COGNITIVE-BEHAVIORAL MANAGEMENT OF TIC DISORDERS

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CONTENTS

ABOUT THE AUTHOR

Kieron O'Connor began his research career working as a research officer at the Medical Research Council (UK) Clinical Psychiatry Unit at Graylingwell Hospital, Chichester, Sussex. In 1979, he was awarded a Master of Philosophy (MPhil) by thesis in experimental psychology from the University of Sussex, and in 1984 a doctorate degree (PhD) in research psychology at the Institute of Psychiatry, University of London. He completed the British Psychology Society clinical diploma training course in 1986, and transferred to the University College, Institute of Laryngology and Otology, working partly as a research lecturer, investigating psychological aspects of vertigo and dizziness, and also as a clinical psychologist at Bloomsbury Health Authority.

In 1988, he was awarded the first of a series of fellowships by the Fonds de la Recherche en Santé du Québec, and established a clinical research program at the Fernand-Seguin Research Center, Louis-H. Lafontaine Hospital, University of Montreal, Canada. The multidisciplinary research program, which focuses on obsessive-compulsive disorder (OCD), Tourette and tic disorder and delusional disorder, is currently funded by the Canadian Institutes of Health Research. He is actively involved in several community-based initiatives to provide support and information to people with OCD and Tourette's syndrome and their families, and is scientific advisor to the Quebec OCD Foundation.

He is currently associate research professor at the Psychiatry Department of University of Montreal, and also holds an honorary cross appointment as associate professor in the Department of Psychology, University of Quebec at Montreal. He is author or co-author on over 100 scientific publications. He is also co-author with Frederick Aardema and Marie-Claude Pélissier of *Beyond Reasonable Doubt: Reasoning Processes in OCD Disorder and Related Disorders*, published in 2005 by Wiley.

PREFACE

The focus in this text is on cognitive-behavioral approaches and related psychoeducational and psychophysiological methods, to aid the management of tics in people with Gilles de la Tourette's syndrome and chronic tic disorder. The initial section of the book reviews the relevant literature and research work in this area. The middle section presents a cognitive–psychophysiological model of tics, together with an outline of empirical studies testing the model. The final section and appendices provide a therapist and client manual for use in tic management, with four case illustrations.

Cognitive-behavior therapy (CBT) will probably be familiar to professional and non-professional readers alike as a recently developed evidence-based psychological intervention that has been successfully applied to anxiety, affective and, lately, psychotic disorders. In practice, the CBT approach often complements other more medical approaches, but it nonetheless follows a distinct case conceptualization of psychiatric disorder based on CBT principles. It views symptoms as behavior, actively maintained by thought and behavior patterns in the here and now, rather than as the result of more remote hypothetical intrapsychic processes. Consequently, treatment follows a learning model, where control over symptoms depends on the active collaboration of the client in successful acquisition and application of new ways of thinking and behaving. In this tradition, behavioral and learning principles have been applied in several recent attempts to understand and treat tic and habit disorders. The term "habit disorder" has an uncertain diagnostic status in psychiatric nosology, but covers a range of usually manual habits such as nail biting, skin picking, scratching, rubbing, hair pulling, teeth grinding, neck and knuckle cracking.

A habit disorder generally seems to be under some degree of voluntary control but which the person, nonetheless, is unable to stop, unlike tics which appear more like neurological reflexes. There is debate as to whether tics and habits form a continuum. However, habit disorders, in particular trichotillomania, have already formed the subject of a number of comprehensive manualized CBT treatments emphasizing, in addition to behavioral control, the emotional, interpersonal and cognitive dimensions of the habitual behavior (e.g., Mansuetto et al., 1999). There is a less extensive CBT literature on treating tics, but tics as found in Tourette's syndrome and other tic disorders have, however, formed the target for a behavioral approach termed "habit reversal" (Azrin & Nunn, 1973; Woods & Miltenberger, 2001). There is a growing body of clinical evidence supporting the effectiveness of habit reversal in reducing tics, but there have been few large-scale studies of its efficacy, and since habit reversal is a multicomponent program, it is unclear which are its crucial

elements. Also, habit reversal procedures are inspired by behavioral principles rather than a specific model of tic phenomenology. But tics are not just conditioned responses. Consequently, the clinical success of behavior therapy has not been accompanied by an improved and more comprehensive cognitive-behavioral conceptualization of tic maintenance or genesis. Also, the habit reversal view of tics as isolated behavioral events, and the failure to explicitly address cognitive variables, can limit its consideration of the wider everyday cognitive-behavioral context relevant to tic management.

