Handbook of Clinical Neurology, Vol. 139 (3rd series)
Functional Neurologic Disorders
M. Hallett, J. Stone, and A. Carson, Editors
http://dx.doi.org/10.1016/B978-0-12-801772-2.00010-2

Chapter 10

Psychologic theories in functional neurologic disorders

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Abstract

In this chapter we review key psychologic theories that have been mooted as possible explanations for the etiology of functional neurologic symptoms, conversion disorder, and hysteria. We cover Freudian psychoanalysis and later object relations and attachment theories, social theories, illness behavior, classic and operant conditioning, social learning theory, self-regulation theory, cognitive-behavioral theories, and mindfulness. Dissociation and modern cognitive neuroscience theories are covered in other chapters in this series and, although of central importance, are omitted from this chapter. Our aim is an overview with the emphasis on breadth of coverage rather than depth.

INTRODUCTION

In this chapter we aim to provide a brief synopsis of the main psychologic and social theories that are described in the context of the study of functional neurologic disorder. This chapter is primarily aimed at clinicians with an interest in functional symptoms but without expert knowledge of these fields. We cover psychodynamic theories, learning theories, cognitive-behavioral theory, the sick role, illness behavior, and diagnostic operationalization. The descriptions are unashamedly a crib for the uncertain: the expert will find nothing new and perhaps only gain a sense of frustration that he or she could have described the terms better. Dissociation (including the work of Janet) and modern cognitive neuroscience theories are dealt with elsewhere in the book and are omitted.

PSYCHODYNAMIC THEORIES

Early psychodynamic theories were led by the ideas and writings of Sigmund Freud. He had a dominant personality and it may be no coincidence that his biographer Stafford-Clark (1967) describes Freud's early ambition as being a great general, like Hannibal. From the beginning there was a quasi-religious atmosphere to the development of his theories and early followers were invited to his Wednesday Club, where his was "the first and last word" (Freud, in a letter to Fleiss: quoted by Stafford-Clark, 1967).

The key tenet of Freudian therapy was that humans had a range of distressing or guilt-inducing thoughts and memories that were repressed and inaccessible to normal conscious thought but the associated emotions could still exert a psychic influence. In essence, what was being said was, that which cannot be remembered cannot be emotionally forgotten. The role of therapy was to bring both the thought and, critically, the feeling into the patient's conscious awareness. The notion, although in some ways originally expressed, was not dissimilar from previous theories of some form of driving forces present in the brain, often described as the passions, which in turn borrowed heavily on ideas of Galenic spirits and Newtonian mechanics.

Freud initially used hypnosis to try to release these repressed thoughts, but his breakthrough moment, described along with Joesph Breuer in *Studies on Hysteria*, was when he realized that talking alone could produce the same results. Initially he pressed his hand heavily on the patient's forehead but that too was soon forgotten – talking alone was enough. The classic vision

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is the patient lying on the couch staring into space with little to interfere with her flow of thought, but early psychoanalytic sessions were just as likely to happen on a long walk through the Viennese woods. The very airing of the thoughts and the experiencing of the emotions were held to have a cathartic effect. As Freud developed his theories, the discussion and interpretation of dreams, then free association, in which patients let their mind wander, reporting all thoughts regardless of triviality or sense of guilt or shame, became key techniques. With specific regard to hysteria:

> *the causal relation between the determining psychical trauma [trauma is taken from the Greek for wound] and the hysterical phenomenon is not of a kind implying that the trauma merely acts as an agent provocateur in releasing the symptom, which thereafter leads an independent existence. We must presume rather that the psychical trauma – or more precisely the memory of the trauma – acts like a foreign body which long after its entry must continue to be regarded as an agent that is still at work; and we find the evidence for this in a highly remarkable phenomenon which at the same time lends an important practical interest to our findings.*
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> *For we found, to our great surprise at first, that each individual hysterical symptom immediately and permanently disappeared when we had succeeded in bringing clearly to light the memory of the event by which it was provoked and in arousing its accompanying affect, and when the patient had described that event in the greatest possible detail and had put the affect into words. Recollection without affect almost invariably produces no result (Breuer and Freud, preliminary communication, 1955).*

Central to this theory was the notion of the twin concepts of repression and resistance: "that the hysterical patient's 'not knowing' was in fact 'a not wanting to know' – a not wanting which might be to a greater or lesser extent conscious" (Breuer and Freud, 1955).

The role of therapy was: "by means of my psychical work I had to overcome a psychical force in patients which was opposed to the pathogenic ideas becoming conscious (being remembered)" (Breuer and Freud, 1955).

Freud acknowledged that at this stage "I cannot, I must confess, give any hint of how a conversion of this kind is brought about." However, in the preface to the second edition 10 years later, he commented that the "attentive reader will be able to detect in the present book the germs of all that has since been added to the theory of catharsis: for instance, the part played by psychosexual factors and infantilism, the importance of dreams and of unconscious symbolism" (Breuer and Freud, 1955).

However, Freud himself recognized the limitations of the treatment, if not the theory:

> *I do not maintain that I have actually got rid of all the hysterical symptoms that I have undertaken to influence by the cathartic method. But it is my opinion that the obstacles have lain in the personal circumstances of the patients and have not been due to any question of the theory (Breuer and Freud, 1955).*
>
> *I am justified in leaving these unsuccessful cases out of account in arriving at judgment, just as a surgeon disregards cases of death which occur under anaesthesia, owing to post-operational haemorrhage, accidental sepsis, etc. (Breuer and Freud, 1955).*

The further caution is added that treatment is for the actual functional symptom only and not the underlying predisposition. Furthermore, Freud felt that on a personal level he would be unable to treat anyone "who struck me as low-minded and repellent" and "the treatment not applicable at all below a certain level of intelligence." It should be highlighted that all the modern psychodynamic therapists known to the authors would completely reject these latter statements and find them offensive. However, both comments highlight ongoing debates that are current. Advocates of dynamic psychotherapy often differ from Freud himself and claim that intrinsically the treatment treats the underlying cause of the problem, not "just the symptoms." Critics would claim, on the basis of empiric evidence, that there is a bias in access to therapy towards the young, well educated, and Caucasian (Mind Report, 2013).

Although Freud always acknowledged that there would be neurobiologic underpinnings for his theories, he did not regard it, quite reasonably, as his role to uncover them. He concentrated instead on describing psychologic models. Although viewed as a criticism by some, it is worth noting this is no different from the approach of modern cognitive neuroscience, and if Freud had had access to functional magnetic resonance imaging and magnetoencephalography, his own approach to testing theories, at least in the early stages of his work, may well have been quite different. Among his core theories were:

- The topographic model: Freud's original psychologic model divided our psychologic structure into three areas: the unconscious, preconscious, and conscious. Although not actually articulated in the original *Studies on Hysteria* one can see it is based on this

conceptual approach and remains the one most readily recognizable to clinicians today (Freud, 1953–1957, vol. XV).

- The structural model: on top of the topographic model was placed the structural model of id, ego, and superego. Freud himself did not use these terms but wrote of the "das Es," "das Ich," and "das Über-Ich": "the It," "the I," and "I above." The subsequent change to Latin was by his translator James Strachey. The "it" was the original drive state seen in the new infant and ungoverned by any awareness other than its own needs. From Freud's perspective it worked on the "pleasure principle," or the immediate gratification of its own needs and desire without concern for the consequences. Critically, in this state contrary impulses can exist side by side. The "I" brings with it socialization and the "reality principle." It works to delay the immediate impulse for gratification of needs in favor of a view of long-term benefit. The "I" allows the human to live and function in the real world where giving way solely to the "it" would lead to grief; the "it" contains the passions whereas the "I" judgment and common sense (Freud, 1953–1957, vol. XIV).
- The "I above" represents a more idealized, self-policing version of rules and cultural norms, viewed as an internalization of parental guidance. The "I" in Freud's model had to serve three masters – the passions of the "it," the rules of the "I above," and the real world – and still keep the person free from distress or anxiety. To assist it in this thankless task it employed a range of subterfuge and tricks to distort reality, known as defense mechanisms: denial, displacement, intellectualization, fantasy, compensation, projection, rationalization, reaction formation, regression, repression, and sublimation.

