T

24-hour care

►Group Homes

T Scores

►Norm-Referenced Scores
►Standard Scores

Tabula Rasa

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Synonyms

Blank slate

Definition

Tabula Rasa (Latin: Blank Slate) refers to the concept that humans are born with no native abilities, knowledge or mental capacity, and that our entire set of knowledge and skills at a given time are a product of our sensory perception and experiences up to that point in time. In the nature versus nurture controversy, proponents of the nurture position generally promote the concept of tabula rasa.

Tactile Stimulation

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Synonyms

Contact; Touch

Definition

Touch has been described as the most fundamental means of contact with the world, and the simplest and most straightforward of all sensory systems. Tactile stimulation is vital in several domains of the infant's and child's life, including social, cognitive, and physical development.

Description

Touch has been described as the most fundamental means of contact with the world [2], and the simplest and most straightforward of all sensory systems [7]. Touch is vital in several domains of the infant's and child's life, including social, cognitive, and physical development (e.g., (5)). In fact, touch is the first sense to develop in utero and by 14 weeks after gestation, the surface of the fetus is almost entirely sensitive to tactile stimulation. Touch continues to play a central role in adulthood when flirting, expressing power, soothing, playing, and maintaining proximity between child and caretaker [4]. By adulthood, the skin constitutes the largest organ of the body, covering 1.8 m^2 of the average person. As with humans, touch serves many functions in non-human primates as well. Different species groom to reconcile following aggressive encounters, to initiate sexual encounters, to reward cooperative acts of food-sharing, to maintain proximity with caretakers, and to sooth conspecifics in stress [3].

The Physiological Underpinnings of Touch

As mentioned, the skin is the largest organ of the human body and weighs between six and ten pounds [11]. The skin is a multilayered structure containing several receptors, each of which sends unique signals to the brain through neurons via the spinal cord. Information from the spinal cord enters the thalamus – the "relay station" of the brain – which then sends this input to a strip of the brain called the somatosensory cortex located on the parietal cortex. The more area on the somatosensory cortex that is dedicated to a given area of skin on the body, the more sensitive that area of skin is to tactile stimulation. Thus, areas of the body such as the fingers and lips – two of the most sensitive areas of the body to tactile stimulation – are well represented on the somatosensory cortex compared to less sensitive areas of the skin such as the back.

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Learning About the World Via Touch

Throughout life, we actively explore the world with our hands to learn about objects in the world – a process known as haptic perception [10]. Haptic perception, in conjunction with vision, is particularly important for infants to learn about the world. Research indicates that by 3 months of age infants can distinguish objects by size and shape (e.g., a cube from a hollow square), by 6 months of age they can distinguish objects by hardness and texture, by 9 months of age they can distinguish objects by weight, and by 15 months of age they can distinguish between shapes that are similar in features but differ in spatial arrangement.

Effects of Touch on Biology

Touch plays an instrumental role in brain development and growth, especially in early life [5]. Without adequate tactile stimulation early in life, the brain does not grow to a normal size and the synapses between neurons do not develop properly. In addition, adequate tactile stimulation early in life can buffer the effects of tactile deprivation later in life. Thus, exposure to adequate amounts of touch early in life seems to form a foundation for later nervous system development.

The importance of touch does not wane later in life. Research indicates that when nonhuman animals are provided extra tactile stimulation later in life, their brains increase in size and the synapses between neurons increase. Moreover, tactile stimulation can help stimulate neuronal growth due to brain lesions and infarcts in the brain later in life. In addition to studying the effects of touch on the brain, researchers have investigated the effects of touch on premature infants' growth. In one study a group of premature infants received a 10-day protocol of massage therapy comprised of tactile/kinesthetic stimulation while a control group did not receive the massage therapy protocol [6]. Compared to the control group, the treatment group gained 47% more weight, was more active and alert, and spent six fewer days in the hospital.

Effects of Touch on Cognition, Emotion, and Social Interaction

Tactile stimulation has a significant impact on cognitive development [8]. A wide body of literature suggests that cognitive development is intimately tied to brain development in the childhood years and, as mentioned, touch plays a pivotal role in neuronal development in the early years of life. Parental aversions to touch as well as harsh touch have been implicated as factors in the development of language and learning disorders. In addition, research suggests that parents who use touch to stimulate the central nervous system regularly and appropriately have children that are more likely to develop an accurate and sophisticated body image. These parents provide a variety of forms of tactile stimulation to a number of areas on the body.

Touch plays an integral role in the caregiver-child relationship from the beginning of life. In one U.S. sample, infants were touched for 33–61% of the time during brief interactions with their mothers. The frequency of contact is much higher in some cultures such as the !Kung and the Efe tribe of Zaire where mothers spend approximately 75% of the time in contact with their infants [8].

In infancy, caregivers' touch is thought to serve a variety of communicative functions while they are in contact with their infants [8]. Two of the most important are the communication of emotions, as well as the communication of security. A number of studies indicates that touch is capable of communicating and eliciting positive and negative emotions. One powerful demonstration of the power of touch to elicit positive emotions has been shown when researchers use the "still-face paradigm" to study infant emotionality. The still-face paradigm is comprised of a period of interaction when the caregiver assumes a still-face, thereby not responding to the infant's actions. During this period, infants typically react negatively because this is an unusual event in most infants' lives. Several studies indicate that if caregivers touch their infants during the still-face period, their infants' emotional displays are significantly less negative and more positive compared to infants who are not touched during the still-face period.

The quality of caregiver-infant touch is a central feature of the responsive and available caregiving environment that is necessary to foster an infant's sense of security. Several studies suggest that touch between the caregiver and infant is the "ultimate signal" of security of the infant. In one experimental study, researchers compared how infants were attached to their caregivers when they carried their infants ventrally in soft infant carriers versus those who were carried in harder infant seats [1]. The researchers found that infants carried in the soft infant carriers were significantly more likely to be securely attached to their caregivers than infants who were carried in the infant seats. This study and others strongly suggest that touch plays a key role in the communication of security to children.

Touch continues to play an integral role in social communication in adulthood [9]. For example, touch communicates power and emotions to others, as well as aids in persuading others to comply with our requests. In addition, touch increases verbal interaction among people, gains attention from others, and communicates our attraction toward others.

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Tales

►Personal Narratives

Task Goals

►Mastery Orientation

Task Involvement

►Mastery Orientation

Task Orientation

►Mastery Orientation

TAT

►Thematic Apperception Test

TBI

►Traumatic Brain Injury

Teacher Report Measures

►Behavior Assessment System for Children: Second Edition (BASC-2)

Teacher Student Relationship

►Classroom Climate

Teacher-Child Relationships

►Relationships

Teacher-Expectancy Effect

►Pygmalion Effect

Team Assisted Individualization (TAI)

►Cooperative Learning

Teams-Games-Tournaments (TCT)

►Cooperative Learning

Teen Mothers

►Adolescent Mothers

Teenage Mothers

►Adolescent Mothers

Teenagers

►Adolescence

Teens

►Adolescence

Television

►Media

Temper

►Mood

Temper Tantrums

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Synonyms

Aggressive behavior problems; Behaviorally disorganized children; Children of high emotionality; Difficult children; Inflexible-explosive children [3]

Definition

Temper tantrums are defined as "disruptive or undesirable behavior of emotional outbursts displayed in response to unmet needs or desires, or an inability to control emotions stemming from frustration or difficulty expressing the particular need or desire" [8].