The gap between behavior and cognition is, to some extent, an artificial one, and even in a strictly behavioral approach, the clients must understand the model, and articulate their motivation and reasons for changing the habit and be able mentally to link cause and effect in their application of techniques. Although seldom explicitly measured, it is clear from case studies reporting behavior therapy for tics that, as in other psychiatric disorders, behavioral change can be accompanied by a change in thinking about the disorder. However, in our own work, we realized that cognitive factors were not only a useful adjunct to behavior therapy but were often central to the occurrence of the tic. For example, anticipation can provoke tics or even just thinking about ticcing can provoke tics, and negative evaluation of high-risk situations can lead to increased levels of tension and ticcing.

Previous models of tics have focused either on the role of central brain structures or on localized social or behavioral operants reinforcing the tic, but there is also a vast and largely untapped literature on the intermediate processes between brain and behavior relating to the psychology and psychophysiology of motor behavior. Motor psychophysiology can shed light on how central commands control the intricacies of preparation and muscle tension, and how such preparation and tension can produce unwanted voluntary and involuntary movements. This approach views cognition and behavior, voluntary and non-voluntary action as different stages in the same motor action sequence. Thought-action, cognitive-motor coupling can be accommodated by a cognitive–psychophysiological model which takes account of forward planning and feedback correction as a part of motor control, and views even non-voluntary actions as occurring against a background behavioral action plan.

As the motor theorist Bernstein (1967) pointed out, no individual contraction can be considered independent of the wider intentional actions of the motor program, and this motor program, in turn, has to be understood in terms of an ecological adaptation to the environment. Hence, it may be towards the overall telic activity of the person that we need to look for clues about tic onset rather than to just neurobiological structures or situational operants. The cognitive–psychophysiological model led to the development of a CBT approach that, although complementing and building on previous behavioral interventions, placed cognitive factors center stage. In effect, isolated habit reversal strategies are integrated into a wider cognitive-motor restructuring of behavior preceding tic onset in order to prevent the tic occurrence rather than resist it once it has appeared. Inevitably, such cognitive and motor restructuring addresses the wider behavioral context surrounding the person's style of action.

The major claims of the model have been empirically tested through psychometric, experimental and clinical studies discussed in Chapters 3 and 4. The program itself has been validated as an effective treatment for adults and adolescents with Tourette's, chronic tic and habit disorder. It is designed to be implemented in conjunction with a professionaly trained therapist, and both client and therapist manuals are provided. Issues about its future application to other client groups and disorders are discussed in Chapter 5.

Kieron O'Connor
Montreal, September 2004

There is a dedicated website for this book at www.wiley.com/go/tic containing the forms from Appendices 1, 2, 6, 7 and 8 and the client manual. These are available to readers to view and download.

ACKNOWLEDGMENTS

Chapter 1

THE NATURE OF TIC DISORDERS

► DEFINITION

Tics are defined, rather vaguely, in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV; American Psychiatric Association, 1994) nosology as a recurrent, non-rhythmic series of movements (of a non-voluntary nature) in one or several muscle groups. Tics are usually divided into simple and complex tics of a motor, sensory, phonic or cognitive nature. In practice, simple tics have to be differentiated from behaviors such as routines, automatisms and stereotypes; from spasms of neurological or neurochemical origin, and from dystonias and torticollis of a possibly psychoneurological origin. Also, complex tics, which are complex if they involve sequences of several distinct muscle movements, can visibly resemble the ritualized compulsions of obsessive-compulsive disorder (OCD).

► DIAGNOSIS

Tics occur over all cultures, and have been reported anecdotally since classical times. The first clinical descriptions, however, were provided in the nineteenth century by Itard (1825), who reported a case of an aristocrat exhibiting tics, barking and obscenities, and later Gilles de la Tourette (1885), who gave a detailed description of eight additional cases. Currently, the DSM-IV distinguishes transitory tics from chronic tic disorders (TD) and Gilles de la Tourette's syndrome (TS). Transitory tics are those occurring for a short period, usually in early childhood, which slowly disappear or show spontaneous remission later in adolescence. In TD, typically, one or several simple or complex tics are present. Often the tics are stable over a period of years since childhood. The tics occur daily and cause distress. Although the diagnostic criterion specifies onset prior to age 18, tics may develop in adulthood. TS is recognized in the DSM-III and DSM-IV as a distinct diagnostic category with multiple tics including at least one phonic tic occurring several times a day, every day, throughout a period of more than one year and whose location, number, frequency and severity can change over time with onset before the age of 18 years. Although clinician consensus tends to view TD as a milder form of TS, diagnosis of TS is categorical not dimensional. Kraemer et al. (2004) point well to the pitfalls of using categorical instead of dimensional approaches to classification, and although both have uses in different settings, the reliance entirely on

categorization of TS and TD in the complete absence of a dimensional model could be problematic. There seems to be a consensus among researchers that TD and TS share enough common aspects to be considered on a continuum of severity (e.g., Spencer et al., 1995). But the diagnosis of TS is currently dichotomous, not dimensional, and depends crucially on the existence of a vocal tic, although there has been controversy about current criteria for TS (e.g., First et al., 1995; Tourette Syndrome Classification Study Group, 1993). Some current assessment instruments do adopt a dimensional approach (see Table 6.1).

