# TOURETTE SYNDROME: CLASSROOM IMPLICATIONS

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## ABSTRACT

Tourette Syndrome (TS) is a neurobiological disorder characterized by various involuntary motor movements and vocal tics. Symptoms of TS emerge between the ages of 3 to 8 years old, are most severe when an individual reaches puberty, and decrease by the time a person is 20 years old. Additionally, persons with TS may have secondary disabilities of obsessive-compulsive disorder, attention deficit hyperactivity, and/or learning disabilities. Challenges occur when students with TS or with TS plus secondary disabilities become members of the general education classroom. This article provides information to assist teachers and staff in the general education setting to successfully include the child with TS.

## TOURETTE SYNDROME: CLASSROOM IMPLICATIONS

Tourette Syndrome (TS) is a neurobiological disorder characterized by various involuntary motor movements and vocal tics. Symptoms of TS begin

to appear between the ages of 3 and 8 years and are most severe when an individual reaches puberty (Shavitt et al., 2006). However, symptoms usually decrease in severity by the time a person reaches the age of 20 years. More boys than girls have TS, with an estimated prevalence rate of 1-10 in every 1000 (Thomure, 2007). According to the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text revision, 2000), in order to receive a diagnosis of TS the following conditions should be met:

1. Both multiple motor and one or more vocal tics have been present at some time during the illness, although not necessarily concurrently. (A *tic* is a sudden, rapid, recurrent, nonrhythmic, stereotyped motor movement or vocalization.)
2. The tics occur many times a day (usually in bouts) nearly every day or intermittently throughout a period of more than 1 year, and during this period there was never a tic-free period of more than 3 consecutive months.
3. The onset is before age 18 years.
4. The disturbance is not due to the direct physiological effects of substance (e.g., stimulants), or a general medical condition (e.g., Huntington's disease or postviral encephalitis). (p. 114)

## TYPES OF TICS

In the research literature, tics are defined as sudden, involuntary, intermittent, repetitive and stereotypical movements, gestures, and verbal sounds (Kenney, Kuo, & Jimenez-Shahed, 2008; Shavitt et al., 2006). Involuntary motor movements and vocal tics in individuals with TS can range from simple eye blinking and throat clearing to more complex motor movements or tics such as violent movements of the head and blurting out verbal abuses (Christner & Dieker, 2008; Holtz & Tessman, 2007). Tics are categorized as simple or complex based on the number of muscles and/or body parts included in the occurrence (Hansen, 1992). Simple motor and vocal tics consist of brief, isolated and rapid movements and sounds. For example, eye blinking, head movement, sniffing, and throat clearing are simple tics. Complex motor and vocal tics, on the other hand, are more intricate in nature and involve more than one muscle or body part during the same event. Examples of complex tics include hopping, hitting, and repeating a word or phrases such as "that's sweet" or "neat." Table 1 provides a list of motor and vocal tics.

Tics can differ in frequency, time of occurrence, and severity. Tic behavior can change over time by the addition of new tics to the individual's repertoire or the replacement of old tics with new ones (Christner & Dieker, 2008). All tics tend to be most severe when an individual is stressed, anxious, excited, or tired. Contrary to the general perception that all individuals with TS blurt out verbal abuse and obscenities (coprolalia), only 10-15% of individuals with TS have vocal tics that are of this nature. Some individuals with TS may have copropraxia, which refers to tics that are comprised of inappropriate social movements and gestures, such as flipping the middle finger. A third type of tic is known as echopraxia, where an individual imitates other people's gestures and movement (Kenney, Kuo, & Jimenez-Shahed, 2008).

According to the DSM-IV-TR (2000), there are three main categories of tic disorders: (1) Chronic Motor and Vocal Tic Disorder, (2) Transient Tic Disorder, and (3) Tourette's Disorder. They all have different diagnostic criteria and differ based on duration, variety, and age of onset (DSM-IV-TR, 2000), but the presence of involuntary vocal or motor tics defines all three. Table 1 organizes tics by motor or vocal tics and by simple or complex within each category.

Table 1.