Description

Temper tantrums are among the most common behavioral problems of young children reported by parents, specifically between the ages of 18 months to 4 years. Tantrums are often expressed with crying and in less-common cases with attention-getting events such as breath holding and head banging. Parents often talk about their children grunting and growling while other children make sounds similar to animal cries. Because of screaming too loudly and for so long there are cases in which children's cheek capillaries burst and their eyes become bloodshot. In extreme cases, children yell until they vomit or become inflexible and rigid [5]. During temper tantrums children may also engage in actions such as limb-flailing or foot-stomping, and if language is more developed, abusive and blasphemous words may be screamed in a violent flow of anger. During these moments children are described as demanding, unrestrained, infuriated, egocentric and omnipotent and resist any form of control [3].

Researchers underline the importance of distinguishing between disruptive behavior and normative misbehavior in preschool children. "Normative misbehaviors," such as aggression and tantrums, are exhibited by 75% of children by age 2. However, in many cases, noncompliance, temper loss and aggression are signs of disruptive behavior disorders. In order for this differentiation between normative and non-normative misbehavior to be successful, direct assessment observation is needed, either in clinical laboratories or in natural settings [7].

Temper tantrums usually develop in stages: during the first stage the tantrums start with early warnings about possible problems, afterwards the actual tantrum takes place and lasts for some minutes and finally there is a period of "hangover," when the child returns to a stable condition, after feeling tired [8]. Additionally, during tantrums, angry behaviors and shouting occur first, while sobbing occurs later on [5].

Research findings have revealed that healthy children usually demonstrate less violent, self-injurious, destructive and orally aggressive tantrum behaviors than children who meet the diagnostic criteria for mood and disruptive disorders. Furthermore, healthy children's tantrums are shorter and less severe and require less recovery time. However, researchers argue that these results cannot in any case cover the importance of individual differences in emotional development [1].

Additionally, 5 high risk tantrum styles are identified which may form the basis for determining typical versus atypical tantrum behaviors and therefore help us decide whether mental health evaluation is needed. According to the first tantrum style, consistent aggression against

caregivers or objects is displayed. In the second style, which should be considered extremely serious and is not common, children engage in self-injurious behavior during tantrums. Children falling in the range of the third tantrum style, meaning that they display 10–20 tantrum episodes in a 30-day period or have more than 5 tantrums per day, are at risk for having a serious clinical problem. In the fourth style, tantrums have a long duration, lasting 25 min or longer on average. Finally, in the fifth style, children are unable to calm themselves, regardless of the length, intensity, context and the severity of the temper tantrum. It is important to note that tantrums related to unmet typical needs, such as sleep, hunger or illness, should not cause distress [1].

Many researchers tried to answer the question whether children who demonstrate temper tantrums are at risk for becoming ill-tempered adults. One of the biggest demands that the society poses on the developing child is the need to control impulses and regulate emotional expression. However, this achievement often depends on the child's ability for ego control. Research evidence indeed verified the hypothesis that ill-tempered children develop into ill-tempered adults. Longitudinal studies have revealed that children with a stable pattern of temper tantrums in early childhood usually face difficulties in many life tasks as adults. Both sexes were facing problems at the domain of work, in their marriages, in their roles as parents, in educational and military settings and they were more at a risk for divorce or conflict in their marriages [2].

Causes

People often raise the question why some children demonstrate tantrums while others seem immune to such expressions. Researchers have identified that factors such as temperament, defenses and coping competence for dealing with risks, danger, affect stimulation and tension/frustration are factors that are possibly related to the manifestation of temper tantrums [3]. They assert that they occur in early childhood as a result of a still immature ego but research findings also reveal that temper tantrums can sometimes prove to be signs of externalizing psychopathology in childhood and a predictor for antisocial behavior in older children. However, recent surveys have revealed that certain psychosocial factors, such as maternal depression, corporal punishment, low social class, minor illness and other behavior problems could be associated with extreme temper tantrums [4].

Intervention

Temper tantrums may often have a strong impact on parents. Specifically, in cases in which parents have to deal with tantrum behaviors which are repeated and prolonged, and in cases where object-destruction or acts of serious aggression are involved, parents are more probable to become irritated, frightened by their child's behavior or even anxious about their own feelings. That could be a possible explanation for why children with temper tantrums are more at risk for abuse. It could be helpful for parents to have an idea about the duration of their child's tantrums and how long a particular one might last because in many cases the parents simply have to wait for the tantrum to end, without interfering, and these moments can be extremely frustrating or anxiety-provoking [5]. Moreover, the role of parent training is emphasized as a successful intervention for children's explosive behavior. Research findings reveal the important causal role of parenting in antisocial behavior and delinquency. Observations and parent reports demonstrate that cases of unskilled parental discipline measures are linked to high tantrums in later childhood [6].

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Temperament

►Thomas and Chess Classification of Infant

Temporal Discounting

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Synonyms

Impulsivity; Self-control; Time-delay discounting

Definition

The phenomenon in which the value of a reward decreases as the time delay until its receipt increases.

Description

Temporal discounting refers to the phenomenon in which the subjective value of some reward loses its magnitude when the given reward is delayed (see [2]). Similar to the notion of "delayed gratification," relatively high degrees of discounting are synonymous with impulsivity. On the contrary, when individuals demonstrate a sustained interest and motivation in a delayed reward, they are said to have less discounting, and thereby more self-control. Temporal discounting may be measured via two assessment methods: (1) hypothetical choice trials or (2) choices with deliverable outcomes. During hypothetical choice trials, individuals are presented with the option between a hypothetical smaller sooner reward (e.g., $5 now) and some larger delayed alternative (e.g., $10 in a week). These hypothetical choices are then titrated to find the amount in which the delay is no longer tolerable and the smaller reward becomes more preferred. While offering an actual delivery of the chosen reward alternative would be a seemingly more valid indicator of discounting, many procedural limitations exist precluding its utility. For one, hypothetical rewards do not compound across multiple choice trials, as actual rewards would become cumulative and confound the direct relationship between a delay duration and reward magnitude.