Tics may be simple or complex. A *simple* tic involves one principal muscle group. Simple tics include blinking, cheek twitches, head or knee jerks and shoulder shrugs. Tics are mainly confined to the upper body and the most common occur in the eye, head, shoulders and face, and follow a rostral–caudal development. Tics can also be vocal and include coughs, tongue clacking, sniffing, whistling, throat clearing, hiccing, barking and growling. Some recurrent involuntary somatic sensations are classified as sensory tics. These are identified as heavy, warm or tingling premonitory sensations, often muscle focused and leading to muscle tension (Lohr & Wisniewski, 1987; Shapiro & Shapiro, 1986; Shapiro et al., 1988) but the term "premonitory sensation" is now preferred over sensory tic (Cath et al., 2001a). Table 1.1 gives examples of common tics.

Tics are classified as *complex* if there is a contraction in more than one group of muscles (Comings & Comings, 1984). Complex tics may involve sequences of movements, and may take the form of bizarre mannerisms involving several limbs or extremities. J's complex tic begins with a turn of the head towards the right, his hand comes up across his forehead and descends over his head, while his head makes a full semi-circle rotation, and he exhales at the same time. M's complex tic begins with an extension of the shoulder and then a contraction back to the center while his left shoulder repeats the same action. He repeats this back and forth until he "feels right". Complex tics may also take the form of self-inflicted repetitive injurious actions such as head or face slapping, face scratching, teeth grinding, neck cracking, tense–release hand-gripping cycles, or finger twiddling. In neck cracking, the person may manually lift, turn and replace the head on the cervical vertebrae, producing a clicking or grinding sound. Similarly, in knuckle cracking, the person will force the fingers down onto the knuckle joints.

Complex vocal or, more precisely, phonic tics (Jankovic, 1997) take the form of repeated sounds, words or phrases or swear words, and, in rare cases, coprolalia (swearing). Normal actions and words of the person may also be repeated or exaggerated, and copying others can itself evolve into a complex repetitive movement either by echopraxia (motor mimicry) or by echolalia (repeating others' words, phrases or sounds). Complex tics can resemble habit disorders (HD) such as trichotillomania (hair pulling), bruxism (teeth grinding), scabiomania (skin scratching or picking), onychophagia (nail biting), which are, however, classified among the impulse control disorders. There is a covariation between tics and HD and among different types of HD (Woods et al., 1996a). So a person with tics is more likely, than normal, to suffer also from HD. Although complex tics by their semi-voluntary nature may have some intentional aim even if the intention is

Table 1.1   Examples of simple/complex tics

Parts of body	Involuntary repetitive movement habits
Vocal	Coughing, burping, throat clearing, humming, making noises, swallowing, repeating phrases or tunes
Hands	Rubbing fingers together, waggling or clinching fingers or cracking fingers or knuckles, scratching, twiddling, doodling, tapping, fidgeting, stroking (earlobes, chin, etc.), playing with objects, clenching/unclenching the fist
Eyes	Winking, excessive blinking, eyelid tremor squinting, straining eye muscles
Face	Nose wrinkling, ear tics, cheek tics, forehead and temple tension
Mouth	Lip movements, chewing, teeth grinding, tongue ducking, parsing, pouting, forcing tongue against palate, biting tongue, biting fingernails
Head	Head tic to the side, front or back
Shoulders	Movement shrug up and down or forwards or backwards or on one side
Abdomen	Tensing stomach or abdomen into a knot
Legs	Moving legs repetitively up and down or towards and away from each other
Torso	Tensing, twisting or gyrating movements involving legs, arms or trunk
Mental	Playing a tune or phrase over and over in the head, mentally counting for no reason

sensory adjustment (making symmetrical movements to feel "just right"), simple tics seem to serve no purpose.

Tics generally appear in the superior part of the body, including eyes, forehead, mouth, face, neck, shoulders, and can occur anywhere between one and 200 times per minute. Simple facial tics generally have a higher frequency. The onset of simple tics generally precedes complex tics, and simple tics can develop at any time in childhood from 0 to 5 years. Vocal tics develop after motor tics and it is rare for tics to develop post-adolescence, although they can develop in adults (Cohen et al., 1992), often following trauma or surgery. For example, eye blinks may develop as a defensive reaction to light following eye surgery. However, tics seem to wax and wane in severity throughout life and may in the case of TS be substituted by completely different tics or may even spontaneously remit (Nomoto, 1989).