These structures were not mutually exclusive and compartmentalized but rather ran seamlessly into each other. Similarly, in the overlap with the topographic model, although the "it" was predominantly unconscious and the "I" conscious, the components of the structural model may exist in the conscious or the unconscious mind.

Transference and countertransference

The concept of transference was initially viewed by Freud as an impediment to the therapeutic process but was subsequently seen as a key tool in gaining an understanding of unconscious processes. Transference occurred when patients imbued in their doctor or therapist ideas, traits, or characteristics that were not based on the doctor's behavior but rather were unconscious representations of previous experiences or expectations, in turn often based on their relationships with their parents. Countertransference is the reverse, when the doctor/therapist imbues in the patient ideas, thoughts, or behaviors that relate to his or her own needs and desires. Arguably, these two concepts are ones that all doctors practicing in this area need to be most aware of. One can make sense of many failed doctor–patient relationships and the opposite, many heroic yet doomed attempts at, particularly surgical, treatment, through such a lens (Rycroft, 1995; Gay, 2006).

Primary and secondary gain

The primary gain was the development of the hysterical physic symptom which acted as a psychologic defense against these internal psychologic conflicts. The physical symptom in some way assisted in keeping the repressed thoughts or emotions repressed by allowing the dissipation of psychic energy. This was seen as the primary gain and is the origin of the term conversion. Of note, this does not mean that the patient cannot be externally distressed, anxious, or depressed, but refers solely to control of unconscious conflicts. Secondary gain, which can be either conscious or unconscious, refers to the external or material advantages of being ill, such as avoidance of some unwanted task or financial gain, and can apply across any illness (Rycroft, 1995; Gay, 2006).

Sexual theories

Freud initially postulated the seduction theory – that infantile sexual molestation caused such traumatic repressed memories that this was the main cause of adult hysterical neurosis (McCullough, 2001). Initially he presented no data to support the notion; it has been suggested that he felt, perhaps not unreasonably, that the notion may be too repellent for people to believe, although why he thought a lack of data would assist is unclear. In fact, the idea was not new and Paul Briquet, in his landmark monograph on hysteria, arguably the first case-control study in psychiatry, had conclusively demonstrated some 10 years earlier an association between sexual abuse and the development of hysteric symptoms (Carson and Stone, 2015). Freud however quickly became increasingly concerned by the theory. He viewed hysteric symptoms as increasingly common and held that such widespread perversions against children were unlikely. He replaced the original theory with one of infantile sexuality and phantasy (note in psychoanalytic speak that phantasies refer to infants' view of the world and fantasies normal daydreams). In this he felt that the repressed ideas of sexual molestation had their origins in

fantasies, not reality. This led on to the idea of normal infant development passing through stages of oral, anal, phallic, latent, and genital stages, where the "it's" source of pleasure was derived primarily from stimulation of these regions, usually via normal processes such as eating and learning to defecate. Development could be arrested or corrupted.

From this model arose the now famous notion of the Oedipal complex (Rycroft, 1995). This occurs during the phallic stage of development, where the child develops a competitive relationship for one parent with the opposite-sex parent. It is resolved when the child identifies with the same-sex parent, incorporating that parent's image and values into his/her "I above." Within this lies the idea of choice: that the child has chosen to learn and accepts the benefit of abiding by values for both him/herself and the common good. By contrast, a failure to do so results in a pseudocompliance driven solely from a fear of punishment that results in an internal sense of distress and anguish.

The abandonment of the seduction theory has led to considerable, and justifiable, criticism and left a difficult legacy of many victims of molestation having the reality of the ordeal being denied (Masson, 1984). This is a difficult area and even today many of Freud's devoted followers struggle to acknowledge its consequences. At the time Freud was moving from a theory of hysteria as a synonym for a functional neurologic symptom to theory of general psychic distress, and to suggest that all psychic distress was secondary to child sexual abuse would be as ludicrous now as it seemed then. The lesson was, and it remains a valuable one today, that there may be more than one etiology behind common and varied phenomena; but Freud too needed to remember that (McCullough, 2001).

It is also unclear to what extent Freud's immediate colleagues genuinely believed these theories. Freud himself expressed his frustrations at this.

> *Not long ago Breuer made a big speech about me at the Doktorenkollegium, in which he announced his conversion to belief in the sexual aetiology. When I took him on one side to thank him for it, he destroyed my pleasure by saying: 'All the same I don't believe it.' Can you understand that? I can't (Freud in a letter to Fleiss, quoted in Stafford-Clark, 1967).*

It can be difficult to gauge whether these ideas had much of an impact on contemporary mainstream neurologic practice, even though the experience of treatment of shellshock in World War I was associated with universal acceptance and sophisticated understanding of the role of psychologic factors in the creation and maintenance of hysteric symptoms.

Symbolism

Symbolism, of all the Freudian theories, is perhaps the most widely recognized by the general public but unfortunately the hardest to nail down as to what was actually said or meant. It did not feature in his early work in the *Studies on Hysteria* but began to be articulated in the context of the interpretation of dreams. Dreams were viewed by Freud as a means of unlocking the closed world of the unconscious and in that context symbols were seen as a means of decoding the content of the dreams. As Freud developed his ideas over the course of his career, he became more interested in the use of symbols as a form of phylogentic inheritance, a universal language shared by all humans, as evidenced by a universal understanding and similarity of art and folk wisdom.

Whilst there is little doubt that there is a shared semiotic that is transcultural, it is difficult to know whether at the phantasy level Freud's ideas of a universal symbolism are true – does fear of beheading really represent fear of castration or is having one's head cut off scary in its own right? Part of the problem is that Freud's ideas are now so universal that the semiotic of a cigar as a phallus is generally held: but was it always thus?

With regard to hysteric symptoms, Freud's use of hysteria from a state of a conversion disorder as we would currently understand the condition to a more generalized neurotic state without the need for a physical symptom makes it hard to know exactly where symbolism fitted into his views on the formation of what we would now call a functional neurologic symptom. His immediate followers, most infamously Ferenczi, would relate it to a mix of sexual phantasies and fantasies; thus the woman with globus had a secret fear of fellatio – an idea widely and justly ridiculed. In the modern era therapists will often enthusiastically quote symbolism in a fairly direct way as involving a symbolic representation of the underlying psychologic fear in the display of the physical symptom as part of an illness "narrative." Thus the abused woman harboring repressed fantasies of stabbing her husband may develop a paralysis of her dominant arm. There is no scientific support for these notions but they are largely untestable owing to the very nature of symbolism as a symbol.

Object relations theory and attachment theory

After Freud's death, whilst the Second World War raged in Europe, a different war was raging in West London. A protracted and acrimonious series of scientific meetings were taking place at the British Psychoanalytical Society, the "controversial discussions," between the Viennese school led by Freud's daughter Anna, the

supporters of Melanie Klein, and the Middle Group, later to be known as the Independent Group; at stake was the future direction of psychoanalysis. An uncomfortable tripartite approach was the outcome, the legacy of which was Anna Freud's theories holding particular influence in the USA, Klein in South America, and the Independents in the UK. For mainstream current medical practice it is perhaps the ideas arising from this Independent Group that survive to the current day, with Klein and both Freuds largely historic figures. The ideologic stance of the Independents was to not be constrained by ideology, but rather to use what worked.

Arguably, the key figure for modern psychodynamic theory was the relatively unknown Edinburgh analyst Ronald Fairbairn. Fairbairn was the first to wholly and publicly break with Freud's notion that the primary drive or libido of humans was the pleasure principle; in Fairbairn's view it was to form relationships to other humans. He gave the original description and coined the phrase object relations theory. The process started in infancy with the infant's attachment to his/her parents. The quality of the attachment formed to the parents was so strong and fundamental that it would shape the quality of future relationships throughout the lifespan. These relationships were internalized and formed a prototype for future relationships. This internalization was what Fairbairn referred to as "internal objects" – i.e., a relationship that existed in the person's thoughts. For the early infant it was not possible to initially tell who was doing what or to have a fully integrated view and the infant would relate to part objects – i.e., was the mother that fed the child the same mother who withheld food when it was desired in these early days? However, this realization that the part objects were one and the same person came with early maturation.