Relevance to Childhood Development

As a behavioral indicator of self-control and impulsivity, temporal discounting has been found to serve a discriminant function in adolescents in identifying students with attention deficit hyperactivity disorder and oppositional defiant disorder [1]. That is, students with these disabilities scored as more impulsive on discounting assessments. In addition, children with better self-control on discounting measures have been found to have greater verbal intelligence quotients on norm-referenced standardized tests [6]. Moreover, numerous discounting studies have suggested that this phenomenon generally improves – relative impulsivity improves – across the developmental lifespan (e.g., [4]). Examining discounting at an early age may be beneficial, as adults with high discounting scores often exhibit numerous undesirable behaviors such as compulsive gambling (e.g., [3]) and dangerous drug habits (e.g., [5]).

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Temporal Lobe Seizure

▶Psychomotor Seizures

Temporal Lobes

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Definition

The temporal lobes represent the lower lateral lobes of the cerebral cortex that play a vital role in auditory processing, receptive language, and memory.

Description

The temporal lobes represent the lower lateral lobes of the cerebral cortex that are bordered anteriorly and superiorly

by the sylvian fissure and posteriorly by the lower portion of the occipital lobe [4]. While the sylvian fissure provides a distinctive separation of the temporal lobes from the frontal and parietal lobes, such a clear separation is not seen between the temporal lobe and the occipital lobe. Rather an imaginary line that extends between the preoccipital notch and the transverse occipital sulcus known as the parieto-occipital sulcus separates these two areas [2]. Functionally the temporal lobes play a vital role in auditory processing, receptive language, and memory.

First, the temporal lobes' role in auditory processing is directly related to it housing the primary auditory cortex. This area is housed on what is referred to as Heschl's gyrus, which lies at the most superior portion of the lobe slightly inside the sylvian fissure [5]. It works in combination with the planum temporale, which lies posterior to Heschl's gyrus, also within the temporal lobe [5]. In comparison to one another Heschl's gyrus is believed to play a more prominent role in non-speech aspects of language and musical processing whereas the planum temporale is believed to play a greater role in actual speech comprehension [5].

In terms of the temporal lobes' role in receptive language, this is by way of it housing Wernicke's area, which lies just posterior to the primary auditory cortex [2]. Upon auditory stimuli being received and processed by the primary and secondary auditory centers, the information is transmitted posteriorly to Wernicke's area to assist in comprehension [3]. However, Wernicke's area can also play a role in reading and writing [3].

Finally, the temporal lobes play a vital role in memory. This is largely related to the functioning of the medial temporal lobes and the hippocampus [5], which are vital structures and regions in the consolidation of information into long-term memory. In this way the temporal lobes are important to new learning and memory. This is best exemplified by presentations that are related to impairment of new learning and memory, such as Alzheimer's disease. In this presentation the aforementioned areas of the temporal lobes represent the sites of primary affliction and thus the disease manifests largely as impairment in new learning and memory [1]. This is not to say that the temporal lobes represent the site of a memory center, rather, once information to be remembered is processed by the aforementioned structures/areas that information is sent back to various cortical areas for storage.

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Tension

▶Stress

Terminal Illness

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Synonyms

End-stage disease; Fatal illness

Definition

Terminal illness refers to an illness or disease process that is not responsive to curative medical treatment and which will worsen and eventually cause death.

Description

A person who suffers from a terminal illness is said to be terminally ill, and although it is difficult to predict exactly how long a terminally ill person will live it is often assumed that a terminal illness will result in death in 6 months or less. This timeframe is most applicable to illnesses with somewhat predicable trajectories, such as cancer. In contrast, some other common conditions such as Alzheimer's disease, organ system failure, lung disease, and AIDS, for example, may exhibit much less predictable disease trajectories and may not result in death for many months or even years. Consequently, the predictability of when an illness has reached the terminal stage can vary significantly [9].

Medical Treatments Utilized During the Course of Terminal Illness

In general, as the course of an illness progresses to the terminal stage, curative treatment options become increasingly limited. However, in search of remission or

cure, some terminally ill patients continue to pursue aggressive treatment regimens, such as chemotherapy, until the time of their death. Other terminally ill patients combine traditional western medicine with complementary treatments, and still others elect to forgo all traditional treatment approaches in favor of trying untested or alternative approaches to manage symptoms or achieve a cure [6, 14].

Regardless of which treatment approaches are utilized throughout the course of a patient's disease process, by the time an illness is terminal it is generally not responsive to curative medical interventions. When the chance of cure becomes remote and the negative side effects of aggressive treatment outweigh the benefits, some terminally ill patients discontinue curative treatment in favor of palliative care or hospice.

Palliative care is a medical specialty that aims to enhance the quality of life of patients and their families and to alleviate patient suffering associated with distressing disease symptoms or aversive side effects of medical treatments [16]. Although palliative care can be provided from the time a patient is initially diagnosed with a chronic or terminal illness, many do not receive palliative care until they are terminally ill and even then only a relatively small number of patients receive palliative care at any point during the course of their disease. The number of physicians who are trained in palliative medicine and the number of facilities which offer palliative care programs are limited. Additionally, patients are often unaware of the benefits of palliative care or only associate palliative care with hospice [8, 16].

Palliative care and hospice care share many commonalities, and in fact all hospice patients receive palliative care. However, it is hospice that is typically considered to be the gold-standard model for end-of-life care. The goal of hospice is to offer comfort, state-of-the-art pain control, symptom management, and sensitive care in an effort to reduce suffering and enhance the quality of life of terminally ill patients until their death. An interdisciplinary team of health care professionals provides daily, around-the-clock care and support throughout the course of the dying process, often at the patient's home. Like palliative care, hospice offers holistic medical care to meet the physical, social, psychological, and spiritual needs of the patient as well as the patient's family and bereavement support is also offered to families following the patient's death [3].

Regardless of which treatment approaches are pursued, dying patients and their families generally agree that preventing and managing pain and other distressing symptoms, ensuring continuity of care, supporting patient and family emotional and spiritual well-being, making informed decisions, and increasing survival time are priorities related to terminal care. Unfortunately, many families, patients, and medical professionals believe that with the exceptions of hospice and palliative care, these health care priorities for end-of-life care have yet to be satisfactorily addressed in the American health care system [8].

General Quality of Terminal Care in the United States

In 1997, the International Work Group in Death, Dying, and Bereavement published *Assumptions and Principles Underlying Standards for Terminal Care* [13]. At that time, the work group noted that medical patients routinely suffered from inept terminal care. More recently, in 2003, a report on end of life care titled: *Means to a Better End: A Report on Dying in America Today* was released by Last Acts, the nation's largest coalition advocating for improved end-of-life patient care [8]. The report graded all 50 states and the District of Columbia on the availability and use of eight key elements of end-of-life care. Unfortunately, most states earned grades of Cs or below on the eight terminal-care measures. It is not surprising then that the Institute of Medicine has identified end-of-life care as a priority for improving the quality of health care in the United States and health care providers such as Ira Byock, a nationally-recognized authority on terminal illness and hospice, has testified before Congress and argued that end-of-life care in the United States has reached a state of crisis. Finally, at the same time that Last Acts published their findings on the quality of each state's terminal care, they also released the results of a national survey showing that 93% of Americans, including those who have recently lost a loved one, are dissatisfied with end-of-life care and believe that terminal care needs to be improved.