Technically speaking, complex tics are distinguishable from stereotypies and compulsive rituals, routines and habits, since tics are neither completely conscious purposeful rituals, nor totally non-sensical repetitions. In fact, the term "behavioral stereotypy" is usually applied to abnormal repetitive actions associated with organic loss and mental deficiency. In practice, however, it is sometimes

difficult to distinguish tics, routines, habits and repetitive movements. The relationship between these three is puzzling since some movements have impulsive as well as compulsive elements. Shapiro and Shapiro (1986) referred to "impulsive compulsions" to highlight the confusion, and Rasmussen and Eisen (1992) and other authors have equally underlined the importance of understanding the relationship between impulsion and compulsion for clarifying diagnosis. In normal automated routines, there may be little awareness but there is overall volitional control. In rituals, there may be awareness but no control. In reflexes and tics, there may be neither awareness nor control.

► WHAT COUNTS AS A TIC?

People themselves often refer to a number of movements and habits as tics. They may consider playing with a paper clip or toying with an object as a tic, but obviously to qualify as a clinical problem, a tic must produce distress and be sufficiently uncontrollable. Playing with a paper clip can be stopped by focusing attention on it. Similarly, routines of the day such as tying shoe laces, driving to work, the way we walk or eat a sandwich are automated habits and may even become endearing or irritating personal characteristics, but they are essentially under voluntary control and we can change them with practice in the same way that we can learn other motor skills (eg., sport activities) through practice. Of course, where habits are motivated by fear or strongly held self-interest or are tied to pleasurable sensory states, they may be more difficult to change.

The paradox of tics is that they take place in voluntary muscles. The muscles concerned with regulating heart rate, breathing or other autonomic functions are not considered to produce tics. So tics occur in muscles used usually for voluntary control, and yet they appear non-voluntary; not only non-voluntary but often undetected by the person. Here again we have another paradox since although at the time they occur, tics are non-voluntary and often non-conscious, the urge to tic can be wilfully mentally suppressed or physically held in for often considerable periods of time. Although some simple tics resemble neurological spasms, more complex tics can resemble complex, willful actions. A man feels compelled to stand up and adjust his shoulders back and forth for five minutes to an exact frequency and symmetry in order to feel just right. Is this a tic, a habit or a compulsion? It is not surprising that tics have caused diagnostic problems.

De Groot, Janus and Bornstein (1995), in a study of 20 symptoms in 92 children and adolescents, extracted five factors accounting for 63% of the variance and which were labeled in order of importance "aggressive movements", "oro-facial contractions", "body movements", "peripheral movements and simple phonic tics", and finally "complex motor and phonic tics". Alsobrook and Pauls (2002) conducted a factor analysis of 29 symptoms in 85 cases of TS and found a four-factor solution adequate to account for 61% of the variance. The factors grouped symptoms respectively into "temper fits and aggression", "motor and phonic tics", "compulsive behaviors" and "absence of grunting and the presence of tapping". However, the clusters in both these studies may reflect the peculiar diversity of the sample and

not be stable clusters of symptoms for TS in general. In vocal tics, it is usually the content which determines complexity – a repeated sentence or phrase being considered complex, whereas a single sound or word, even if lasting a long time, would be simple. The status of sensory tics is more controversial, with some arguing that they are precursors to motor tics rather than a sensory phenomenon in themselves. One form of tic, mental or cognitive, is often underdiagnosed and poorly understood. These tics are frequently confused with obsessions or ruminations since the person repeats a song or a phrase or a scene over and over mentally. But in fact they have more in common with other tics than with obsessions.

► COMORBIDITY AND COVARIATION

One problem with subtyping by symptoms is that there is often a lot of covariation between simple and complex tics and also habit disorders. In TS, multiple tics are frequently found together with other behavioral and attentional problems, such as attention deficit and hyperactivity disorder (ADHD) (Knell & Comings, 1993).

The comorbidity of a tic disorder with OCD varies across studies between 25 and 63%. But where OCD occurs with either TS or TD, the tics and obsessions seem to develop independently (Swedo & Leonard, 1994). In the case of tic-related OCD, the compulsions seem to resemble more sensory-based rituals, and raises the question as to whether such rituals are better classified as impulsive than compulsive (see Table 1.2). George et al. (1990) have developed a clinical questionnaire with some clinical face validity to distinguish the sensory-based types from other compulsions. Although TDs do not seem to have any greater psychiatric comorbidity than normal, there is considerable concern over concurrent behavioral disorders. Indeed, for many patients and their families, it is the accompanying behavioral disorders such as ADHD that cause many of the apparent deficits in TS. In particular, severity of tic symptoms has been positively related to behavioral problems. There have also been tentative suggestions that TS may share comorbidity with

Table 1.2 Sensory compulsions

- Touching objects
- Touching self
- Stroking surfaces
- Repeated handling/fondling of objects or material
- Saying something to shock
- Imitating others' actions/words/sounds
- Self-stimulation/self-injury
- Impulsive sexual gestures
- Repeating an action just for the feel
- Running a violent scene or act repeatedly over in the head to be excited
- Crumpling up or destroying objects for the feel or sound
- Adjusting body parts to produce sensations/stimulation or to "feel" right

Source: Inspired by George et al. (1990). Obsessions in obsessive-compulsive disorder with and without Gilles de la Tourette's syndrome. *American Journal of Psychiatry*, **150** (1), 93–97.

bipolar disorder and schizophrenia. This comorbidity issue is particularly important in children where the presence of both TS and OCD may initiate behavioral disturbances such as rage syndrome. The relationship between childhood and adult comorbidities also remains uncertain. For example, the literature on adult manifestations of hyperactivity is sparse (Lamberg, 2003).

