the Five Other Disorders in our system are related to each other and that each is downstream from Anxiety. The model in Figure 3 specifies that the Other Five Psychopathologies increase as a direct linear function of Anxiety. Classic vegetative depressions serve as a prime example of this causal sequence.

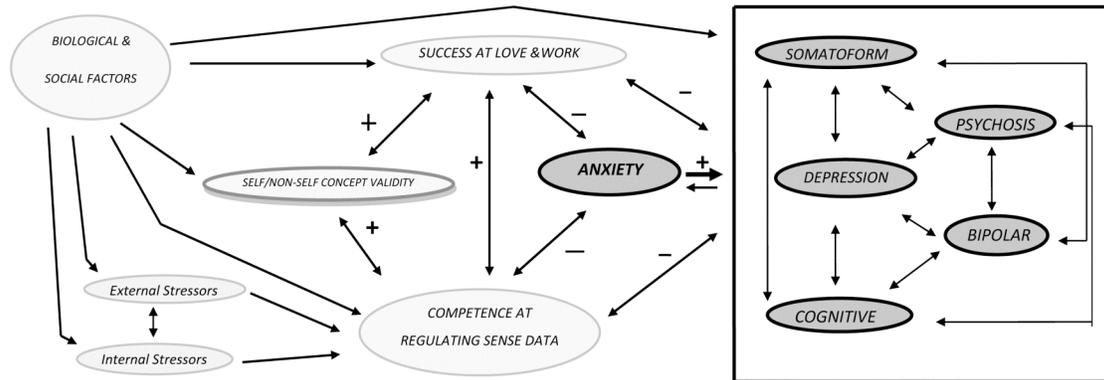
Many of the cases of Depression, perhaps the majority, result from chronic Anxiety. At a certain point after suffering from uncontrolled anxiety for an extended period, catecholamine and other neurotransmitter systems become deranged and high levels of cortisol are produced. Then, post-synaptic catecholamine receptor systems become altered, usually by an increase in the number of post-synaptic sites. This can cause disuse-hypersensitivity.^{23, 24} Once the number of receptor sites increases abnormally, small amounts of catecholamine in the synapses result in large sympathetic responses, especially on cardiac output and subsequently, hypertension.²⁵ An array of such complex processes in response to chronic stress and anxiety leads to vegetative depressions. If not treated, depressions may escalate via regressive defensive operations into Cognitive, Bipolar, Psychotic or Somatoform syndromes.

The model also specifies that Depression, Cognitive, Somatoform, Bipolar and Psychotic conditions affect Anxiety levels. How these syndromes affect Anxiety is complicated. For example, in the Somatoform condition of Conversion, otherwise free-floating anxiety is contained or explained by physical symptoms such as paralysis or pseudo-seizures. This sort of defensive operation can reduce felt anxiety (e.g., la belle indifference). Accordingly, the model depicts the effects of the Other Disorders on Anxiety with an arrow indicating that these effects may be positive, inverse and/or curvilinear. In any case, Anxiety is almost always a feature of the Five Other Types of mental illness depicted in Figure 3. This is consistent with the idea that it is a temporal precedent of the other conditions, and that it usually persists as symptoms ramify.²⁶

What about the relationships between Depression, Cognitive, Somatoform, Bipolar and Psychotic forms of illness? Certainly, the symptom presentations for these syndromes are much correlated. The model assumes some of the correlations indicate causal relations. The etiology of each syndrome involves some unique factors and some factors common to them all. The common sorts of factors include: Distal genetic, metabolic and social causes; derangements in neurotransmitter levels and transmitter receptor systems; changes in intracellular second messenger systems affecting protein synthesis in the neuronal nucleus; changes in functioning in various brain regions and, psychological causes such as information processing habits.

The nature and magnitude of the relationships between the disorders (correlation and causal) can only be specified with more validity by empirical research. The first step in such research is to unambiguously describe hypotheses about the relationships. Then, the research must be done to disconfirm and refine the hypotheses. And, the amount of error in any presumed relationship can be specified quantitatively by structural equations. The model depicted in Figure 3 is composed of reliable concepts of disease entities and plausible relations between them. It is as a general framework for making models that specify more of the enormous complexity of the Body-Brain-Mind System.

Figure 3: Causal System of Six Pathologies and Etiological Factors



Note: Arrows indicate directions of hypothesized causal effects. (+) marks indicate linear positive effects; (-) marks indicate linear inverse effects. Arrows without (+) or (-) marks indicate positive and inverse linear effects, and curvilinear effects.

Evolution, Somatoform Disease and Health Care

The competence to remember, process, and reflect upon semantic concepts makes the human brain-mind unique. Compared to how evolution operates via genetic changes and selection pressures among other creatures, human viability is more dependent on the validity of concepts learned over the history of the species—that is, culture—and during the life of each individual.

In non-humans, genes and the instinctual fixed action patterns that they promote almost entirely determine survivability of species and individuals. Individuals carrying genes conferring high selective advantages will be eliminated at a slower rate than others and produce more offspring. With raw evolutionary forces operating as “executive” the entire organism is killed for being less than optimally competent instinctively.

Changing mind-brain by learning and activating valid concepts about nature and the self can delay complete organismic death. A key executive function is to deactivate invalid concepts and activate better ideas. In other words, the executive must use a sort of Kill Switch to turn off repetitive, non-helpful ideas. Mental illness involves deficits in executive functioning. Those suffering from psychopathology habitually repeat thoughts, expectations, feelings, and behaviors that are based on invalid self-concepts. It is of course difficult to kill something, especially perhaps an idea one is familiar with and has, in a fashion, come to love. But nostalgia for old crap is perhaps the greatest barrier to human growth.