*Types of tics.*

| MOTOR TICS | | MOTOR TICS | |
|---|---|---|---|
| *Simple:* | | *Complex:* | |
| eye blinking | head movement | licking | kicking |
| neck- jerk | finger movement | jumping | hopping |
| hand-jerk | touching hair | hugging | hitting |
| leg -jerk | touching face | kissing | biting |
| facial twitching | shoulder shrugging | pinching | obscene gestures |
| sticking tongue out | | cutting | touching others |
| | | spinning | |
| VOCAL TICS | | VOCAL TICS | |
| *Simple:* | | *Complex:* | |
| burping | sniffing | hissing | repeating words |
| hiccups | humming | barking | repeating words |
| coughing | chirping | meowing | echolalia |
| grunting | snorting | coprolalia (abuse, racial, religious and | |
| swallowing | throat clearing | ethnic slurs) | |
| | | palilalia (repeating one's own words) | |

## TS AND COMORBIDITY

It is often difficult to diagnose TS because it is accompanied by other disabilities such as Attention Deficit Hyperactivity Disorder (ADHD), Obsessive Compulsive Disorder (OCD), anxiety disorder, and Learning Disabilities (LD) (Kenney, Kuo, & Jimenez-Shahed, 2008; Kutscher, 2005; Robertson et al., 2002; Sukhodolsky et al., 2003). Research indicates that approximately 50% of individuals with TS show symptoms of ADHD which results in interference with their ability to stay focused and concentrate on everyday activities (Rothenberger et al., 2007). According to Mansueto and Keuler (2005), twenty-sixty percent of individuals with TS also has been identified as having OCD, while other authors estimate that the co-existence of OCD with TS includes anywhere from 20-60% of individuals identified as having TS (Chang, McCracken, & Piacentini, 2007). The impact of OCD with TS results in further complications in their success with daily activities (Hansen, 1992). Although most persons with TS have been identified as having average intelligence (Prestia, 2003), almost 40% have also been noted to have learning disabilities (Burd, 1992; LinguiSystems, 1999).

According to Freeman et al. (2000), individuals with TS who also have other co-existing conditions often have more difficulty controlling anger, have more problems with sleeping, and have higher levels of self-injurious behaviors than students who are identified with TS alone. Compared to students who have been identified with TS only, students who have TS and ADHD or OCD have more problems controlling inappropriate thoughts and behaviors. In addition, the presence of ADHD or OCD in individuals with TS may result in a higher risk for difficulties with motor skills as well the presence of intellectual and executive deficits in the areas of problem solving, decision making, and focusing attention (Ozonoff et al., 1998). In a study of 207 students who had TS only, TS and ADHD, and ADHD alone, Sukhodolsky et al. (2003) reported that students with TS and ADHD exhibited more frequent disruptive behaviors when compared to students with only TS. They further reported that students with TS and ADHD had similar levels of aggressive and delinquent behavior as students who had ADHD only. In another study, Bawden et al. (1998) found that students with TS and ADHD had higher levels of aggression, and were more likely to have peer problems and difficulty compared to students who only had TS.

## SOCIAL-EMOTIONAL ISSUES ASSOCIATED WITH TS

A significant area for students with TS is the social-emotional aspect, as students with TS are seen to have difficulty in the area of social and emotional well being (Chang, McCracken, & Piacentini, 2007). These problems are based on the

negativity associated with the presence of tics and often include low self-esteem and social withdrawal. According to Holtz and Tessman (2007), "tics can be perceived by others as bizarre, hostile or inappropriate" while the "obvious physical symptoms of the disorder may decrease opportunities for social interaction due to the negative reactions of peers" (p. 532). Many students with TS become the subject of teasing by their classmate and are vulnerable to developing social and emotional difficulties as a result (Carter et al., 2000). In a study conducted by Boudjouk et al. (2000), 51 participants who viewed videos of actors exhibiting a tic disorder and a second video of actors who did not exhibit such disorder rated actors portraying the tic disorder as significantly lower in terms of social acceptability. In another study by Stokes et al. (1991), peers rated their class counterparts with TS as less popular and more socially withdrawn. In addition, students with TS may form fewer friendships compared to their peers without TS. This may result in stigmatization that stems from exhibiting tics and can lead to social difficulty and limitations on their social experiences (Woods & Marcks, 2005).