For those who had a healthy relationship with parents this would lead to a normal pattern of looking outwards and forming healthy relationships with real people or external objects that could fulfill a person's needs. By contrast, when the parental experience was poor and the parents unavailable to provide appropriate nurture and support, the child struggled to deal with this. He or she would solve it by simply accepting the responsive part of the parents as being real and a good object and internalize the unresponsive "unsatisfying object" as part of him- or herself. This was known as "splitting," where at a fantasy level the good and bad parts of the parental figures were kept separate and thus controlled, rather than dealing with the distressing problem of ambivalent feelings and recognition of good and bad points in the one person. At its worst, this process can be seen in abuse victims who carry the blame themselves for all that happened – what Fairbairn described as a "moral defence"; the idea being that this allowed them to perpetuate the inner fantasy that they had loving, nurturing parents.

From this came the acceptance that parents did not have to be infallible but simply "goodenough" – the oft-quoted phrase of Donald Winnicott, the unofficial leader of the Independent Group. Winnicott held that "the foundations of health are laid down by the ordinary mother in her ordinary loving care of her own baby." Often described as theoretically elusive, Winnicott spoke of a "true self" and a "false self"; the idea of sense of self being complex or, as Winnicott said, "a word like self…knows more than we do." The true self is a free-feeling, internal state, creative and alive. The false self is a public face made for acceptance. In an ordinarily healthy person the two will still coexist but their goals and values will be closely enough aligned that they will have no adverse effects. By contrast with poor early experience, the need to adopt an ever greater false self as a protection will be such that it dominates and smothers the true self, leaving a person feeling dead inside or "phoney" (Rodman, 2003).

Another member of this group, John Bowlby, emphasized the central role of attachment to this process (Bowlby, 1951). Attachment took place between infants and adults who were able to be sensitive to their need for social interaction and comfort. The infant, when dealing with any difficult, novel, or stressful situation, was viewed seeking a reduction in distress by being close to the adult. This was referred to as "proximity seeking" for the "attachment figure." It was considered to be an evolutionary protective mechanism. The key period for developing such attachment was between 6 months and 2 years. The adult's responses would be processed by the infant and developed into "internal working models" that would form the basis of attachment and emotions for future relationships. Infants would develop internal models to guide both their own behavior but also their expectation of the behavior of others. Unlike Freudian ideas, these theories have been subject to empiric and rigorous scientific research, both in humans and animal models, and whilst not all aspects of the theories can be tested, the basic tenet of the central and core need for attachment for human emotional development has been undeniably confirmed.

What has not been tested empirically, and remains a hypothesis, is how much, if at all, this maps on to functional symptoms. Fairbairn (1944) viewed the concepts of hysteria as being discovered by Janet with his description of dissociation. Fairbairn modified Janet's theories in line with his own theories of object relations psychology. In all of these theories, hysteric or conversion symptoms arose as a means of coping with the distress caused by interpersonal problems. As Fairbairn put it:

> *Hysterical conversion is of course a defensive technique – one designed to prevent the conscious emergence of emotional conflicts involving object-relationships. Its essential and distinctive feature is the substitution of a bodily state for a personal problem; and this substitution enables the personal problem as such to be ignored. All personal problems are basically problems involving personal relationships with significant objects; and the objects involved in the conflicts of the hysteric are essentially internal objects – and more specifically the exciting and frustrating objects (Fairbairn, 1954).*

Although a generalization, in the second half of the 20th century the psychoanalytic movement did not really appear to think of hysteria or functional neurologic symptoms from the perspective that we use in this book of a physical symptom to be explained, but rather as a psychologic mindset which may or may not be associated with a physical symptom. The result can often be a sense of comparing apples and oranges.

The social model

The 20th century was not solely about psychoanalysis. The discipline of sociology was also postulating important theoretic inroads. Foremost among them was Talcott Parsons' *The Social System* (1951). Parsons was an unapologetic theorist who conducted little empiric research, although he did not dismiss it. He was clearly influenced by the contemporary zeitgeist of psychoanalysis, but he thought that individual dynamic insights were of little value if viewed without the context of the wider social structures in which they were made. Parsons' primary consideration was what it meant to be sick. It should be noted he was not thinking specifically of functional disorders but of all ill health in general. He considered it inappropriate to be thinking of sickness in terms of "a condition" described by (psycho)pathophysiology; rather, it was a "prescribed role" that had a range of cultural rules and expectations and could not be considered without reference to this wider context. He argued that the test was "the existence of a set of institutionalized expectations and the corresponding sentiments and sanctions" (Parsons, 1951).

There were four aspects to the institutionalized expectation system relative to the sick role. First, the sick individual was exempt from his or her normal social responsibilities to a nature and extent relative to the degree of illness severity. This required legitimization and that came from a physician, who was thus placed in the role of arbiter. This was clearly a protection against "malingering" at a societal level. Second, the sick person could not be expected to get better simply by "pulling himself together", it was critical that the illness was due to "a condition," not an "attitude." Third, the sick person had to want to get better, and fourth, s/he had an obligation to seek "technically competent" help (Parsons, 1951). Parsons argued that, defined in this way, the sick role became the object of significant secondary gain, which the patient could be unconsciously motivated to secure. The problem for functional neurologic disorders was one of legitimization – symptoms could not be defined, nor accurately separated from malingering, except on a basis of trust. The sick role offered an explanation of the subjective overwhelming need in patients for a legitimizing diagnosis, as well as explaining a punitive attitude held by some doctors and society at large.

It also offers an interesting insight into doctors' responses to those who don't fit into the pre-prescribed roles. In discussing unnecessary surgery, Parsons quotes the ideas of Malinowski:

> *a pseudo-scientific element in the technical competence of the medical profession which is more than simply an expression of the relative lack of scientific development of the field; it is positively motivated…cluster about situations where there is an important uncertainty factor and where there are strong emotional interests in the success of the action…[such as]…gardening and deep sea fishing…[this form of] pseudo-science is the functional equivalent of magic in the modern medical field…it is to bolster the self-confidence of actors [surgeons] in situations where energy and skill do make a difference but because of uncertainty factors, outcome cannot be guaranteed. This suits both participants, i.e. doctor and patient (Parsons, 1951).*

ILLNESS BEHAVIOR

Further sociologic understanding of illness came from the work of David Mechanic. Mechanic had been stimulated by the work of Koos (1954), *The Health of Regionville*. Koos described the views on health of 500 families in a small American town. He made the striking discovery that people experienced many more symptoms than they presented to doctors with. That may seem rather obvious, but at the time it represented a radical challenge to the pathoanatomic medicine of the 19th and early 20th century (Armstrong, 1986). Mechanic attempted to explain this phenomenon in terms of illness behavior, which he defined as "the way in which given symptoms may be differentially perceived, evaluated and acted upon (or not acted upon) by different kinds of person" (Mechanic, 1962). Illness behavior could

therefore be influenced by cultural, social, or sex-role expectations or may be subject to variation as a result of previous illness experiences, situational factors, or adaptive needs. The key factor was that different people would react differently to the same pathology, as a result of a diverse array of psychologic and social variables (Mechanic, 1977). It also offered a patient-centered view, and as such one that was directly applicable, rather than the societal-level view of the sick role which necessitated the reactions of others. Although the theory was predominantly centered around pathologic disease processes, it still influenced a significant shift from analytic thinking as it allowed, and validated, the patient's thoughts and previous experience rather than consigning them to unconscious sources of trauma.

ABNORMAL ILLNESS BEHAVIOR

Pilowsky (1969) recognized that, although Mechanic's theory was intended to be universal, the main concern was, in reality, the underreporting of symptoms. Pilowsky, through his interest in functional symptoms, was by contrast more concerned with those who overreported symptoms. Borrowing from Mechanic, he felt such patients may be best described as having abnormal illness behavior. Implicit within this definition lies the idea that functional symptoms could have a heterogeneous etiology. Pilowsky, himself, recommended physicians inquire into the nature of the somatic component of patients' symptoms, but also their ideation and affect, their attitude to others, their motivations, and any relevant cultural factors in order to understand the presentation. One potentially useful, but scientifically difficult, aspect of this concept was that it allowed for coexistence of both somatoform symptoms and pathologic disease.