► SECONDARY DISTRESS

Tics are rarely life-threatening except in rare cases where they may provoke automutilation. Some complex tics can be quite severe and self-mutilating and involve head banging, eye gouging, neck dislocation. Even in the absence of mutilation, psychosocial distress in TD and TS can be considerable and can involve secondary phobias, depressions and social anxieties and worries over self-image, very low self-esteem and relationship problems. In our assessment of the interference of TD and HD in daily activities (see Appendix 1d), we found cases of unemployment, marital conflict, interpersonal difficulties, strained work relations, self-imposed travel restrictions, anxiety attending social or public functions, performance worries (e.g., about driving, speaking, teaching, dancing, sport), all of which were perceived (by the affected person) to be a result of the tic habit (O'Connor et al., 2001b). People with tics often experience low self-esteem and are (or become) hyperattentive to the judgment of others with consequent low self-satisfaction (Thibert et al., 1995). In TD, ironically, the very anticipation of experiencing a negative self-evaluation can provoke the tic (see later section).

► PREVALENCE

The incidence of TS in adults is about 0.1–1%. Estimates of TS in children have been as high as 3% with an increase to 28% in special needs group (see Robertson, 2000, for review). The lifetime prevalence of TD is not known but estimates vary between 5% and 10% of the population, with estimates of 18% in child populations (Mason et al., 1998). In an epidemiological study of the Quebec population, O'Connor et al. (1998) found a self-report rate of 8% lifetime prevalence. Other recent estimates have placed the prevalence of TS at 1% and TD at 10% of the population (Robertson, 2001; Robertson & Stern, 2000). There are, however, problems with clinical estimates of prevalence. Fallon and Schwab-Stone (1992) pinpointed several methodological shortcomings in evaluating comorbidity studies of TD, in particular sample selection bias (e.g., the clinician's illusion springing from the use of clinical, not community, samples). Identifying cases through self-report can also be problematic, especially if people are misinformed about tics, or employ a commonsense definition.

Tics develop in childhood and simple tics usually precede more complex tics, with phonic tics usually developing which will often begin as breathing or sniffing noises subsequent to motor and sensory tics. The most notorious TS vocal tic, coprolalia (swearing), is rare. In our adult TS samples, only 5.4% show any such verbalizations.

Goldenberg et al. (1994) reported a prevalence of 8%. Kurlan (1992) estimates that coprolalia or copropraxia (obscene gestures) are maximal during adolescence and decline with age. Interestingly, one of our TS clients in Quebec with coprolalia, who was perfectly bilingual (English, French), would swear in whatever language he was speaking at the time. Since the lexical content of swear words is very different in English (bodily parts or functions) and French (religious symbols), clearly it is the act of swearing, and not the words, that is important. There is some evidence that TS with coprolalia have easier or less inhibited access to scatological vocabulary (Stip et al., 1999).

Leckman et al. (1998) note a 10-fold higher prevalence of TS in children than in adults, with a peak of the worst period even at age 10 with mean onset at age 5.6 years. Of their sample of 42 TS patients, they note that, at age 18, over half were tic-free. They also suggest that the course of tics can be modeled to fit normal maturational processes. Approximately 15% of children develop transitory tics, of which 80% show spontaneous remission. Tics can develop as learned habits or by mimicry, and often in TS they will displace themselves around the body.

Although the type of tics may not differ between children and adults, associated problems differ. Learning difficulties in children and adolescents seem predictive of peripheral tics and phonic tics, and in children tics are frequently associated with rage and aggressive movements. Robertson et al. (1989) noted that 33% of TS patients showed automutilating behaviors such as head hitting, self-wounding and fist beating and this mostly in adolescents. Gilles de la Tourette (1885), in his original case series, reported a case of automutilation in a boy of 14 who chewed his lips.

► RELATIONSHIP OF TICS WITH OTHER DISRUPTIVE BEHAVIORS

Several clinical studies have reported an association of tic severity and behavioral disturbance but others fail to find a connection. The reason for the discrepancy may be that other conditions such as ADHD are not taken into account. Sukhodolosky et al. (2003), for example, reported that while TS did not differ from controls on gestures of aggression and disruption, those with TS + ADHD were significantly higher on measures of aggression and disruption. ADHD is a controversial diagnosis and needs to be distinguished from simple motor restlessness. Zapella (2002) reported a series of cases with early onset TS and reversible autistic behavior, where the initially autistic-type behavior reversed as a result of emotional and behavioral interaction and shared emotional experience with parents, while the tics developed into full-blown TS. The authors note that the children were over-sensitive and the parents also had tics. Kerbeshian and Burd (2003) reported that TS is a positive prognostic indicator in autism. Other have suggested evidence of comorbidity of TS with bipolar disorder (Kent & Craddock, 2003).