Science and educational institutions have important roles in finding more and more valid concepts to explain biological, psychological and social aspects of nature. Governments, businesses, legal authorities, and religions are responsible for using these ideas. In particular, there is an urgent need for increased cooperation between science and government regarding health care.

The strain on health care resources throughout the world is based to a large extent on ignorance about the relationships between mental and physical illness. Estimates of the proportion of patients presenting to primary care physicians for symptoms due to psychosocial stress range from 30% to 72%.^{27, 28} In one large hospital's Emergency Department, 76% of patients presenting with "chest pain" had no discernible cardiac abnormalities.²⁹ In short, this is what we all know:

"Patients with somatization have overall health care expenditures nine times that of unaffected persons and over 82% of patients with somatization stop working because of their health problems."²⁸

It is difficult to differentiate and integrate diagnoses of mental and physical illnesses. However, not attempting to do so routinely causes patients and world economies to suffer. Every illness affects the mind and body. For example, heart disease causes anxiety and depression, and anxiety and depression cause heart disease. Somatoform illnesses such as fibromyalgia, hypochondria, conversion disorders, and chronic pain syndromes are widespread. This does not mean that there are no tissue changes outside the brain in such cases, but that the primary cause of the illness is psychological.

Somatoform patients usually present first to Emergency Departments, internists, rheumatologists, and neurologists. So, they are rarely given treatments for their psychological problems. The rare exception is Abbass' work.²⁹ He instituted psychological examinations and, when warranted, Cognitive Therapy for frequent Emergency Department users. This reduced repeat ER visits markedly among these patients. But usually ER patients with somatoform disease receive repeated, expensive diagnostic workups, useless surgeries, and inappropriate medication regimes.

Post-Traumatic and Somatoform Disorders are among the most difficult syndromes to treat effectively. My experience interviewing fibromyalgia patients, who are mostly female, is that virtually all of them have a history of early sexual trauma. I think the sorts of tissue injury associated with normal aging cause pain and fatigue in these patients because they are under a constant cognitive overload similar to that created experimentally by Najmi and Wegner using semantic priming.³⁰ A brain-mind not constantly attempting to suppress concepts and memories can learn to "turn-off" signals from pain neurons. This is consistent with the impressions of John Sarno, who has seen thousands of patients with back pain, that physical treatments for somatoform illnesses are usually useless.³¹

There has been a well-documented historical change in presentations of functional somatoform illnesses.³² With new imaging technologies such as MRI, doctors can see, for example, that "there is nothing visibly wrong with your back." Patients have learned, in turn, to locate their pain in more arcane conceptual containers. In Freud's day, sexual abuse and other trauma victims might complain of not being able to move a limb or feel anything in it. Doctors learned over time that many of these sorts of symptom made no sense physiologically. Today, the victims of psychological trauma often report symptoms of fibromyalgia and chronic fatigue. No one, except perhaps Hakala and his colleagues, can find "fatigue" on an MRI.^{33, 34}

The medical community needs to provide a valid diagnostic container for these patients. A valid somatoform diagnosis works as a form of empathy and can help effect moderate

improvements in such a patient's condition. The hypochondriac with chronic pain is more likely helped by a valid somatoform diagnosis than by, for example, back surgery.

Today, we can often help patients to alter habits that are the proximal causes of the dysregulation of thought, feeling, expectations, and overt behavior. Awareness of these habits, which are derivatives of underlying conflict, is near the "top of mind." That is, these are not "deeply repressed" but rather "nearly conscious thoughts." Deep, foundational self-concepts are hard or maybe impossible to change. But basic self-concept change is often not necessary to relieve many kinds of mental suffering. Conflict at depth will continue to generate signal anxiety more or less regardless of alterations of habits relatively accessible to conscious awareness. But, remodeling the derivative habits and concepts can help regulate the anxiety.

Drugs, which act on the entire brain, provide relief for many patients, in part, by decreasing their reactivity to stress. Drugs do not alter the invalid self and non-self-concepts the patient uses habitually in futile attempts to resolve intrapsychic and interpersonal conflicts. But psychoactive drugs especially hallucinogens, in combination with talk therapy, may be of use in promoting changes in the habits used to activate particular concepts in awareness. The more usual psychotropic medicines have the well-known effect of making otherwise incapable patients amenable to talking therapies.

It is often difficult or impossible by means of talk alone to change deep structures and processes that are the distal causes of mental illnesses. Treatments such as EMDR,^{9, 35} hallucinogens,^{9,36} biofeedback,³⁷ and neurofeedback³⁸ can be effective therapies. They may work by somehow interfering with the person's strong habits to activate invalid concepts of reality. Such distorted concepts along with the habits to activate them are the proximal causes of incompetent thinking, painful feelings, and ineffective overt behaviors seen in mental illness.

The classical method of psychoanalysis usually is not fully effective at achieving its stated aim of altering psychological depth. Freud was essentially a research scientist and theorist. The psychoanalytic method of free association is an excellent way to learn about the mind. It never was a very effective therapy except for some patients. However, concepts held by individuals and organizations, especially Science, can evolve more or less over time.³⁷ Developments in neocortical conceptual systems are affected by thought processes just outside of awareness. The development of explicit, valid semantic concepts can promote increased competence to regulate subcortical processes contributing to anxiety disorders. Psychotherapy, and really all medical therapies, involve more or less enlisting patients help in learning about their bodies, their minds, and how they interact. The most effective psychotherapies will involve explicit communication with patients regarding their use of words, their overt social behavior, and contemporaneous measurement and feedback about changing levels of somatic and neural variables. It is likely that biofeedback and neurofeedback methods will be used increasingly in combination with talk and drug therapies.^{3, 37,38}

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