Some have criticized this model as paternalistic and making a social judgment. This is articulated by Armstrong (1986), who criticizes these models for assuming that the doctor is at the rational center, and it is with the patient that the "problem" lies; rather than the limitations of medical theory and practice.

> *Put simply it is not the illness which brings the patient to see the doctor but the theory…Abnormal illness behaviour was invented to cope with a problem, namely symptoms without disease, which was medically incomprehensible. But is it patient behaviour which is "abnormal", "maladaptive", or just plain wrong, or is it medical theory itself which cannot adequately account for the phenomena it observes? Why is it that doctors react with such strong emotion, "hostility", or feeling hunted, to patients with symptoms but without an organic lesion? Is it not the doctor's response which is abnormal? (Armstrong, 1986).*

DIAGNOSTIC OPERATIONALIZATION

The psychodynamic school of thinking held influence over psychiatry through the first half of the 20th century. The idea of diagnoses drifted, judgments were made on patients on the basis of an individual analysis of the psychologic processes, which effectively allowed clinicians to describe someone as having a disease if they thought the person showed evidence of such thought processes. This mode of assessment became so extreme at one stage that one could have functional symptoms without actually having any physical complaints but just by thinking in the manner of someone who might.

To Samuel Guze, a psychiatrist in St. Louis, however, this was nonsensical and, one suspects, intolerable. He practiced psychiatry from the perspective of his background medical training looking for features of commonality between individual clinical presentations. In his seminal paper (Guze, 1967), he outlined his view that psychiatric diagnosis could be described by operationalized criteria according to the following underlying principles. He thought that a reliable and valid classification was the essential foundation for communication, teaching, comparison, and evaluation. He set out to describe this approach using hysteria as a model (Carson and Stone, 2015).

> *The diagnosis of a functional psychiatric illness may be considered if the patients do not develop features of a different illness, if they have a similar course, and if an increased prevalence of the same disorder is encountered among their relatives (Guze, 1967).*

This seemingly obvious approach was considered heretic when the dominant view of psychiatric disorder was of a highly idiosyncratic reaction to the particular circumstances of an individual's life. His group proposed a definition based solely on observed clinical features of multiple unexplained symptomatology: a minimum of 25 symptoms, including at least one neurologic symptom, distributed across a range of body systems with onset before age 35 without imposing any etiologic framework. They demonstrated that such diagnoses could be made accurately between clinicians and were stable over time. They found a familial aggregation and noted an association with antisocial personality disorder in familial clusters. They paid homage to Briquet's influential work and named the disorder after him.

The classification proposed by Guze has remained reliable but it is now recognized that "Briquet's syndrome" is a relatively rare and severe form of presentation of somatoform symptoms occurring in only 0.1–0.2% of the population, compared to a

general-population prevalence of somatoform symptoms of 5–15%, depending on what definition is used.

The importance of Guze's contribution to the field was less his actual definition of Briquet's syndrome but more the underlying principle of his approach that patients could be objectively measured in terms of the presenting symptoms and clustered into groups in a meaningful way to allow quantitative measurement: a head-on collision with the psychodynamic zeitgeist of the era.

The influence of Guze's work extended far beyond functional symptoms and has come to dominate psychiatric practice. The methods he laid out for an operationalized approach to psychiatric diagnosis changed the landscape, and along with similar work he subsequently conducted on schizophrenia, and the UK–US diagnostic study on schizophrenia based on the same methods, led directly to *Diagnostic and Statistical Manual of Mental Disorders,* 3rd edition (DSM-III: American Psychiatric Association, 1980) and a whole new, and improved, era of psychiatric diagnosis.

Guze's influence on operationalized diagnosis for functional symptoms remains into the current revisions of DSM-5 (American Psychiatric Association, 2000).

LEARNING THEORIES

The mechanisms of how learning occurs are not only key to the understanding of human behavior in general, but also give insight into the ways in which maladaptive behaviors are established and with that an essential starting point for psychotherapy. The basic learning theories are briefly presented here. Their implications for cognitive-behavioral therapy (CBT), particularly in patients with functional neurologic symptoms, are discussed further below. A more detailed discussion can be found in Lieberman (2012).

Despite the ongoing debate on the extent of determinism versus free will, one of the basic assumptions in learning theory is that behavior is predictable and governed by biologic laws. In the 17th century, Descartes provided one of the first detailed physiologic explanations for human behavior, when proposing that reflexes are the basis for all automatic, involuntary reactions. His assumption that these reflexes were based on animal spirits flowing through the nerves was quickly falsified. However, he shaped the research that followed with his concept of the explicability of human behavior in a mechanistic way. The British Associationists, including John Locke, David Hume, and others, expanded on Descartes' ideas of movement based on association, but transferred this concept to mental processes. According to them, ideas are formed through the principle of association. When two sensations occurred together, they became associated and the strength of their association was assumed to depend on: (1) contiguity (how close in time are the events occurring together?); (2) frequency (how often are they occurring together?); and (3) intensity (how intense are the feelings that accompany these events?). These laws of association, postulated initially by Aristotle (≈300 BC), still provide the basis for modern learning theories. However, back then, these assumptions were solely based on introspection, and lacked an objective method for verification (Lieberman, 2012).

Classic conditioning

Almost two centuries later, Ivan Pavlov discovered, during his research on the physiology of the digestive system of dogs, an important objectifiable mechanism of learning, namely classic conditioning. He observed that dogs not only salivated when food was presented to them, but also in other specific and related situations, such as when the regular feeder entered the room. Salivation was found by Pavlov to be an automatic, reflexive response that is normally elicited by contact of the mouth with food. That this response could apparently be evoked also by other stimuli, and the notion that there must be an underlying law to predict this behavior, was fascinating to him and led to a number of experimental investigations, using physiologic methods in a highly controlled laboratory environment in order to understand this psychologic phenomenon. In the typical experiment a dog learns to salivate solely by the sound of a bell which was previously presented together with food. Before this association has been formed, salivation is the only reflexive response towards the presentation of food. Therefore, the presentation of food acts as an unconditioned stimulus (US) causing salivation as its innate unconditioned response (UR). The sound of the bell, on the contrary, is initially a neutral stimulus (conditioned stimulus, CS) to the extent that it does not elicit salivation on its own and also does not suppress it either. The conditioning takes place when the tone is paired with the food in the course of the experiment. Gradually, the dog learns to respond to the CS with salivation. This response is the result of the conditioning that took place over a number of paired presentations of US and CS, and is called conditioned response (CR).

Such conditioning can occur over multiple exposures or during a single event if the experience is sufficiently aversive. Many of us will have experienced single-event aversive conditioning during a bout of food poisoning. When we are re-exposed to the food we associate with our episode of sickness, we will often feel nauseated and unable to eat it. Of note, it does not have to be the food that actually caused the problem, but simply the food that the subject associates mentally with the

problem, often the most recent meal rather than necessarily the true culprit. Panic can be a potent cause/response of single-event conditioning.

In the maintenance/manifestation of dissociative (functional) seizures classic conditioning, mediated via panic as the CR, is suspected to yield a possible explanation in some patients. This hypothesis is supported by the two clinical experiences. One, the first seizure experienced is often more typical of a simple faint, but occurring in a situation that may have been paired with agoraphobic anxieties, i.e., a busy bar or similar. The second observation is that many subsequent seizures occur without an identifiable warning or an obvious trigger. In those cases the seizures are assumed to be triggered by slight emotional fluctuations or neutral stimuli through conditioning mediated by panic (Roberts and Reuber, 2014). This would be in accordance with a finding by Reuber et al. (2011), who reported that more patients experience their seizures as always coming "out of the blue" than occurring due to emotional stress. In some patients with functional movement disorders a link to physical triggers is suggested. Pareés et al. (2014) found that 38% of those patients with a physical triggering event such as mild physical trauma also fulfilled the criteria for a panic attack at the time of the event. Given the role of the amygdala in fear conditioning (Hitchcock and Davis, 1986), the authors concluded that panic may be a potent conditioning factor in the development of the symptoms.