Coffey et al. (2000) tried to distinguish the impact of tic severity versus illness severity in children and adolescents with TS. Subjects were 156 consecutively re-ferred children. Twelve per cent were hospitalized and though tic severity was a

marginal predictor of hospitalization, major depression and bipolar disorder were more robust predictors even after adjustment for all other sociodemographic and clinical variables. Previous studies have shown that anxiety is strongly associated with tic severity. Depression is associated with greater dysfunction in TD. Although only a few reports have recognized the presence of bipolar disorder and TD, this comorbidity signals very poor prognosis.

Wilkinson et al. (2001) examined the impact of TS with and without comorbid disorder on family life, using the family impact scale (FIS). There was significant positive correlation between the number of comorbid behavior disorders and FIS. Other studies have examined comorbidity of TS and schizophrenia. Müller et al. (2002) point to an overlap of symptoms between schizophrenia and TS, including motor/vocal symptoms, echolalia, echopraxia and repetitive stereotypical movements or bizarre gestures and grimaces. They describe five cases, mainly delusional, where the initial presence of TD was associated in later life, mainly with psychotic anxiety. Of course tics can arise as a consequence of neuroleptic administration (Tardive Tourette Syndrome).

► DISTINGUISHING IMPULSIONS AND COMPULSIONS: SENSORY TICS, COGNITIVE TICS AND OBSESSIONS

Shapiro and Shapiro (1992) have argued that sensory preoccupations are not to be confused with obsessions since there seems to be no logic to the preoccupation. Cognitive content would appear to be a key distinguishing feature of tics and rituals. On the face of it, tics are involuntary impulsive purposeless movements whereas OCD is characterized by the presence of intrusive thoughts. Miguel et al. (1995), in a study of intentions preceding OCD and TD, reported that whereas all 15 adults with OCD reported thoughts preceding rituals, only two out of 12 with TS reported thoughts, the remainder of the sample reporting sensations. The assumption implicit in this voluntary/non-voluntary, cognitive/non-cognitive distinction between tics and rituals is that no cognitive activity precedes tic onset, but tics do not occur in a void and a sensory sensation or premonitory urge frequently precipitates the tic. This sensation is frequently associated with tension in the surrounding muscle area. Leckman et al. (1993) reported that 93% of a sample of 135 people with tics aged 8–71 reported premonitory urges prior to the tic and this, according to the authors, challenged the conventional wisdom that tics are involuntary. Chee and Sachdev (1997) studied 50 TS patients, 50 OCD patients and 50 healthy controls to determine the prevalence and phenomenology of sensory tics. The authors attempted to distinguish sensory tics (experienced as transient, recurrent, localizable and close to the skin) from urges (experiences as a drive preceding a behavioral response, conscious, not localizable and suppressible). The sensory tics in both the TS and OCD groups were predominantly located in rostral anatomical sites. The lifetime prevalence of sensory tics in the TS group was 28%, compared to 10% in the OCD group and 8% in the controls. The authors conclude that sensory tics are a separate tic phenomena independent of motor tics and seem to be a common feature of TS and a subgroup of OCD predisposed to tics. It is not clear if this sensation

serves as a warning, a precipitator or is, in fact, part of the tic, since the sensation can persist even when treatment alleviates the actual tic movement. One possible interpretation of sensory tics is that they represent the subjectively experienced component of neural dysfunction below the threshold for motor or vocal tic production (Chee & Sachdev, 1997). Kane (1994) has suggested that the urges represent a heightened attention to physical sensations, and that a particularly heightened sensitivity of the person with tics to somatic sensation produces an attentional focus which provokes the tic. O'Connor (2002) has suggested that the premonitory sensation may be a product of both cognitive and sensory factors (see Figure 2.2).

Cath et al. (1992a) have introduced the notion of a "cognitive tic" as a means of clarifying some of the confusion between intrusive mental impulses and obsessional ruminations. The distinguishing factor between "cognitive tics" and "ruminations", according to Cath et al. (1992a), is that the latter are impulsive with no rationale behind them, whereas ruminations are driven by an aversive ego-dystonic content. So apparent meaningful thought or rational self-statements may be examples of mental or "cognitive" tics, rather than obsessions. Even if intrusive thoughts are complex, their unwanted appearance may still be impulsive rather than intentional, and some intrusions may be a more complex version of cognitive tics. Both cognitive tics and obsessions need also to be distinguished from cognitive rituals. These are mental operations such as wiping away or suppressing or substituting intrusive thoughts as a way of neutralizing their impact. Mental neutralization is equivalent to the overt neutralization of compulsive rituals.