Relevance to Childhood Development

The majority of terminal illnesses occur during adulthood. However, each year in the United States approximately 500,000 children struggle with life-limiting, serious illnesses and 30,000 pediatric deaths occur [7]. Of those 30,000 deaths the majority is accident related, but cancer accounts for 1,500 deaths and is the leading cause of disease-related death in children [1]. Caring for children with potentially fatal cancer or any other terminal illness poses unique personal and professional challenges and is quite different from caring for terminally ill adults [7]. At a very basic level the suffering and impending death of a child seems inherently unfair. It challenges an adult's

understanding of the natural order of death and triggers a profound sense of helplessness at being unable to protect the sick child.

As noted previously, the quality of care for terminally ill adults is poor and unfortunately it has been reported that terminally ill children also suffer needlessly and receive inadequate physical and psychosocial support [11]. Although hospice care would seem to best meet the multifaceted needs of terminally ill children and their families, many hospice programs lack significant experience in caring for terminally ill children. Additionally, receiving hospice care is contingent upon the cessation of all curative treatment efforts and choosing to discontinue any further life-extending treatments for a child can be an excruciating decision for both parents and physicians [1, 11].

In addition to bearing witness to the suffering of terminally ill children and struggling to find the best quality medical care for them, another challenging issue related to caring for those children is whether or not to openly share information regarding their condition and impending death. This issue has been studied and contested in the literature for over 50 years [5, 10, 12] and relates to the quality of psychosocial support offered during the course of pediatric terminal care.

The Dying Child's Understanding and Emotional Response to Their Death

Until the late 1960s, researchers reported that although terminally ill teenagers could understand their own mortality, terminally ill children under the age of ten did not possess the capacity to understand their fatal prognosis as evidenced by their lack of questions about their death. Consequently, information regarding their illness and prognosis was generally withheld from critically ill children in an effort to shield them from distress. In the early 1970s, however, several researchers discovered that terminally ill children could, in fact, express an awareness of their impending death even when no one had discussed their prognosis with them [12]. Several years later, in a seminal article, Maria Bluebond-Langner reported that fatally-ill children came to understand the seriousness of their illness through a series of five stages and fully understood the terminal nature of their illness [2]. Initially the children learned that they had a serious illness. They then proceeded to learn the names and side-effects of drugs used to treat their illness, followed by the purposes of medical procedures and treatments. As their disease progressed, they learned that they would experience a series of relapses and remissions and then ultimately understood that they would die as a result of their disease.

Since the publication of Bluebond-Langer's article and numerous corroborating reports which followed, it has become generally accepted that a child's personal experience with serious illness and medical treatment can accelerate an understanding of their prognosis such that even young children can understand the seriousness of their condition. Consequently, an essential component of providing psychosocial support for terminally ill children would seem to include encouraging open communication and answering questions in a developmentally appropriate manner [15].

In addition to providing needed information, allowing for and supporting open communication with dying children also provides essential emotional support. In spite of their ability to understand the seriousness of their health status, terminally ill children still lack emotional maturity and need the presence of caring adults to support them in their efforts to adapt to their circumstances. Unfortunately, parents and other close loved ones who would normally help the child cope with emotionally challenging situations are deeply, personally affected by the child's illness and impending death and may lack the ability to provide emotional support. Health care providers may also be unavailable to provide support because they sometimes emotionally withdraw from seriously ill children when they too are deeply affected by the child's condition [4].

Although providing end-of-life care for terminally ill children and adults is inherently challenging, it is essential that both groups receive high quality, holistic support that strives to meet their physical, emotional, social, and spiritual needs. The goal is to not simply add days, weeks, or months to a terminally ill person's life, but to add quality to their life.

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Termination

►Abortion

Test Anxiety

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Synonyms

Evaluation anxiety; Performance anxiety

Definition

Test anxiety refers to the subjective experience of intense physiological, cognitive, and/or behavioral symptoms of anxiety before or during test-taking situations that interferes with test performance.

Description

Test anxiety is a specific type of performance anxiety that occurs when a person is being evaluated formally or informally. Children most often experience test anxiety in response to taking exams, delivering presentations, and participating in class [1]. Fear of being negatively evaluated (e.g., "My teacher will think I'm stupid") is a common fear reported by children with test anxiety. Symptoms of test anxiety can be physiological (e.g., rapid heart rate, muscle tension, flushing of the skin, sleeping problems, headaches), cognitive (e.g., memory difficulties, attention problems, concentration problems, worry, problem-solving difficulties, cognitive distortions) and/or behavioral (e.g., task avoidance, withdrawal, rapid speech, fidgeting, failure to complete tasks) [2].

Test anxiety is a common occurrence that affects approximately 50% of school-aged students. It generally peaks during the elementary years and again in early adolescence, with an interim decline [1]. Symptoms related to test anxiety typically impair performance, and studies have demonstrated that children with test anxiety score significantly lower on academic achievement test when compared with other children. Children with test anxiety are also more likely to experience lower self-esteem, lower self-perceived social and cognitive competence, and more non-test anxiety. The comorbidity rate of test anxiety and generalized anxiety disorder, characterized by apprehension about many events on most days in the absence of conditions that would normally provoke such a reaction, is 50% [2].

Relevance to Childhood Development

Test anxiety is typically treated using behavioral and/or cognitive-behavioral methods. Behavioral interventions include relaxation training and systematic desensitization. In systematic desensitization, children are gradually exposed to items on a hierarchy of anxiety-provoking situations while relaxation is achieved at each step. Cognitive-behavioral strategies focus on changing irrational and/or faulty thinking patterns. For example, a child might be taught to replace their automatic thought of "I'm going to do terrible on this test" with "I am well prepared and will take one question at a time" [3].

Given the high prevalence of text anxiety among school-aged children, there has been a recent emphasis on preventative strategies. While the research on the use of these strategies for preventing test anxiety is still emerging, practices such as educating teachers about performance anxiety, altering assessment methods to make the evaluation process less threatening, and teaching students study and test-taking skills are all recommended as promising approaches [1].

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Test Observations

►Behavioral Observation

Test of Memory and Learning

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Synonyms

TOMAL-2

Definition

The Test of Memory and Learning – second edition (TOMAL-2) is an assessment of immediate verbal and nonverbal memory with a delay recall component for verbal memory.

Description

The TOMAL-2 was published in 2007 and is an individually administered assessment of memory and learning indicated for children and adults from ages 5 years 0 months through 59 years 11 months. For older adults who need a shorter battery, the assessment developers created a truncated battery to use for adults aged 55 years 0 months through 89 years 11 months [3].

