

## Borderline Personality Disorder

Borderline personality disorder (BPD) is one of the most common mental disorders, more frequent in females than in males. People afflicted by borderline personality disorder fail to establish their own identity and develop life plans. They are emotionally unbalanced and impulsive, have frequent temper tantrums, and are almost constantly angry. They have poor self-control and may spend more money than they can afford, buying things they don't need. They tend to go to extremes in their social relationships, shifting from great admiration to total rejection. They are often self-harmful, illogical, and paranoid. They have a low self-image, are frequently depressed, and fear loneliness but are unable to develop lasting relationships in marriage and career. People with BPD tend to be accident-prone and to be careless drivers, and they sometimes practice self-mutilation. They may indulge in petty crimes such as cheating and shoplifting. Usually underachievers, they are overdependent on and overdemanding of their friends and relatives, whom they try to manipulate. Many become drug and alcohol addicts, or have no self-discipline in eating. Many borderline patients threaten suicide; some of them are suicidal.

### *Etiology*

The borderline personality disorders are related to genetic predisposition. There is no clearly established hereditary transmission of this disorder, but most probably some individuals are born with a predisposition to poor stress tolerance and inadequate ability for self-control. Children with this kind of predisposition are extremely sensitive to parental attitudes. If the child's parents, especially the mother, act in a self-contradicting manner, shifting from overprotection, attachment, and affection to hateful and punitive behavior, the child develops feelings of overattachment and admiration for the mother, combined with frequent resentment and depression. The child is prevented from developing a persistent self-image and self-control, and is at the mercy of the accepting-rejecting mother.

### *Psychotherapy*

Therapists must be aware of these patients' continuous and unjustified angry moods, blaming of others for true or imaginary misery, lack of social relations, extreme fear of separation and loneliness, and self-defeating and self-mutilating behavior, all of which are symptoms of borderline personality disorder.

People afflicted with borderline personality disorder are difficult patients. They frequently regress, are very demanding and sometimes suicidal, an often elicit negative feelings in their psychotherapists.

Psychotherapy with borderline patients needs to be supportive and reality oriented, preventing regression and suicide attempts. Quite often psychotherapy with borderline patients becomes more guidance than therapy.

*Benjamin B. Wolman*

## Brain and Language

On the basis of observations made in the clinic, large portions of the central part of the cerebral cortex have been shown to be involved in the interpretation and expression of language in humans. In broad outlines, the relationship between a variety of brain systems and aspects of language has been reliably established. Nonetheless, many specifics of these relationships remain obscure due to individual differences and to incomplete knowledge.

Before the relationship between brain and language can be explored, it is necessary to define what is meant by language. Animals are often able to communicate fairly precise messages. Such communications have been referred to as language, e.g., the language of the bees or ape language. Also, though the term *language* is derived from the Latin root "lingua," referring to tongue, gestural sign language has been studied extensively, and comparisons have been made between such productions in apes and humans. On the other hand, linguists, whose domain is the study of human language, insist on a more restricted definition, in which the structure of the communication becomes the central interest.

Definition is important. Thus, if one is primarily concerned with communication or its loss due to

brain injury, one finds a region surrounding the sylvian fissure of the left hemisphere of the brain that, when damaged, results in communication difficulties. Some localization within this territory can be ascertained: toward the front of the region, difficulties are apt to be with expression; toward the rear, they are more likely to entail comprehension.

The linguist can refine these rather gross relations. Linguistic analysis shows that lesions in the anterior part of the region superior to the sylvian fissure are apt to produce difficulties in processing function words (words that make fluency possible in constructing sentences). By contrast, lesions of the posterior part of the region inferior to the sylvian fissure impair comprehension because of a loss in the ability to process content words (words that refer to objects and events).

Language as studied by linguists has other attributes: semantic, pragmatic, and syntactic. The semantic aspects are concerned with ostensive definitions: what utterances designate in the world of objects and events. Damage to the part of the cerebral cortex behind and above the sylvian fissure has been shown to impair the semantic aspects of language, leaving intact comprehension dependent on the internal meaning of utterances (e.g., "a knife is used to cut with" is understood, but when given the word and asked to select a picture of a knife, the patient is unable to make the connection).

The pragmatic aspects of language deal with rhetoric, with prosodics, and with the social effectiveness with which the language is used. The term *prosodics* refers to intonation and to pauses used for effectiveness. Intonation has been shown to be related to the right hemisphere; impaired expression anteriorly, and impaired comprehension posteriorly. Appropriate pausing appears to be processed by the left hemisphere, anteriorly, and is related to fluency and the use of function words.