Operant conditioning

While Pavlov combined two stimuli in order to build an association, Thorndike postulated in his *Law of Effect* (1898, 1911) a mechanism of learning based on the contingency between a response and a stimulus. He basically showed how a specific response is learned/likely to recur if it produces a favorable outcome or satisfaction. This is termed reinforcement and was investigated within a number of experiments. Skinner, who was a learning theorist and very influential in animal learning research, developed the so-called Skinner box, in which the animal under testing could be presented with stimuli and then make choices and gain rewards. For example, when a red light shines if a lever is pressed, a food pellet is gained, but not if the lever is pressed in response to a green light (Schacter et al., 2011). Hence, once conditioned, the animal will manifest behavior (lever press) to the red light, but not to the green light. Operant conditioning in the case of functional symptoms will often concern steps taken to avoid the physical manifestations of anxiety. The subsequent avoidance paradoxically serves to promote and reinforce anxiety. Typical operant conditioning includes a fear of falls, leading to mobilizing only when holding on to furniture or walls, or agoraphobic-like symptoms where all physical symptoms come on shortly after leaving the house.

Conditioning, whether classic or operant, might in some cases contribute to the development and maintenance of functional symptoms, and should then be shared as one part of an explanatory model with the patient. Clearly, this does not yield a full etiologic explanation. Behavioral conceptualizations with a too-narrow view may potentially be even harmful or offending when emphasis is placed on reinforcement of sick-role behavior. However, knowledge and use of these learning concepts as part of a broader treatment are likely to be beneficial in the treatment of functional symptoms, such as the extinction of maladaptive behaviors promoting alternative responses to warning signals and also changing behavior and cognitions that perpetuate the symptoms (such as agoraphobic avoidance (Goldstein and Mellers, 2006) and negative thoughts (Goldstein et al., 2015)).

The role of operant conditioning factors in the development, maintenance, but also in the treatment of functional neurologic symptoms has been discussed by several authors. Viewed purely as operational conditioning it is quite rare but it is more common as an integrated part of CBT, described below. A "controlled" single-subject design study was presented by Mizes back in 1985, describing the use of contingent reinforcement in the treatment of a young patient with functional weakness. Behavioral changes, such as gradually lifting the weak leg, were dependent on how powerful the rewards were. Facing the fact that gains were made initially but were not maintained, the author discusses potential harmful countereffects of social reinforcement of a sick role. Klonoff and Moore (1986) used monitored electromyogram signals as biofeedback in 2 functional motor patients in order to cause symptom change so that this could then be systematically reinforced. As well as the direct reinforcement of success on the biofeedback, further operant conditioning took place in that conversations which did not discuss symptoms were positively reinforced by praise and attention from the nursing staff and in a second phase by the parents as well. Both patients seem to have benefitted. These two studies demonstrate how operant conditioning has been used in this patient group; however, reviewing the literature indicates a lack of randomized controlled trials that would support this approach as an isolated treatment.

The concept of reinforcement has also been used as a treatment principle in physiotherapy in functional motor symptoms by a couple of studies, summarized in a systematic review on physiotherapy by Nielsen et al. (2013). The minimization of reinforcement of abnormal movement and maladaptive behaviors was eventually

incorporated by Nielsen et al. (2015) in their consensus recommendation for physiotherapy in functional symptoms. One can view reinforcement in this context as both the positive reinforcement of being ill, i.e., medical attendants or relatives paying more attention to someone who is more unwell and less attention as the person improves, and negative reinforcement, which is the removal of an unpleasant stimulus encouraging a maladaptive behavior, i.e., if the patient tries to mobilize he/she gets an increase in pain and anxiety, whereas by staying in bed this is avoided.

Social learning theory

While psychodynamic theories depicted behavior as a result of inner drives, behaviorists focused on the other extreme, eschewing inner causes and postulating that behavior is solely environmentally determined, denying any sort of power of self-direction. The social learning theory by Albert Bandura expands on these behaviorist concepts, but emphasizes cognition as the foundation of learning (Bandura, 1971). The internal processes which happen in a social context are considered crucial. According to the theory, learning therefore occurs not only through direct reinforcement but through observational learning when behavior is simply observed, and indirectly through observation of rewards and punishments (vicarious reinforcement). One of Bandura's most famous experiments investigated how children's behavior changes after they have watched an adult model acting aggressively towards a doll, depending on whether the adult model got punished, rewarded, or experienced no consequence for beating the doll.

Within the social learning theory and its emphasis on self-regulatory processes, Bandura also coined the term self-efficacy – a psychologic construct defined as belief in the ability to succeed in specific tasks or situations based on one's own competencies, even if facing obstacles. The locus of control is defined by the extent to which a person ascribes events and actions to internal factors (e.g., own behavior, characteristics) or to external factors (e.g., chance, other people). Great importance is attached to these concepts in health psychology as a determinant of health behavior and the strengthening of self-efficacy and an appropriate internal locus of control are often key elements of psychotherapy.

Cohen et al. (2014) found that distress and also the locus of control predicted higher levels of dissociative symptoms in patients with nonepileptic seizures with stronger perceived external control by others and a weaker perceived control by doctors being associated with higher levels of dissociation. Self-efficacy, despite being frequently discussed, had no predictive power in this particular study and has – to the knowledge of the authors – not been extensively researched in the context of functional symptoms. Stone et al. (2004) found that patients with nonepileptic seizures have a more external locus of control, experiencing seizures as unpredictable and out of their control, than those with epilepsy. Targeting beliefs about locus of control may therefore yield fruitful possibilities for psychotherapy in these patients. To a certain extent this is an essential component of any behavior change, whether or not one labels it formally as a locus of control.

Self-regulation theory

Following the belief that cognitions underlie human behavior, Leventhal and colleagues provided an influential theoretic framework which suggests that it is individuals' illness beliefs, in other words, their cognitive representation of the illness, that will influence the coping strategies applied and the appraisal of their efficacy (Cameron and Leventhal, 2003). Based on this theory the Illness Perception Questionnaire (IPQ) was developed, in which illness representations are assumed to be based on five distinct elements: identity (associated symptoms), cause, consequences (effects on life), timeline, and cure/control (Weinman et al., 1996). Discrepancy between the patient's health belief and the given health advice are likely to influence adherence to treatment and may present potential illness-perpetuating factors. Thus a patient may have a strong belief that he has a demyelinating illness as an explanation for functional paralysis and may have researched information on this on the internet; when a doctor says there is no neurologic disease, this fails to match with the patient's internal model and is rejected and the patient seeks further opinions or tests. However, if a doctor understands the components of why the patient has come to this conclusion based on asking about these five factors (Table 10.1) and can tailor her explanation of the complaint around the patient's constructs, but modifying them in the process, this may lead to a much more successful consultation, modification of the patient's underlying beliefs to accommodate this new information, and subsequent treatment adherence.

In patients with functional neurologic symptoms, illness beliefs are considered to play an important role (Sharpe et al., 2010; Edwards et al., 2012). Application of Leventhal's self-regulation theory to functional neurologic symptoms has been scarce but increased over the last years. One striking finding was that functional patients compared with equally disabling neurologic diseases (such as epilepsy or multiple sclerosis) often share quite similar beliefs about the impact of their illness, whereas functional patients are more likely to reject

Table 10.1

The common-sense model of illness regulation (after the work of Leventhal and Weinman)

Element	Cognition	Distortions
Identity	What are these symptoms?	Symptoms cause labels But labels also lead to the self-generation of symptoms
Cause	What caused these symptoms?	
Consequences	What effects will the symptoms have on my life?	Cog representations guide subsequent behaviour; i.e., if patients believe symptoms brought on by overactivity, they may engage in excessive rest which will exacerbate fatigue
Timeline	How long will the symptoms last?	
Cure and control	What will help make the symptoms better?	Change in symptoms provides feedback on coping strategies and may result in reappraisal of symptoms or adoption of maladaptive strategies, i.e., pain on activity leading to increased down time

psychologic factors as relevant to their illness (Stone et al., 2004, 2010; Ludwig et al., 2015). Further discrepancies in illness beliefs were found between nonepileptic seizure patients and their neurologists (Whitehead et al., 2013). The findings suggested a mismatch between the assumed cause of the illness as well as in regard to beliefs about the personal control.