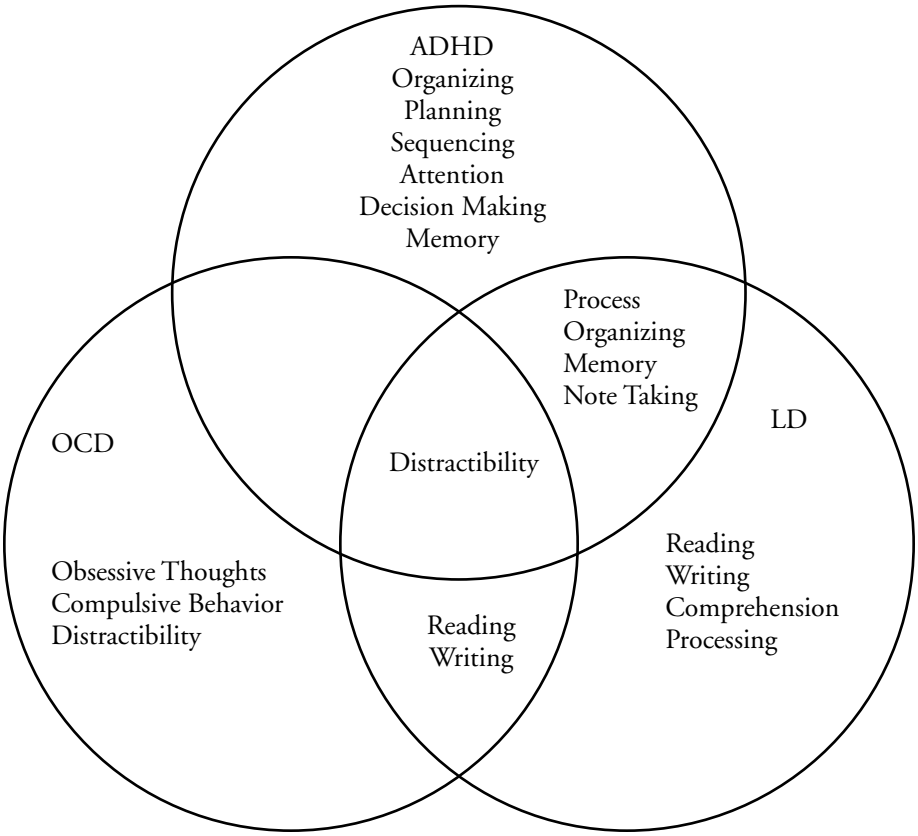
Students with TS may become anxious in social situations due to the uncontrollable and erratic nature of their tics (Seligman & Peterson, 1986). Other students with TS may become anxious because they can sense an impending tic, but are incapable of preventing it. In some instances students can temporarily suppress the tic. However, when the tic does occur, it is often more severe (Christner & Dieker, 2008). To shield themselves from unpredictability in the exhibition of tics, students may withdraw socially. The results of this withdrawal are often that students experience depression, low self-esteem, and a lack of self-confidence (Seligman & Peterson, 1986).

## CLASSROOM IMPLICATIONS

As a result of these varying differences in the manifestation of TS and its possible accompanying disabilities, classroom teachers need to consider the implications for success in their classroom. It is essential for teachers to recognize that the majority of students with TS have average or above average intelligence (Prestia, 2003). Tics are involuntary in nature and asking the student to control tics from occurring will only exacerbate the conditions. When examining the functionality of co-existing conditions such as LD, OCD, and ADHD, teachers often find that the areas of challenge may be the same even if sources of the difficulty differ. For example, writing by hand may be difficult for students with LD because of motor issues, for students with OCD because of intensity of the focus and desire for perfection, and for students with ADHD because of the lack of focus and distractibility. Table 2 demonstrates the overlap of characteristics among OCD, LD, and ADHD.

Table 2.

*Characteristics Overlap.*




Regardless of the nature and severity of their tics or the presence of co-existing disabilities, students with TS will need to receive appropriate academic support and accommodations to be successful in the classroom. Teachers often examine the classroom environment which includes social-emotional climate, physical arrangement, schedules and routines, and instruction and assessment to determine how to support students with disabilities within the general classroom. This same schema is effective in

determining strategies to support students with TS within the classroom environment.

## SOCIAL-EMOTIONAL CLIMATE

The impact of TS, especially the impact of the uncertainty of involuntary tic occurrence on the social and emotional life of individuals, often results in one of the most debilitating aspects of this disorder, that of low self-esteem and social withdrawal. Therefore, the first step is the creation of a safe and caring classroom environment where the student does not feel threatened or ostracized because of tics. As a result of a lack of knowledge and understanding of tic behavior, the student's peers might view the student with TS negatively. Holtz and Tessman (2007) agree, stating that "Children's misinformation, fear, and feelings of dissimilarity toward individuals with disabilities may create negative attitudes" (p. 533). Teachers should encourage the acceptance of the student with TS and work with the other students to reduce their negative attitudes. In addition, students can be informed about TS by showing media and reading books that portray individuals with TS in a positive light. Teachers might ask the student with TS and/or the parent to share experiences as part of the classroom activities. Other students would have the opportunity to ask questions about TS, thereby addressing their questions and concerns in a safe environment. Table 3 lists some educational resources appropriate for both teacher and students to explore and learn more about TS.