Structure

Scores from the TOMAL-2 subtests provide four core index scores: Verbal Memory Index (VMI), Nonverbal Memory Index (NMI), Composite Memory Index (CMI) and Verbal Delayed Recall Index (VDRI). The indexes are derived from eight core subtests, separated into verbal and nonverbal categories. Tables 1 and 2 provide a comprehensive look at the subtests and which subtests are organized into each domain. These eight subtests will assess a wide range of memory functioning including: concrete and abstract memory functions, learning processes, and immediate and delayed recall [1].

Test of Memory and Learning. Table 1 Core and supplementary subtests of the TOMAL-2 which have a mean score of 10 and a standard deviation of 3

Core subtests	Supplementary subtests
Verbal	Verbal
Memory for stories	Letters forward
Word selective reminding	Letters backward
Object recall	Digits forward
Paired recall	Digits backward
Nonverbal	Nonverbal
Facial memory	Visual selective reminding
Abstract visual memory	Manual imitation
Visual sequential memory	
Memory for location	

Test of Memory and Learning. Table 2 Core and supplementary indexes for the TOMAL-2 which have a mean of 100 and a standard deviation of 15

Core indexes	Supplementary indexes
Verbal memory index (VMI)	Sequential recall index (SRI)
Nonverbal memory index (NMI)	Free recall index (FRI)
Composite memory index (CMI)	Associative recall index (ARI)
Verbal delayed recall index (VDRI)	Learning index (LI)
	Attention/concentration index (ACI)

The VMI assesses memory for information presented verbally and reproduced in a sequential manner. This task is especially important in diagnosing learning disabilities with primary deficits in speech and language issues in children and adults and assessing adults with occupations which rely heavily on verbal communication. This index is comprised of Memory for Stories, Word Selective Reminding, Object Recall and Paired Recall [1].

The NMI assesses memory for information that is presented nonverbally and reproduced nonverbally. This index taps into deficits in the right hemisphere, and is particularly useful in diagnosing learning disabilities with primary deficits in perceptual-motor or related nonverbal functions or in brain injured individuals with nonverbal deficits. This index is comprised of Facial Memory, Abstract Visual Memory, Visual Sequential Memory and Memory for Location [1].

The CMI assesses the overall combination of the patient's verbal and nonverbal memory by combining the scaled scores on the previous two measures. It is the most reliable measure of the patient's general memory abilities and should be interpreted first before looking at the other indexes. This index is most useful when compared to the VMI and NMI to assess for specific deficits compared to global deficits [1].

The VDRI assesses memory for information presented verbally for recall after a delayed period with distraction in between [1]. This area of memory is particularly important when assessing a patient for a traumatic brain injury, as delayed recall is typically more affected than immediate recall. Additionally, dementias or progressively deteriorating mental conditions, also are often impaired more on delayed versus immediate recall which can be crucial information in the differential diagnosis.

The goal of the TOMAL-2 is to give the examiner an idea of the memory and learning functioning of the patient. Within the subtests, the patient is asked to store and then reproduce stimuli after an intermittent time delay. On certain subtests the patient is also offered corrective feedback through reminding which allows the scoring and interpretation of learning or acquisition curves.

Learning Curves

Word Selective Reminding, Object Recall, Paired Recall and Visual Selective Reminding can be combined to calculate a learning curve across the trials. Within these subtests the examiner reminds the patient of items that were performed incorrectly and there is a high repetition component built in with these subtests. This index allows the examiner to compare learning to memory in order to shed light on differentiation between memory and other factors which could impair daily functioning [1].

Standardization

Reynolds and Voress standardized the TOMAL-2 using 1,921 individuals from a population-proportionate stratified random sampling of the United States and drawn to mimic the 2002 US Bureau of Census statistics on the basis of geographic region, race, family income, educational attainment and exceptionality status. These individuals' scores were used to derive the standard scores and norms found in the test manual. For further information on the standardization sample, see Reynolds and Voress [3].

Relevance to Childhood Development

The TOMAL-2 as an assessment to quantify deficits in memory and learning has a wide array of applications for the clinician. Primarily the test is used for diagnosing learning disabilities, traumatic brain injuries, attention deficit/hyperactivity disorder (ADHD), affective disorders and dementia and neurological/neurodevelopmental disorders [1–3]. For the pediatric population it is particularly useful in psychoeducational evaluations to diagnose learning disabilities or exceptionalities for the purpose of proper recommendations and providing appropriate accommodations [2].

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Test Theory

▶Psychometrics

Testes

▶Gonads

Testicles

▶Gonads

Testimonials

▶Personal Narratives

Testing

▶Assessment

Testing the Limits

▶Dynamic Assessment

Thalamus

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Definition

The thalamus is one structure of the diencephalon that serves as the primary relay station for sensory information, while also sharing connections with the limbic system, cerebellum, and basal ganglia as well as a number of other systems.

Description

The thalamus represents one structure of the diencephalon, which is an aspect of the forebrain. Functionally, the thalamus is most often conceptualized as the main sensory and motor relay station in the brain [3]. The thalamus exerts its influence along these lines by way of its projections to and/or from the spinal cord and cranial nerves, visual and auditory sensory receptors, and the cerebellum and basal ganglia [1, 3, 4]. However, in addition to its role in relaying sensory and motor information the thalamus also presents with projections to the limbic system as well as a number of other areas of the cerebral cortex [6].

While the thalamus, as a whole, is linked with a number of systems, structures, and functions, many of the nuclei included as part of this entity present with topographical projections that are function or system specialized [5]. The thalamus is the summation of a number of nuclei that fall into one of three functional categories: relay, intralaminar, or reticular. These categories correspond with the general role the nucleus plays. Relay nuclei are so termed as they receive incoming information from various pathways and then pass this information on to relevant areas/systems throughout the cortex [2]. The vast majority of thalamic nuclei are relay nuclei. These include the ventral posterior lateral nucleus (relays somatosensory spinal inputs to the cortex), ventral posteromedial nucleus (relays somatosensory cranial nerve inputs and taste to the cortex), lateral geniculate nucleus (relays visual inputs to the cortex), medial geniculate nucleus (relays auditory inputs to the cortex), ventral lateral nucleus, ventral anterior nucleus, and lateral dorsal nucleus (all relay basal ganglian and cerebellar inputs to the cortex), pulvinar nucleus and the lateral posterior nucleus (relays signals concerning behavioral orientation toward visual and other stimuli), ventral medial nucleus (relays signals concerning alertness and consciousness relays), mediodorsal nucleus (relay to and from the limbic system and frontal lobes), and the anterior nucleus and midline thalamic nuclei (relay to and from the limbic system) [2]. In comparison to the relay nuclei, the intralaminar nuclei are similar functionally in that they receive and then project information; however, they are differentiated in that they are housed within the internal medullary lamina and their projections primarily involve transmission to and from the basal ganglia as well as aspects of the brainstem, in lieu of projecting to the cortex like the relay nuclei do [2]. The intralaminar nuclei include the central medial nucleus, paracentral nucleus, central lateral nucleus, centromedian nucleus and parafascicular nucleus [2]. Finally, the reticular nucleus stands alone and is distinguished from the other nuclei in that it does not project to the cortex nor to the basal ganglia and/or brainstem, but instead only receives input from the cortex as well as the multitude of other thalamic nuclei that it projects back to the thalamus [2].