Cognitive-behavioral therapy

CBT is a combination of concepts and techniques taken from cognitive and behavioral therapies. Behavioral therapy, developed originally from learning theory, suggests that how we behave depends on previous learned experiences and the processes of classic and operant conditioning. Therapy aims to relieve symptoms by changing behavior and the environmental factors that control behavior. By contrast, cognitive therapy aims to identify and modify patterns of negative automatic thinking. These approaches were combined into CBT in the 1960s and 1970s by Aaron T. Beck, who promoted the treatment and demonstrated efficacy for depression (Rush et al., 1977). The underlying idea was not, however, new: Stoic philosopher Epictetus recognized the link between events, thoughts, and emotions long before then, reportedly stating in the second century: "People are disturbed not by things, but by the view which they take of them."

The central idea of a person's percepts as a unique subjective experience was emphasized by Kant: "certain internal sensations which are not the expression of real disease cause nonetheless great anxiety about having one."

Kant went on to explain that humans have the characteristic of magnifying a sensation by concentrating upon it (Kant, 1800). This was formalized into a form of therapy based on rational persuasion developed by Swiss family physician Paul Dubois.

These central observations, expanded to emphasize that physiology and behavior are also interlinked with thoughts, emotions, and life circumstances, are the foundation upon which CBT is built. An example of how these intertwined experiences can interact to produce progressively worsening symptoms is illustrated by the cross-sectional CBT formulation in Figure 10.1. An important implication is that (though inadvertent), patients' solutions to their difficulties are actually the problem, maintaining symptoms, distress, and handicap.

CBT is a structured, problem-focused intervention. The therapist uses Socratic questioning to support patients to develop their own hypotheses regarding problems, explore assumptions and contradictions, and try to generate potential solutions. Most of the actual process of treatment takes place without therapy sessions, this being facilitated by planning and reviewing homework. In contrast to psychodynamic therapy, the therapist is open and explicit about the approaches being used.

Reflecting its intermingling of cognitive and behavioral theories, a CBT model of functional neurologic symptoms posits that the processes of classic and operant conditioning and emotional arousal interact with an individual's pre-existing conceptualization of illness to give rise to symptoms. In some individuals vulnerabilities such as early maladaptive experiences influencing unconscious processing of health-related information may be relevant, but this is not universal. Dissociation (discussed further in Chapter 8) is thought to be an important process in how symptom representations in memory can be expressed as physical symptoms (Brown, 2013). Once manifest, symptoms are perpetuated by unhelpful illness beliefs and counterproductive coping behaviors (safety behaviors, avoidance, symptom vigilance, and monitoring), which interact with the participant's emotional and physiologic state and interpersonal situation to form self-perpetuating vicious cycles of symptoms and disability. A proposed model is outlined in Figure 10.2.

Therapy aims to bring about improvement by addressing maintaining factors. This generally includes

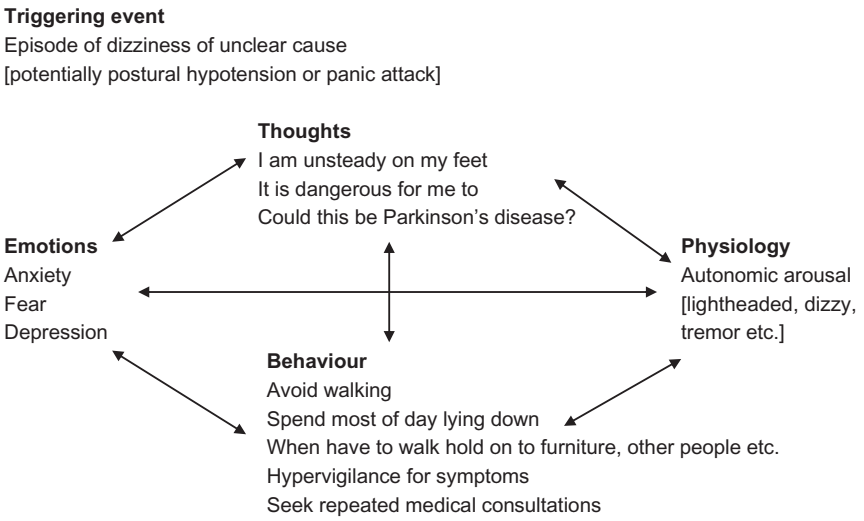

Fig. 10.1. Model formulation for maintaining processes in a patient with functional balance problems.

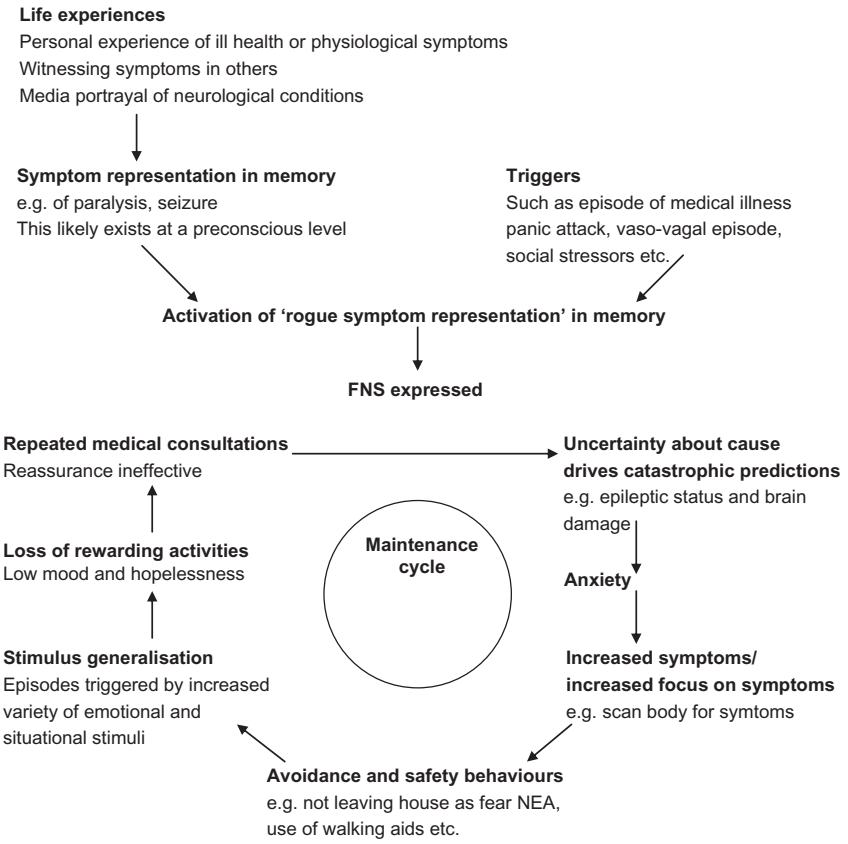

Fig. 10.2. Potential CBT formulation for how FNS come about and are maintained. (Influenced by Brown, 2013.)

changing unhelpful beliefs, teaching the patient relaxation techniques to manage anxiety, and replacing behaviors maintaining symptoms with ones fostering recovery.

Treatment begins with eliciting patients' own model of illness to establish what erroneous or otherwise unhelpful health beliefs they hold, and how they appraise and cope with their situation. Ideally, a neurologist has already provided an alternative, plausible, and hopefully acceptable explanation for symptoms. Research is limited here, but an explanation based on mechanism rather

than cause, emphasizing "functional" disruption, for example, using the analogy of a computer in which the hardware is fine but the software crashes, is often adequate initially (Stone et al., 2005). An emphasis on the positive findings supportive of a diagnosis of functional symptoms makes such an explanation credible, and these can be referred to (and even re-elicited) in subsequent discussions. If done effectively, this explanation undermines the common and frightening conviction that symptoms reflect unidentified underlying pathology. These beliefs both directly cause distress (with its associated emotional arousal and physiologic symptoms) and promote the process of aberrant attentional focus on the body believed so important in producing and maintaining functional neurologic symptoms. The explanation also provides a rationale for CBT as an appropriate treatment and logically leads to identifying and attempting to address maintaining factors. On this basis, a shared multifactorial understanding of their illness, focusing on the "here and now," but exploring if previous life events can explain the origins of beliefs and behaviors can be formulated. Of course, despite these efforts, patients often remain convinced they have a pathophysiologically based rather than functional condition. This should not preclude treatment, and these patients may still benefit from CBT.