The "just right" phenomenon is a label applied to compulsions such as arranging books, or performing symmetrical movements, which seem to lack an obsessional precursor other than the need for everything to be "just right". According to Leckman et al. (1994/1995), it is a complex mix of high activation, sensory-perceptual sensitivity, doubting and repetitive action. This phenomenon could fall into the category of "cognitive tic" in the sense that the content is cognitive but the relief is experienced predominantly as a sensory fulfillment, and there are no external consequences. However, a careful psychological evaluation is necessary to effect such a differential diagnosis since although there may not be observable physical consequences to the "just right" ritual, there may be consequences for self-image and how the person feels about themselves if things are not "just right".

The notion of impulsivity and compulsivity as separate and opposing parts of a spectrum have come under close scrutiny. Firstly, the terms are vaguely defined and may be confusing states with traits. A trait of impulsivity includes a range of antisocial behaviors, not just a single impulsive action. Generally speaking, people with TS or TD do not have higher impulsivity than normal (Summerfeldt et al., 2004). The distinction between impulsive and compulsive actions might profit from an alternative division into automated (fast responses with minimal thinking) versus more controlled responses, which comprise in different degrees different stages of all actions. Here an impulsive act might be an automatic action, and a compulsive act more carefully controlled, but the difference is at the level of the act, not the personality trait (Table 1.3).

Table 1.3   Cognitive-behavioral differences between TS and OCD

Tics in Tourette's syndrome	OCD rituals
Action not goal-directed and regulates "feel" and sensery release	Action goal-directed and aims to neutralize obsessional doubt and anxiety
High chronic level of peripheral and central motor activation (e.g., muscle tension)	Normal arousal except under conditions of stress hyperfunctionality in cognitive/attentional systems
Distinct tics can substitute for each other	Distinct rituals rarely substitute for one another
Onset linked to behavioral activity and tension	Onset linked to intrusive thoughts
Predominant emotion at tic onset is frustration/impatience/dissatisfaction	Predominant emotion preceding compulsive activity is anxiety
Perfectionism in personal organization and personal standards	Perfectionism concerns doubts about actions, concern over mistakes
Over-active style of planning action	Normal style of planning action but more effortful
Respond to awareness training and relaxation therapy	Do not respond to relaxation and awareness training

Source: Adapted from O'Connor (in press) Contrasting Tourette's Syndrome and tic disorders with OCD. In: Abramowitz & Moats (eds), *Handbook of Controversial Issues in Obsessive-Compulsive Disorder*. Kluwer Academic Press.

Shapiro and Shapiro (1986) argued that it is precisely the confusion between impulsion and compulsion that results in erroneous rates of comorbidity between OCD and TD. Impulsions, according to Shapiro and Shapiro (1986), give pleasure – feelings of guilt and regret only arising later – whereas compulsions cause anxiety and tension. Shapiro's distinction between the impulsive-type rituals found in TS and the "genuine" compulsions of OCD has been incorporated into the clinical questionnaire mentioned earlier and designed to distinguish TS-type compulsions from OCD compulsions (George et al., 1990). The TS rituals, according to George et al. (1990), tend to be ego-syntonic, impulsive and directed to the self, whereas obsessional compulsions are more elaborate, ego-dystonic and world-directed actions like cleaning or checking (see Table 1.2 on p. 5).

Cath et al. (2001a, 2001d) have carried out a series of studies aimed to distinguish TS/TD from OCD symptoms. A factor analysis ($n = 92$) of TS/TD, OCD $\pm$ TD and OCD only revealed distinct compulsive and impulsive factors. The OCD group scored higher on the compulsive factor, and the TS/TD group scored higher on the impulsive factor. When OCD $-$ TD were compared to OCD $+$ TD, the former scored higher on obsessionality. TS/TD patients reported more echophenomena, trichotillomania, touching, symmetry behavior, self-injurious behaviors, but less checking, repeating and rumination. Self-injurious or aggressive thoughts were experienced as non-anxiety-related. The OCD patients reported more washing behavior. Müller et al. (1997) reported echophenomena to be predictive of TS in 56%

of cases when compared to OCD. Cath et al. (2001a) found that the presence of touching behaviors accurately predicted diagnosis of TS in 77% of cases and echophenomena predicted 83% of TS. OCD and TS groups may have similar thoughts but TS patients show more playfulness with their thoughts, while those with OC show more anxiety. Shapiro et al. (1988) have argued that repetitive thoughts and actions in TS patients are performed automatically as a consequence of a failure to restrain impulses and are not anxiety-related. A questionnaire designed by George et al. (1990) explicitly distinguishes the sensory-based overt and covert rituals of TS patients from the more intentional obsessions of OCD patients. Cath et al. (2001d) also note the importance of distinguishing cognitive tics from mental obsessions. Cognitive tics are playful and are usually aimed at tension reduction rather than harm avoidance.