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Theine

▶Caffeine

Thematic Apperception Test

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Synonyms

TAT

Definition

A performance based, projective story-telling technique consisting of 31 cards that portray people in differing situations, nature scenes and 1 blank card. Subjects are

asked to make up a story about each of 20 cards chosen for administration based on gender and other variables, and are encouraged to elaborate through queries about what characters are thinking, what led up to and follows the story described, how it might end, is there a moral to the story, and so on. Subjects are encouraged to use their imagination in responding. Content and structural aspects of each story are analyzed to identify personality characteristics and emotional states of mind.

Description

The TAT, developed by Murray [4], was the result of his early studying individual differences in the measurement of personality variables. The term "apperception" reflects the test's focus on subjects' interpretation of what they see in the cards, and the meaning they attach to these perceptions [6]. Murray developed the concept of "needs" or motivational influences, together with "presses" or environmental factors working in concert to determine personality and presented case studies showing the use of the TAT to uncover these individual characteristics. He is considered the primary proponent of the *idiographic* method of personality assessment.

The TAT is one of the more widely used projective personality measures with dozens of formal scoring systems [3] but it has critics who voice concerns about poor reliability and validity, difficulty with use in certain populations, a lack of standardization, and outdated and "dark" stimulus cards [6]. These criticisms have spawned similar, alternative apperception tests including the Children's Apperception Test and the Senior Apperception Test [1], The Roberts Apperception Test for Children (Roberts-2; [5]) and the Tell-Me-A-Story-Test (TEMAS; [2]).

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Theory of Mind

►Mindblindness

Theory of Mind Task

►False Belief Task

Therapists

►Counselors
►Psychotherapist

Therapy

►Dynamic Psychotherapy

Thinking

►Cognitive Skills
►Critical Thinking

Thinking Outside of the Box

►Creativity

Thinking Styles

►Cognitive Styles

Thinking Symbolically

►Symbolic Thought

Thioridazine

►Mellaril®

Thomas and Chess Classification of Infant

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Synonyms

Behavioral style; Temperament

Definition

A system for classifying a constellation of behavioral characteristics that is present at birth and relatively stable over childhood and adolescence.

Description

In the late 1950s, the child psychiatrists Alexander Thomas (1914–2003) and Stella Chess (1914–2007) launched a 30-year longitudinal study, known as the New York Longitudinal Study of Child Temperament (NYLS). The impetus for the study was the clinicians' increasing disenchantment with the prevailing, at that time, environmental views of children's behavioral problems as a consequence of unfit, poor parenting. In their clinical practice, they observed numerous instances of children raised in caring families, who nevertheless displayed some sort of psychopathology, as well as cases of lack of behavioral problems in the context of dysfunctional parenting. It became clear that the existing theories regarding parenting as the only source of influence provided unsatisfactory and insufficient explanations for such inconsistencies.

One of the major goals of the study was to explore the origin, nature and dynamics of behavioral disorders in children. The longitudinal project evolved into a study of children's temperament, defined as a behavioral style explaining the *way* in which an individual behaves. Unlike ability and motivation, which refer to the *what*, *how well* and *why* of behavior, temperament, according to the authors, represents the *how* of behavior [3].

The initial sample, gathered over the course of 6 years, consisted of 141 children coming from 87 families, the majority of whom were Jewish (78%) and of middle and upper-middle class backgrounds. The data collection occurred in several stages: when the children were 2–3 months old, every 3 months before the infants turned 18 months, every 6 months until 5 years of age, at 7, 8, 16, 18, and 22 years of age, and finally when the subjects were in their middle and late twenties [1].

In infancy, the primary source of information was parental report of children's behavior. Data were gathered through open-ended interview questions, in which the parents were asked to provide detailed descriptions of their offspring's routine daily activities, reactions to ordinary and unusual events, special incidences, and trauma. To guard against possible parental biases in reporting, data were gathered systematically and objectively through detailed interview protocols. Parents were encouraged to describe their children's behavior in precise terms, provide specific details and refrain from subjective interpretations of their children's psychological states and motives [3]. As children grew older, additional data were gathered through teacher interviews, direct observations in the school setting by trained research personnel, examination of school records, psychometric testing, and parent and youth interviews [1].

Following the initial wave of data collection, 22 parent interviews were analyzed by the means of inductive content analysis through which nine broad dimensions of children's temperament emerged. The nine broad temperamental categories were later found to be relatively stable throughout childhood and present in children from Puerto Rican descent. These categories included: (1) *Activity Level* (i.e., the child's motor activity and the diurnal proportion of active and inactive periods); (2) *Rhythmicity/Regularity* (i.e., the extent to which bodily functions such as sleeping, feeding and elimination patterns follow a predictable vs. unpredictable schedule); (3) *Approach or Withdrawal* (i.e., the nature of the child's initial response to a novel stimulus such as a new person, event, toys, and situation. Approach is manifested in behaviors such as smiling, positive vocalization, actively reaching for the new object; whereas withdrawal is demonstrated through negative states and behaviors such as crying, fussing, grimacing, moving away, and rejecting the object); (4) *Adaptability* (i.e., the ease with which the child adjusts to changes and transitions); (5) *Threshold of Responsiveness* (i.e., the intensity of stimulation necessary to evoke a positive or negative response to sensory stimulus, objects and social contacts); (6) *Intensity of Reaction* (i.e., the energy level of the response, regardless of its duration and whether it is positive or negative in nature); (7) *Quality of Mood* (i.e., the amount of positive and negative affect and behavior); (8) *Distractibility* (i.e., the extent to which a child could be diverted from an ongoing activity or behavior through an extraneous stimulation); (9) *Attention Span and Persistence* (i.e., the duration of a particular activity pursued by the child as well as the child's inclination to continue his/her engagement in an activity when faced with obstacles and distractions).

Qualitative analysis and subsequent factor analysis of the dimensions of nine temperamental categories resulted in the

delineation of three significant temperamental constellations. Although the majority of the children in the NYLS sample were categorized using the established three temperamental constellations, the behavioral styles of approximately 35% of the children were unaccounted by the suggested classification. The researchers established substantial variability within each of the three types of temperaments.