According to Donaldson (1980), interactions with persons having disabilities can change negative perceptions and attitudes. Teachers should model positive interactions when communicating with all students in their classrooms. Classroom activities where students can interact with the student with TS within a supportive, structured, and supervised environment are imperative. Pairing the student with TS with another student in the classroom on class assignments, projects, and other social activities can provide time for goal-directed, positive exchanges for those involved.

## PHYSICAL ARRANGEMENT

The classroom arrangement can be a determining factor in how effectively a student with TS functions within a classroom. A classroom cluttered with desks and chairs limits space for the student with TS to move around and expend energy. Similarly, the students in the seats next to the student with TS are also an important consideration. These students need to be peers who are

Table 3.

*Educational Resources.*

| Additional Resources on Tourette Syndrome |
|---|
| Video<br>*I have Tourette's, but Tourette's doesn't have me*<br>(This and other learning resources for education and allied professional are available on the Tourette Syndrome Association website www.tsa.usa.org) |
| Books |
| Chowdhury, U. (2004). *Tics and Tourette Syndrome: A handbook for parents and professionals.* London: Jessica Kingsley. |
| Dornbush, M., & Pruitt, S. K. (1995). *Teaching the tiger: A handbook for individuals involved in the education of students with attention deficit disorder, Tourette Syndrome or obsessive compulsive disorder.* Duarte, CA: Hope Press. |
| Haerle, T. (1992). *Children with Tourette Syndrome: A parents' guide.* Rockville, MD: Woodbine House. |
| Leckman, J. F., & Cohen, D. J. (1999). *Tourette's Syndrome—Tics, obsessions, compulsions: Developmental psychopathology and clinical care.* New York: John Wiley & Sons, Inc. |
| Niner, H. L. (2005). *I can't stop! A story about Tourette Syndrome.* Morton Grove, Illinois: Albert Whitman & Company. |
| Scheuermann, B., & Hall, J. A. (2007). *Positive behavioral supports for the classroom.* Upper Saddle River, New Jersey: Prentice Hall. |
| Shimberg, E. F. (1995). *Living with Tourette Syndrome.* New York: Fireside. |
| Websites<br>www.tsa-usa.org<br>(Tourette Syndrome Association) |
| http://www.ninds.nih.gov/disorders/tourette/tourette.htm<br>(National Institute of Neurological Disorders and Stroke) |
| http://tourettesyndrome.net/<br>Tourette Syndrome plus |

accepting of differences. When tics occur or when stress arises, the student with TS could go to a pre-identified safe area either inside or outside the classroom. Having a safe place provides a private retreat for the student with TS to practice other stress reducing options such as relaxation techniques or

listening to comforting music. In addition, the student with TS can use the safe place between activities to calm, regroup, and reduce stress and, possibly, the occurrence of tics.

## SCHEDULES AND ROUTINES

Scheduling is another important aspect of supporting a student with TS. The student's stamina must be considered when planning student activities and assignments. Since tics are often more severe and more frequent when a student is tired, fatigued, or excited, lessons and activities that require close attention should be scheduled earlier in the day. Activities that are interesting to the student with TS can be scheduled later in the day since tics decrease in severity and occurrence when individuals are engaged in activities that are enjoyable and of interest.

Another factor in scheduling is the disruption of the classroom routines. Many students with TS have difficulties with changes in schedules, routines, or activities. Although most students have a positive reaction when presented with pleasant surprises, students with TS do not cope well with surprises, even pleasant surprises. When making changes in daily activities, it is best to inform a student with TS in advance. Teachers can incorporate 'alert' strategies into the class routines to help the student prepare for upcoming schedule changes. For example, in elementary grades, the school day could begin with a "sharing time" when students can review the activities planned for the day. In the middle grades, students can be encouraged to keep daily calendars. Teachers can announce differences in the daily routine in advance and place the changes in the students' calendar. At the high school level, teachers can post changes in the daily routine on the announcement board or the blackboard in advance, thereby preparing the students for the altered routine. By making these strategies a part of the classroom routine, no student will feel "targeted" for being different.

## INSTRUCTION AND ASSESSMENT

As previously mentioned most students with TS have average intelligence but may still require appropriate support and accommodation to succeed in class. Sometimes the academic problems that the student encounters may not be a function of the TS, but may be related to the other co-existing disabilities as discussed earlier. In order to provide appropriate support and accommodations, teachers should first review the student's records to determine whether patterns of behavior can be identified. Once this is completed then the teacher should observe the student to discover if present actions or specific situations within the classroom may be interfering with the student's success. For example, the teacher

could ask the following questions: Is the student easily distracted and unable to focus on the task? Does the student demonstrate obsessive thoughts? Is the student engaging in compulsive behavior? Does the student seem stressed? Does the student have inordinate amounts of energy? Is the student spending excessive time on attempting to control tics? After answering these questions and observing the student during class, a plan addressing these behavior(s) can be developed.