► EMOTIONAL ASSOCIATIONS

Tics in common parlance are considered "nervous" tics, but the associated emotions at the time of tic onset are mainly frustration, impatience and dissatisfaction rather than anxiety (O'Connor et al., 1993). Although a recent study did report a correlation between the number of tics and self-reported anxiety level (Woods et al., 1996b), people with TD are not more neurotic as measured by the *Eysenck Personality Inventory* (O'Connor et al., 1997a).

Although the literature specifically addressing self-esteem is sparse, one speculative hypothesis may be that clients with TD are preoccupied by how they are perceived by others, and clients with OCD have a more pervasive lack of self-confidence and are preoccupied more by their performance in general in the world. The difference noted above in the type of OCD rituals experienced in those with TS + OCD and those with just OCD suggests less fear of consequences in TS. The TS + OCD group seem to experience less contamination and washing rituals and more symmetry and ordering.

The client with TD rarely has concerns about performance efficacy, but seems overly preoccupied by the judgment of others about his or her appearance and self-image (O'Connor et al., 1993). Christensen et al. (1993) have noted that in other impulsive disorders (e.g., compulsive buying), the person's self-esteem seems to depend unduly on the response of others.

Thibert et al. (1995) reported that clients with TS and OCD had a higher degree of self-consciousness coupled with social anxiety than clients with TS without OCD. But both groups had low self-satisfaction and self-esteem. In TD, unlike in OCD, the very thought of experiencing a negative self-evaluation can provoke the tic. Watson and Sterling (1998) note in the functional analysis of a case of a vocal tic that social attention was a precipitating factor. On the other hand, in OCD, it is often the self-oriented interpretations placed on the obsession, e.g., that the person should control it or should not have such thoughts, that may maintain the obsession (Clark, 2004).

A key distinction between tics and OCD compulsions is the emotional experience at the time of doing the tic or OCD ritual. A person with an impulsion experiences

pleasure from the deed (Hoogduin, 1986), whereas someone committing a compulsive act experiences anxiety and tension which is temporarily relieved by the neutralization. Shapiro and Shapiro (1986) originally noted that impulsions give pleasure, with feelings of guilt and regret only arising later. Cath et al. (1992a) found that the key differentiator between OCD and TS was indeed "felt emotion". Clients with OCD, according to these authors, always found thoughts unpleasant, whereas clients with TS often felt a relief from tension, and even a neutrally affective playfulness after the tic. The evolution of emotion in simple tics tends to follow the pattern of immediate frustration and tension, with the tic inducing temporary short-term relief from tension but leading finally to renewed tension.

In a habit disorder, clients can report a clear sense of activation during the hair pulling (King et al., 1995). There may be a neurochemical basis for suggesting that tic movements affect the person in a milder but similar way to stimulants, such as nicotine, and may both act on the catecholamine system (O'Connor, 1989; Peterson et al., 1994). There is some evidence of substitution between cigarette smoking and tics. Tics *can* become more intense after smoking cessation (Peterson et al., 1994) and nicotine procalix has been found somewhat effective in reducing tic frequency (McConville & Norman, 1992; Richards, 1992). Sanberg et al. (1997) suggest that transdermal nicotine could serve as an effective aid to neuroleptic medication in TS.

Miele et al. (1990) have argued that a number of behavioral syndromes, especially compulsive and impulsive disorders, appear to share descriptive similarities with chemical dependence. Availability of alternative rewards to replace the tic-induced stimulation seems crucial to success in relapse prevention and even more so in the treatment of HD such as hair pulling (Azrin & Peterson, 1988a, 1988b). The next sections discuss, in more detail, differences in psychological management strategies.

► SELF-MANAGEMENT STRATEGIES

The problem behavior is self-managed and resisted in TD. Self-management strategies employed in TD serve the same purpose of suppression, delaying or disguising the problem behavior and are counterproductive in producing both increased tension and desire to perform the tic/ritual. Clients with TD are capable of suppressing tics completely for shorter or longer intervals. The most common strategies adopted are: tensing of muscles antagonistic to the tic muscles which can block the movement; tensing of the general area where the tic takes place; changing posture, suppressing or delaying onset; attempting to hide the tic by disguising it with another movement (see Wojcieszek & Lang, 1995). The result of these strategies is often extreme discomfort and an increased desire to tic, but the tic is temporarily impeded and so the outward impression is one of normality. Although the difficulty of suppression varies between clients in TD, the counterproductive effect is similar. If, instead of suppression, the person is encouraged to step back and let the urge flow by unimpeded and without censure, some of the associated sensation is alleviated. Relaxing muscles instead of tensing them to resist the tic