It is important that the initial assessment details current level of functioning. As well as providing a baseline from which to build activity levels, a focus on what the patient is doing to cope with symptoms and what changes in activities have occurred since symptom onset can reveal the extent of avoidance and associated maintaining factors. These often include well-meaning but damaging facilitation of avoidance by family members or even formal carers, and unhelpful use of the healthcare system and medications. Following their identification, treatment aims to collaboratively address maintaining factors. Given they have prevented feared exposures (to situations, thoughts, or emotions), avoidance and safety behaviors have been intensely reinforced and are daunting for the patient to address. This is openly acknowledged, and patients are provided with attentional refocusing and/or relaxation techniques to support them in taking this step. The patient is warned that, as exposure begins, symptoms may transiently worsen, but this is a crucial step to improving function. A program to address avoided exposures is then agreed, the nature of this program varying depending on the specific symptoms being addressed. In patients with functional balance problems the target may be addressing the safety behavior of touching walls or holding on to furniture as they walk; in the patient with nonepileptic attacks it may be not leaving the house alone for fear of having a seizure; in the patient with functional tremor it may be actively using the affected hand in day-to-day activities.

Often a graded exposure program must be devised, specific behaviors being rated by how challenging/anxiety provoking they seem and the program beginning with activities which, though daunting, are not completely overwhelming. Each exposure must be repeated regularly until the anxiety/symptom experience associated with it has diminished by at least 50%; the patient can then progress to the next step in the hierarchy. Fundamental to the success of this treatment is that the activity is engaged in long enough for anxiety to diminish. If the duration of exposure is insufficient for this to occur, it will simply further sensitize the patient and potentially worsen symptoms.

While some patients will respond to an explanation of the model and a simple program of activity scheduling, many require unhelpful health beliefs to be explicitly addressed before improvement is seen. Various approaches such as behavioral experiments and symptom-monitoring charts (thought records) can facilitate this process (Table 10.2). The latter technique is useful for eliciting negative automatic thoughts; these are automatic appraisals of events which influence moment-to-moment symptom experience and reflect pervasive health (or more general) beliefs. In some patients addressing avoidance will itself result in reappraisal of negative automatic thoughts. For example, the fact they were not robbed despite having a nonepileptic attack in the supermarket undermines the conviction they can't leave the house in case this occurs. In other patients, however, the thoughts maintaining avoidance will need direct work before progress can be made. This will necessitate eliciting the automatic thoughts as accurately as possible, examining the evidence for and against them, and constructing more balanced thoughts that incorporate all the evidence available. The original thoughts have generally been greatly influenced by thinking errors (such as catastrophizing, generalizations, or perfectionism) whereas the balanced thoughts are not; consequently they are not associated with the same negative affect, and are less of a barrier to the proposed exposure.

As avoidance reduces and engagement in activities increases, a virtuous self-reinforcing cycle can quickly lead to considerable improvement in function. A major strength of CBT, deriving from the open and explicit manner in which techniques are introduced, is that treatment will ideally result in participants becoming expert in managing their problems. Consequently, by the end of treatment they are able to maintain and build on their progress.

It may that during the course of treatment other psychologic symptoms such as panic, depression, posttraumatic stress disorder, or personality disorder become evident. Alternatively the patient may have specific skills deficits, such as in assertiveness or sleep hygiene. CBT can help with these difficulties, and, if present, treatment of

Table 10.2

Commonly encountered CBT techniques

Guided discovery (or Socratic questioning)	Constructing questions in a manner which helps patients clarify their thoughts and beliefs. The aim is to help clients to work out alternative ways of looking at things and to test out the usefulness of new perspectives for themselves.
Behavioural assessment	Collation of information about activities engaged in currently and in the past. Want to establish both activities patient is currently engaging in and what they are avoiding.
Activity record	Prospective record compiled by the patient of activities. The patient is often asked to record intensity of symptom experience during each activity. This can help to identify activities associated with improvement or worsening of symptom experience.
Activity scheduling	A basic technique often used early in CBT to programme pleasant or satisfying activities and improve mood. It is however a fundamental part of the treatment of FNS, in which avoided activities must be identified and specifically programmed. The consequent increase in positive interactions with the world will itself improve feelings of wellbeing and sense of productivity. In essence pathogenic contingencies of reinforcement are replaced with salutary ones. If fatigue is prominent activities should be planned to gradually increase as stamina improves to prevent precipitating aversive post-exertional fatigue.
Exposure plus response prevention	Exposure to feared/triggering stimuli without escape or avoidance. Through habituation and extinction the exposure loses ability to trigger symptoms.
Graded exposure	Increasing exposure to avoided, anxiety-inducing stimulus in a planned, gradually increasing way. For therapeutic benefit the discomfort associated with a planned level of exposure must be tolerable, or it will simply result in escape/avoidance. Increases in intensity of exposure only occur when the patient has sufficiently de-sensitised to the current level of exposure such that it leads only to modest levels of anxiety.
Behavioural experiment	Planned intervention to gather information about consequences of changing a particular behaviour. They are used to test and modify dysfunctional beliefs. An example of how a behavioural experiment may be used could be to test the consequences of not sitting down as soon as they feel dizzy, but instead keep walking for five minutes to see what happens. They note what happens and then reflect on the implications of this for thinking and behaviour.
Problem solving	Structured process to identify the problems to be solved and the steps a person might take to try to solve them. It includes outlining the pros and cons of each potential option to help decide on and plan a specific course of action. Most people do not lack problem-solving skills, but they may be avoiding their problems.
Functional analysis	A process for clarifying what is maintaining behaviours which involves looking at their triggers and consequences.
Relaxation training	Approaches which aim to lower physiological arousal. Diaphragmatic breathing and progressive muscle relaxation (sequentially tensing and then relaxing all the muscle groups of the body) are most commonly used.
Symptom monitoring form (or thought record)	Form on which symptoms are monitored together with the situation the patient is in and associated emotions and thoughts. They gather information on potential triggers for symptoms as well as gathering information about (often catastrophic) thoughts and provide the patient with practice in recognising the emotions they experience.

conditions such as panic attacks or low mood will likely be important for improvement in functional neurologic symptoms to occur. More enduring problems (such as severe posttraumatic stress disorder or the sequelae of childhood sexual abuse) may require referral to practitioners with particular expertise in treating these conditions.

MINDFULNESS

In the late 1980s a new group of therapies based on acceptance rose to prominence. Mindfulness, derived from traditional Buddhist practice and based around the regular practice of meditation, was prominent amongst these. A core goal of mindfulness is to develop metacognitive awareness, which is the ability to experience cognitions and emotions as mental events that pass through the mind and may or may not be related to external reality. The focus is not to change "dysfunctional" thoughts, but to learn to experience them as internal events separated from the self (Segal et al., 2012). As a key aim of treatment of functional neurologic symptoms is for patients to develop the ability to tolerate symptoms

whilst not letting them dictate behavior, it has been suggested that these approaches may have particular utility for this patient group (Baslet et al., 2015; Detert, 2015). Whilst currently very popular, the efficacy of mindfulness remains to be properly tested. A note of caution should be sounded, as in other fields of anxiety and depression, randomized trials, as opposed to case series, of mindfulness-based CBT are not showing improved outcomes compared to traditional CBT practice, although the quality of studies is in general low, preventing a definitive statement of mindfulness's utility being made (Hofmann et al., 2010; Hunot et al., 2013).

CONCLUSIONS

A range of psychologic theories have been proffered over the years to attempt to explain functional symptoms. No comprehensive explanatory framework exists and most have significant limitations. One can see helpful elements within the majority of theories, but one is equally reminded that anyone who thinks s/he holds all the answers psychologically or that a single theory is explanatory is probably woefully naive.

References

American Psychiatric Association (1980). Diagnostic and statistical manual of mental disorders (3rd ed., text rev.), American Psychiatric Association, Washington, DC.