- The first temperamental constellation was labeled "*The Easy Child*"; it was characterized by rhythmicity (regularity), positive approach, adaptability, and a predominantly positive quality of mood. The easy children, comprising approximately 40% of the NYLS sample, tend to develop quickly predictable schedules and routines, have moderate levels of motor activity, approach rather than withdraw from new experiences, adapt to new situations easily, and experience positive emotions.
- The second behavioral style was termed "*Difficult child*" and was found to be present in 10% of the NYLS sample. The constellation was characterized by irregularity in bodily functions, withdrawal from new stimuli, lack of or slow adaptability to change, and negative affectivity. The difficult child tends to establish irregular sleeping and eating patterns, be irritable, require more time to adjust to new people, situations and routines, cry frequently, have tantrums, and have inability to be soothed.
- The third temperamental constellation, evident in about 15% of the original sample, was labeled "*Slow-to-warm-up*"; it included a combination of low activity level, mild negative responses, moderate negative affectivity, slow adjustment to change, and withdrawal from new situations. These infants were shy and likely to withdraw from unfamiliar stimuli, however with repeated exposure, they tended to adapt successfully to change and transitions.

In addition, Thomas and Chess emphasized the interaction between children's temperamental profile and the environment. Temperament is that special characteristic that might predispose a child to a behavioral problem, regardless of the demands of the environment and the stress present in it. The child's individual behavioral style could not only affect the manner in which he/she responds to specific events and child-rearing practices, but it can also elicit particular favorable or unfavorable parental attitudes and behaviors. To recognize the bidirectional nature of influences, Thomas and Chess coined the term "goodness of fit," which refers to the consonance between the child's individual temperament and the demands and expectations of the environment. They maintained that there should be a good fit between a child's temperament and his/her environment in order for optimal healthy development to occur. In contrast, observed deviations from the course of normal development, manifested in a variety of indices of maladjustment, could be attributed to a poor fit or dissonance between a child's initial biological predispositions and excessive stress and environmental demands [2, 3].

The Thomas and Chess classification of children had a profound influence on subsequent conceptualizations of temperament and led to proliferation of research on the role of individual predispositions. In addition, several intervention models based on their work have emerged and have been successfully utilized both in clinical practice and work with parents [2].

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Thorazine®

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Synonyms

Chlorpromazine; Major tranquilizer; Neuroleptic

Definition

Thorazine® is a typical antipsychotic medication, brand name for chlorpromazine. This medication is FDA approved for the treatment of schizophrenia in patients above the age of 18 as well as for children over the age of 1 for treatment of disruptive and aggressive behavior disorders.

Description

Thorazine® is a dopamine receptor antagonist. It was the first medication introduced for the treatment of hallucinations and delusions. Although it is one of the oldest antipsychotics, Thorazine® is not as commonly used as other antipsychotics. It is considered low potency, meaning that a higher dosage of Thorazine® is needed in order for it to

have the same effect as a high potency antipsychotic such as Haldol®, Prolixin®, or Navane®. Because a higher dosage of Thorazine® is necessary, this agent is more sedating than high potency antipsychotic medications.

Thorazine® is available in tablets (10, 25, 50, 100, and 200), capsules (30, 75, 150, 200, and 300 mg), liquid solution (10 mg/5 mL, 30 mg/mL, 100 mg/mL), intramuscular injections (25 mg/mL), and rectal suppositories (25 mg and 100 mg).

Relevance to Childhood Development

Thorazine® may be used for the treatment of aggressiveness, impulse control, extreme irritability, hostility, and agitation. However, use of antipsychotic agents to control children's disruptive behavior has been described as controversial. It is recommended that if antipsychotics are used with children, the high-potency and less sedating antipsychotic agents are utilized instead of the more sedating low-potency drugs.

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Thorndike, Edward Lee

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Life Dates

1874–1949

Educational Information

Edward Lee Thorndike was born in Williamsburg, Massachusetts. He was raised in a strict environment and his early years were characterized by frequent moves due to his father's work as a Methodist minister. Throughout his school career Thorndike excelled academically and in 1891 selected the Methodist church supported Wesleyan University in Connecticut for his undergraduate education. During his junior year at Wesleyan, Thorndike became interested in the emerging field of psychology and began reading works by William James. He graduated from Wesleyan in 1895 with Phi Beta Kappa Honors and the ambition of becoming a secondary English teacher. Following his graduation from Wesleyan, Thorndike enrolled at Harvard University. While at Harvard he enrolled in psychology courses taught by William James. After completion of these courses, Thorndike decided to pursue a career in psychology. Also during his time at Harvard he developed an interest in animal intelligence and began a series of experiments on learning in chickens. In 1897 he left Harvard for personal reasons and enrolled at Columbia University [1].

At Columbia Thorndike was given permission to continue the animal learning experiments he began at Harvard. He began working with cats in puzzle boxes in order to test his theories regarding learning in animals. These experiments led to Thorndike's formulation of the Law of Effect. Thorndike earned his Ph.D. degree from Columbia in 1898 with the dissertation *Animal Intelligence: An Experimental Study of the Associative Processes in Animals.*

Accomplishments

The Law of Effect, developed while Thorndike was a doctoral student at Columbia, was formalized in 1905. This theory had far reaching implications for the fields of psychology and education. The Law of Effect examines the relationship between a stimulus and an organism's response to the stimulus. Responses that are paired with satisfaction or reinforcement increase the likelihood of the response reoccurring, whereas responses that are paired with dissatisfaction or discomfort decrease the likelihood of the response occurring.

Thorndike contributed heavily to the field of education during his 43 year tenure as a professor at Columbia Teacher's College. He desired to make teaching a science and published numerous books and articles on how to improve the quality of teaching in schools. Notable publications include: *Educational Psychology* (1903), *Introduction to the Theory of Mental and Social Measurements* (1904), *Principles of Teaching* (1906), *The Teacher's Word Book* (1921), *The Measurement of Intelligence* (1927), and the *Fundamentals of Learning* (1927) [2]. Many of Thorndike's books were widely read and his suggestions helped inform practice in classroom settings in the United

States and abroad. Two of the most prominent examples were the *Thorndike Arithmetics* which was adopted as the state textbook for California and Indiana with over a half million copies sold in the first year of publication, and the *Thorndike – Century Junior and Senior Dictionaries* which were also widely published and distributed [2].

In addition to his numerous publications, Thorndike was also involved in the construction of psychological assessments. He constructed the CAVD Examination in 1925 which measured four components of intelligence: sentence completion, arithmetic, vocabulary, and following directions. The CAVD test was used to assess the ability of students at Columbia and other universities. Another test developed by Thorndike to measure reasoning in the area of reading was the Thorndike-McCall Reading Tests developed in 1921.

Thorndike maintained a lifelong interest in assessment and was a founding member of the Psychological Corporation. Thorndike was elected as President of the American Psychological Association in 1912. In a 1921 poll conducted by American Men of Science, Thorndike was the top-ranked psychologist in the United States. Additionally, he served as president of the American Association for the Advancement of Science in 1933.

Contributions

Thorndike had a significant impact on two generations of professionals in the field of education. Throughout his life he was a prolific writer of both articles and books. Additionally, his Law of Effect was influential in the study of behavior, notably how rewards and punishment impact learning. Among his other contributions, Thorndike served on a committee of nine psychologists who were appointed to study how psychology could benefit the war effort during World War I.