Most students with TS have some common underlying behaviors that may interfere with success in the classroom. One frequent issue is difficulty in beginning and completing assigned activities. Teachers can address this problem by identifying and providing pre-determined cues to remind the student to start or continue to work. To assist with task completion, assignments, tests, and homework can be divided into smaller segments that may be easier for the student to complete in a timely manner.

Students with TS may be uncomfortable when answering questions posed to the whole class. This discomfort may be caused by anxiety and worry that tics will occur when answering the teacher's question. To enhance the student's comfort and thus classroom success during oral questioning, the teacher and the student can pre-arrange a signal for occasions when the student is ready to respond. The teacher might also arrange for an "alert" signal so that the student with TS is aware that he/she will be asked a question. An example of an alerting behavior is the teacher standing in front of, or next to, the student just prior to calling for his/her participation. Another alert signal is the teacher placing a printed question on the student's desk one question before calling on the student. Prior knowledge of the questions can also help with student comfort. Before class begins the teacher can also provide the student with a list of any questions that might be asked, and then, before asking one of these questions, the teacher can move to stand next to the student. Each of these teacher actions provides the student with TS the opportunity to prepare for oral recitation thereby lessening stress and subsequent tic occurrence.

Students with TS often display difficulty with handwriting. In today's classroom, an easy solution is to allow students the use of a computer or a recorder. When taking notes, a student with TS may again encounter difficulties in focus, handwriting, and speed. The student can record the lecture, thereby allowing total attention to the lecture. Or teachers could provide notes about the topic to the student with TS or prepare note-taking helps such as structured note blanks, Venn diagrams, or summary sheets. Note-taking sheets are often used within the classroom as a content organizational tool.

Another common issue for many students with TS is taking tests. Test taking can result in high levels of stress and anxiety and thus increase the chances of tic occurrence. When administering tests to a student with TS, it may be beneficial to provide extended time or a reduction in the number of

test items. For students slowed because of handwriting issues, another solution is the use of the computer or the recording of answers. Students who are distracted easily also may have difficulty during test time; so, providing an environment with fewer distractions helps that issue. Any solution that can reduce student stress will be beneficial to the student and the teacher.

## MEDICATION

Most students with TS take medications to help control tics. It is also common practice for medication to be prescribed for the co-existing disabilities such as ADHD, OCD, anxiety, or depression. In some cases, these medicines can produce side effects including lethargy, irritability, and inattentiveness that impact the student's success in the classroom. To address this possible problem area, parents need to provide an initial list of the student's medications to the teacher and school nurse and to up-date the list whenever medication is changed. It is essential that teachers are aware of the medications taken by all students in their classes as they can affect whether successful behaviors are being exhibited in school.

## TEACHER-PARENT COLLABORATION

Parents are an indispensible resource for teachers as they can help inform the school faculty and staff about TS. Additionally, parents know their children and will know things that can help the teacher to educate their child more successfully. They will also be able to advise the teacher on the student's at-home behaviors. Sometimes, students with TS suppress their tics in school and then have numerous episodes when they go home. In such cases, teachers and parents may be able to discover a method to support the children both in school and at home. Questions that both parents and teachers can consider are (1) How are tic(s) affecting the student in school or at home? and (2) Is there a particular way to help when a tic episode occurs? In addition, parents and teachers can share information identifying those events that cause stress for the student at each location, along with how to prevent those events, or, if they are not preventable, how to help the student cope with those types of events.

Professional practice demands that teachers communicate with parents as much as possible. As with many students, it is important for the parents to know if the student with TS has had a good or bad day at school. To do this, teachers can send brief notes or emails, or make telephone calls to parents telling them about the student's school day. Then when the student arrives home, parents can be prepared. Likewise, parents should notify schools if there are significant issues occurring at home. School-parent collaboration is the key to success for students with TS.

## CONCLUSION

Teachers should remember that each student with TS is different and that the student's tics may change in nature and severity with time; each student is seen as an individual. Teachers need to plan to challenge each student's areas of strength and provide supports to assist in overcoming areas of weakness. Teachers need to see beyond the disability and see the student as an individual. The student is dependent upon the teacher for support and acceptance. The teacher must be the model of tolerance in the classroom.

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