American Psychiatric Association (2000). Diagnostic and statistical manual of mental disorders (4th ed., text rev.), American Psychiatric Association, Washington, DC.

Armstrong D (1986). Illness behaviour revisited. In: Proceedings of the 15th European Conference on Psychosomatic Research, Libbey, London.

Bandura A (1971). Social learning theory, General Learning Press, New York.

Baslet G, Dworetzky B, Perez DL et al. (2015). Treatment of psychogenic nonepileptic seizures: updated review and findings from a mindfulness-based intervention case series. Clin EEG Neurosci 46: 54–64.

Bowlby J (1951). Maternal care and mental health. Bull WHO 3: 355–534.

Breuer J, Freud S (1955). Studies on Hysteria. Translated from the German, In: J Strachey (Ed.), The Standard Edition of the Complete Psychological Works of Sigmund Freud, Vol. II. Hogarth Press, London.

Brown RJ (2013). Dissociation and somatoform disorders. In: F Kennedy, H Kennerley, D Pearson (Eds.), Cognitive Behavioural Approaches to the Understanding and Treatment of Dissociation, Routledge, Abingdon, UK, pp. 133–138.

Cameron LD, Leventhal H (2003). The Self-regulation of Health and Illness Behaviour, Routledge, London.

Carson A, Stone J (2015). Functional symptoms. In: M Turner, M Kiernan (Eds.), Landmark papers in Neurology, Oxford University Press, Oxford.

Cohen ML, Testa SM, Pritchard JM et al. (2014). Overlap between dissociation and other psychological characteristics in patients with psychogenic nonepileptic seizures. Epilepsy Behav 34: 47–49.

Detert NB (2015). Mindfulness for neurologists. Pract Neurol 15 (5): 369–374.

Edwards MJ, Adams RA, Brown H et al. (2012). A Bayesian account of 'hysteria'. Brain 135: 3495–3512.

Fairbairn WRD (1944). Endopsychic structure considered in terms of object-relationships. Int J Psychoanal 25: 70–92.

Fairbairn WRD (1954). Observations on the nature of hysterical states. Br J Med Psychol 27: 105–125.

Freud S (1953–1957) (edited and transl. Strachey J), The Standard Edition of the Complete Psychological Works of Sigmund Freud. London: Hogarth Press and the Institute of Psycho-Analysis.

Gay P (2006). Freud: A Life for Our Time, W. W. Norton, London.

Goldstein LH, Mellers JDC (2006). Ictal symptoms of anxiety, avoidance behaviour, and dissociation in patients with dissociative seizures. J Neurol Neurosurg Psychiatry 77: 616–621.

Goldstein LH, Mellers JDC, Landau S et al. (2015). Cognitive behavioural therapy vs standardised medical care for adults with dissociative non-epileptic seizures (CODES): a multicentre randomised controlled trial protocol. BMC Neurol 15: 98.

Guze SB (1967). The diagnosis of hysteria: what are we trying to do? Am J Psychiatry 124: 491–498.

Hitchcock J, Davis M (1986). Lesions of the amygdala, but not of the cerebellum or red nucleus, block conditioned fear as measured with the potentiated startle paradigm. Behav Neurosci 100 (1): 11.

Hofmann SG, Sawyer AT, Witt AA et al. (2010). The effect of mindfulness-based therapy on anxiety and depression: a meta-analytic review. J Consult Clin Psychol 78 (2): 169–183.

Hunot V, Moore THM, Caldwell DM et al. (2013). 'Third wave' cognitive and behavioural therapies versus other psychological therapies for depression. Cochrane Database Syst Rev (10): Art. No.: CD008704.

Kant I (1800). Lectures on Logic (The Cambridge Edition of the Works of Immanuel Kant). Cambridge University Press, Cambridge, 2000. 2nd Print edition (17 April 2009).

Klonoff EA, Moore DJ (1986). 'Conversion reactions' in adolescents: a biofeedback-based operant approach. J Behav Ther Exp Psychiatry 17: 179–184.

Koos EL (1954). The health of Regionville: what people thought and did about it. Columbia University Press, New York.

Lieberman DA (2012). Human learning and memory, Cambridge University Press, Cambridge.

Ludwig L, Whitehead K, Sharpe M et al. (2015). Differences in illness perceptions between patients with non-epileptic seizures and functional limb weakness. J Psychosom Res 79: 246–249.

Masson JM (1984). The assault on truth, Freud's suppression of the seduction theory. Farrar, Straus and Giroux, New York.

McCullough ML (2001). Freud's seduction theory and its rehabilitation: a saga of one mistake after another. Rev Gen Psychol 5: 3–22.

Mechanic D (1962). The concept of illness behaviour. J Chron Dis 15: 189–194.

Mechanic D (1977). Illness behaviour, social adaptation, and the management of illness. J Nerv Ment Dis 165: 79–87.

Mind Report (2013). We still need to talk: a report on access to talking therapies. Mind, London.

Mizes JS (1985). The use of contingent reinforcement in the treatment of a conversion disorder: a multiple baseline study. J Behav Ther Exp Psychiatry 16: 341–345.

Nielsen G, Stone J, Edwards MJ (2013). Physiotherapy for functional (psychogenic) motor symptoms: a systematic review. J Psychosom Res 75: 93–102.

Nielsen G, Stone J, Matthews A et al. (2015). Physiotherapy for functional motor disorders: a consensus recommendation. J Neurol Neurosurg Psychiatry 86: 1113–1119.

Pareés I, Kojovic M, Pires C et al. (2014). Physical precipitating factors in functional movement disorders. J Neurol Sci 338: 174–177.

Parsons T (1951). The Social System, The Free Press of Glencoe, New York.

Pilowsky I (1969). Abnormal illness behaviour. Br J Med Psychol 42: 347–351.

Reuber M, Jamnadas-Khoda J, Broadhurst M et al. (2011). Psychogenic nonepileptic seizure manifestations reported by patients and witnesses. Epilepsia 52: 2028–2035.

Roberts NA, Reuber M (2014). Alterations of consciousness in psychogenic nonepileptic seizures: emotion, emotion regulation and dissociation. Epilepsy Behav 30: 43–49.

Rodman FR (2003). Winnicott: Life and work, Perseus, Cambridge, MA.

Rush AJ, Beck AT, Kovacs M et al. (1977). Comparative efficacy of cognitive therapy and pharmacotherapy in the treatment of depressed outpatients. Cognit Ther Res 1: 17–37.

Rycroft C (1995). A Critical Dictionary of Psychoanalysis. Penguin Books, London. p. 59.

Schacter DL, Gilbert DT, Wegner DM (2011). B. F. Skinner: The Role of Reinforcement and Punishment Psychology. 2nd Edition, Worth, New York.

Segal ZV, Williams JMG, Teasdale JD (2012). Mindfulness-based cognitive therapy for depression. Guilford Press, New York.

Sharpe M, Stone J, Hibberd C et al. (2010). Neurology outpatients with symptoms unexplained by disease: illness beliefs and financial benefits predict 1-year outcome. Psychol Med 40: 689–698.

Stafford-Clark D (1967). What Freud really said. MacDonald, London.

Stone J, Binzer M, Sharpe M (2004). Illness beliefs and locus of control: a comparison of patients with pseudoseizures and epilepsy. J Psychosom Res 57: 541–547.

Stone J, Carson A, Sharpe M (2005). Functional symptoms and signs in neurology: assessment and diagnosis. J Neurol Neurosurg Psychiatry 76 (Suppl 1): i2–i12.

Stone J, Warlow C, Sharpe M (2010). The symptom of functional weakness: a controlled study of 107 patients. Brain 133: 1537–1551.

Thorndike, E. L. (1898, 1911) Animal intelligence: an experimental study of the associative processes in animals. Psychological Monographs #8.

Weinman J, Petrie KJ, Moss-Morris R et al. (1996). The illness perception questionnaire: a new method for assessing the cognitive representations of illness. Psychol Health 11: 431–445.

Whitehead K, Kandler R, Reuber M (2013). Patients' and neurologists' perception of epilepsy and psychogenic nonepileptic seizures. Epilepsia 54: 708–717.