The syntactic aspects of language are programmed by the centrally located region of the cerebral somatosensorymotor cortex that surrounds the Rolandic fissure. It is syntax that brings together the semantic and pragmatic aspects of language. Syntactic procedures provide the skill necessary to make language comprehensible and fluent.

All of the above is most applicable to ordinarily right-handed males raised in a culture of Indo-European languages. Left-handers may adhere to this scheme or may reverse or scramble hemispheric localization. Females suffering from strokes show more rapid and complete recovery, suggesting that their language processes are less restrictedly localized than those of males.

A persistent problem in localization has been delineating the location of the lesion responsible for expressive aphasia. Initially, Pierre Paul Broca pointed to the third frontal convolution of the left cerebral hemisphere, anterior to the localization of the representation of the tongue. However, an increasing number of patients with disturbances in fluency have been found whose left third frontal convolution is intact. Ordinarily, such patients can be shown to have a fairly deep lesion in the neighborhood of the third frontal convolution or somewhat more posteriorly, invading the territory of the tongue representation. Several possible explanations present themselves: expressive aphasia is due to (1) a combination of impaired regulation of tongue and throat movement (dysarthria) plus a more extensive frontal involvement in processing function words, leading to loss of fluency and rhetoric; (2) an involvement of the uncinate fasciculus, which connects the inferior part of the frontal lobe with the polar part of the temporal lobe, including the amygdala; or (3) critical involvement of the basal ganglia (head of the caudate nucleus, and/or the nucleus accumbens).

This particular problem is but one of many of this type. Thus, despite a good deal of knowledge regarding the relation of brain and behavior, serious gaps in knowledge remain. Emphasis has been placed by neurologists on "disconnection syndromes" to account for some of these gaps. The idea is that complex symptomatology is produced by disconnections between cortical areas, due to severing of corticocortical fiber tracts. In monkeys, however, even radical disconnections of corticocortical tracts produce remarkably few, if any, effects. By contrast, disconnecting the cortex from the basal ganglia results in dramatic difficulties, mirroring those obtained by extensive resections of that cortex. Sur-

prisingly disconnection from or destruction of relevant thalamic structures does not produce such an effect.

It may well be that effective corticocortical connections are what make human linguistic and other cultural processes possible. Nevertheless, it is worth considering that these processes rely on the relationship between the cerebral cortex and the basal ganglia. Explorations of the role of the basal ganglia (e.g., by electrical stimulation) in language have yet to be undertaken.

*Karl H. Pribram*

### Brain, Motivation, and Emotion

To understand the relation between brain systems and feelings and their expression, it is necessary to distinguish emotion from motivation. Emotions are to a large extent processes occurring within the organism, while motivations extend the relationship of the organism to its environment through intended or expressed action. Synonyms for *emotion* are *affect* and *feeling*. When emotions are expressed, they reflect the internal process by facial and other non-verbal designations or by the prosodics of language. Such expressions are used by organisms as signals to guide social intercourse.

By contrast, motivations initiate planned, intended action. Aggression (agonistic behavior) provides an example of the difference between emotion and motivation. Emotional aggression results from frustration. It is characterized by an outburst of poorly organized behavior, directed at whatever happens to be in the vicinity. Motivated aggression is carried out with consummate skill, as when a lioness stalks and succeeds in bringing down her prey. Similarly, emotional love is passionate; when expressed, it reflects an internal state of the lover. Motivated love is directed toward the well-being of the loved one. Romantic, passionate love resulted, during the period of the Crusades, in incarcerating the loved person in a tower and forcing her to wear a chastity belt! Today, passionate involvement often leads to frustration, anger, and occasional violence against the loved one. Better not to be the recipient of this

sort of extreme passionate love; rather, passion should be leavened with motivated caring and commitment.

The diencephalon of the brain contains two reciprocally acting regions. One centers on the ventromedial nucleus of the hypothalamus; the other is known as the far lateral hypothalamic region. Electrical stimulation of the region of the ventromedial nucleus produces a series of responses graded as a function of the amount of current in the stimulus. Mild stimulation produces alerting and the cessation of ongoing activity, including that of eating and drinking. The region has thus become known as critical to the orienting reaction and as a satiety center. More intense stimulation will produce signs of irritation and, in the extreme, "sham" rage, an example of aggression directed at whatever is close at hand.

The far lateral region of the hypothalamus is made up of fiber tracts and contains few nerve cells. Some of these tracts connect the amygdala with the ventromedial hypothalamic region. The amygdala is a basal ganglion, which has been shown to modulate ventromedially initiated orienting, satiety, and aggression.

By far the majority of fibers coursing through this lateral diencephalic region are tracts that connect the substantia nigra with the corpus striatum and globus pallidus. These connections mediate the dopaminergic activity of the basal ganglia involved in the control of posture and other attitudinal aspects regulating behavior. Here lie the neural substrates of motivation, the substrates of motivated aggression, love, and commitment. Unfortunately, as of now the details of the manner in which these motivational processes operate are not as carefully worked out as those that modulate emotions by the activity of the amygdala.

One of the clearest ways to understand the processes mediated by brain systems is to investigate, whenever possible, the sensory input to the system. With respect to the processes regulated by the amygdala, the modalities of pain and temperature have been found to be critical. In the spinal cord, the nerve fibers carrying pain and temperature sensation travel together in the ventral spinothalamic tract. However, only about one-third of these fibers

find their way directly to the thalamus. The remainder of the pain and temperature input reaches the region of the amygdala and surrounding cortex by way of the periaqueductal gray matter of the mesencephalon.

Pain comes in two distinct modes: (1) a sharp sensation localized in time and place, and (2) an aching sensation that seems to wax and wane and is difficult to locate. The fibers mediating the sharp sensation find their way to the parietal cortex via the dorsal thalamus; intractable aching is relieved by orbitofrontal lobotomy, which disrupts its uncinate connections to the amygdala.

Temperature discrimination has a similar dual relationship. Only very fine temperature discriminations have been shown to be disrupted by parietal lobe resections. For the most part, disruption of temperature sensibility occurs when the amygdala system is stimulated electrically or is excised.

From this analysis of the difference between sensory input to the parietal convexity and that of the amygdala system and its connections, a distinction between an epicritic and a protopathic aspect of somatic sensation can be drawn. Epicritic sensations show local sign; they can be precisely located in time and space. Protopathic (the term is related to the Greek *pathos*, from which *pathological*, as begetting compassion, is derived) sensations provide hedonic tone. The hedonic tone of pain is aching discomfort; that of temperature is comfort. Comfort reflects normally operating metabolism, which is anchored, in warm-blooded animals, by basal temperature.

The results of lobotomy indicate that modulation of the pain/temperature process involves higher-order regulation of the amygdala system. In addition to the orbital part of the frontal lobe, its dorsal part, through connections with the cingulate gyrus and thus the hippocampal system, has been shown to play an important role in mediating between emotional and motivational processes. Motivations are regulated via connections with the striatum. Mediation takes effort and prevents the hedonic process from becoming hung up in passion or in blind commitment.

In summary, by distinguishing emotions from motivations and both from epicritic processes, brain

systems regulating the hedonic foundations of experience and behavior have been identified.

*Karl H. Pribram*

### **Brentano, Franz Clemens (1838–1917)**

Brentano's work encompasses several areas in philosophy and psychology; he defines psychology as the "science of the soul." The act of perceiving, not the content of what is perceived, is the subject matter of Brentano's psychological system.

*Benjamin B. Wolman*

### **Breuer, Josef (1842–1925)**

An Austrian physician and physiologist whose work was a precursor to Freudian psychoanalysis, Breuer developed the cathartic treatment method, based on suggestion and hypnosis. Breuer and Sigmund Freud believed that "hysterics suffer mainly from reminiscences." A psychological trauma may lead to a discharge of energy, whereas hysteria blocks discharge. The accumulation of the blocked mental energy, which causes hysterical symptoms, must be unblocked and discharged. Hypnosis enables unblocking, and a release called *catharsis* restores mental health. Breuer treated a young woman with serious hysterical symptoms by encouraging her to talk freely in an autohypnotic state. Freud compared the cathartic method to an incision and drainage of an abscess; the open pathway permitted the discharge of accumulated energy and a cure.

*Benjamin B. Wolman*

### **Brigham, Amariah (1798–1849)**

Brigham was one of the thirteen founders of the American Psychiatric Association. In 1842, he organized and became head of the new State Lunatic Asylum in Utica, New York, where he put into practice mild and "moral" (psychological and milieu) therapy. Brigham was an advocate of phrenology.

*John C. Burnham*