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Thought Disorder

►Psychosis

Thoughtful Attendance to Oneself

►Self-care Development

Thoughts

►Cognitive Skills

Threat

►Risk

Threat Response

►Anxiety

Thrombophilia

►Thrombophilic Disorders

Thrombophilic Disorders

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Synonyms

Clotting disorders; Hypercoagulability; Thrombophilia

Definition

Thrombophilic Disorder is a broad term for disorders and conditions in which the blood forms clots easily or excessively, also known as thrombophilia. These disorders may result in an increased risk of blood clot formation in the veins and arteries, which can contribute to complications resulting in severe injury or death. Thrombophilic disorders can be due to either hereditary or acquired factors.

Description

Blood clotting is a natural and normal process in which the blood cells and proteins group together to form a clump, or clot, to slow or inhibit bleeding after a blood vessel has been injured. Most blood clots tend to dissolve naturally through cellular activity. Some people, however,

may experience thrombophilia, where blood clots form without the presence of injury at increased rates. These blood clots can travel through the blood stream to other locations, resulting in a thrombosis, or a blood clot that obstructs the flow of blood through the circulatory system. The resulting blockage is referred to as a venous thromboembolism. A venous thromboembolism can have serious, even fatal, implications. These blood clots can block the circulation of blood to the heart or brain, resulting in a heart attack or stroke, respectively. Clots may also obstruct the blood flow to the extremities, which left untreated, could result in tissue death (necrosis) or infection (gangrene). These clots may also lodge within the veins of the lungs, leading to potentially fatal condition known as a pulmonary embolism. Thrombophilic disorders are characterized by the increased risk of thrombosis formation, and are often diagnosed after a thrombosis or thromboembolism event has occurred.

Symptoms

The thrombophilic disorder does not usually present with its own symptoms, and is primarily only discovered after an abnormal clotting event has occurred. A thrombosis formed within the veins of the upper and lower extremities (legs, and more rarely, arms), also known as deep vein thrombosis (DVT), may cause swelling, redness, and discomfort of the area. Left untreated, the DVT can cause tissue damage or tissue death. These clots are most often diagnosed with ultrasound or other imaging tests, and are generally treated with blood-thinning drugs [2]. DVT may also occur within veins of major organ systems, such as the liver, kidney, and abdomen, and can form within the placenta or umbilical cord during pregnancy.

Causes

Thrombophilic disorders may be due to congenital/hereditary factors and/or acquired conditions. Heritable causes of thrombophilia include genetic mutations of the genes encoding the natural anticoagulants and clotting factors of the body. Acquired conditions such as Lupus, some cancers, limited mobility, and previous vein or arterial damage can promote thrombosis formation. Pregnancy, tobacco usage, prolonged periods of immobility, long periods of airplane travel, and oral contraceptives can also greatly increase the occurrence of a thrombosis, especially when paired with a preexisting heritable condition [1].

Management and Treatment

Some patients with a present thrombophilic state or increased risk for thrombophilia may require behavioral or medical intervention. Some behavioral changes, such as increased mobilization (especially during long air flights or prolonged periods of sitting), increased hydration, cessation of tobacco usage, and the use of compression stockings or mechanical compression devices during periods of immobility and injury, may be helpful. Women with an increased risk for thrombophilic disorders may be advised to limit or stop oral contraceptives and/or hormone treatment, and use blood thinners during pregnancy [1]. Some doctors may also advise daily doses of Aspirin or other blood thinners as a method of prophylaxis in some patients diagnosed with thrombophilia but with no previous thromboembolic event.

Patients who have had a thrombotic episode may be treated with a combination of blood thinners and anticoagulants. Oral anticoagulation may need to be continued on a long term basis if the thrombophilic state persists. This decision should be discussed and monitored in conjunction with input from local hematology specialists [3].

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Throw Up

▶Purging

Tics

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Synonyms

Habit; Spasm; Tourette's disorder; Twitch

Definition

A tic is a sudden and repetitive movement or vocalization.

Description

Motor tics are characterized by rapid and involuntary repetitive or jerking movements, while vocal tics are characterized by sounds or words that are repetitive and serve no function [1]. Tics can range from simple (e.g., head jerking or throat clearing) to complex (e.g., words or more complex movements). Many individuals with tics report having a "premonitory urge," or unpleasant sensation prior to ticcing that is relieved after the tic is performed. When individuals have both motor and vocal tics for at least one year, they are often diagnosed with Tourette's disorder. In the general population, the estimated prevalence of Tourette's Disorder and other tic disorders ranges from 1 to 4.8% [2], with boys being four times more likely than girls to have a tic disorder [3]. Tourette's disorder occurs in diverse racial and ethnic groups. Factors contributing to tics and tic disorders are largely considered to be biological, although behavioral factors are sometimes thought to maintain the presence of tics. Vulnerability to Tourette's disorder appears to be genetic. Tics and Tourette's disorder are first diagnosed in childhood, with age of tic onset as young as two and usually developing during childhood or early adolescence [1]. Although some people with tics have them throughout life, many experience a reduction in symptoms in late adolescence or early adulthood. Individuals with tic disorders experience impairment in a variety of domains, and the current treatment of choice for tics is pharmacotherapy (Riddle & Carson, 2001; Kurlan, 1997), although recent research has shown that behavioral therapy may also be helpful.

Relevance to Childhood Development

Tics and tic disorders are considered a diagnosis that is first made in childhood [1]. As such, they are associated with social, familial, and academic impairment in the lives of children during critical periods of learning and development. Physically, tics can result in pain, discomfort, cuts, burns, and bruises. Psychosocially children with tic disorders report disruptions in family functioning, high levels of family conflict, and occupational difficulties as they reach adulthood. They also report having low self-esteem, while their peers describe them as less socially acceptable than other children without tics. In addition to impairment caused directly by tics, having tics is associated with high comorbidity of other psychological disorders, such as attention deficit hyperactivity disorder (ADHD), obsessive-compulsive disorder (OCD), trichotillomania, and other anxiety and depressive disorders. Those disorders are also associated with impairment across multiple domains. Currently, treatment options for children with tic disorders are limited due to lack of efficacious and safe pharmacological treatment options. While behavioral treatments such as habit reversal training (HRT) demonstrate promise, few rigorous studies have been completed and those treatments have yet to be disseminated to community providers.

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Time-Delay Discounting

▶Temporal Discounting

Timeouts

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Synonyms

Behavior management; Negative reinforcement; Parent training; Punishment

Definition

A timeout (TO) is a behavior management procedure through which a person is separated from access to positive reinforcement following the display of inappropriate behavior, therefore, making reinforcement unavailable for some length of time.

Description

As a child behavior-management procedure, TOs have been effectively employed with children of varied functioning levels (e.g., developmentally delayed, normal intelligence) and ages (e.g., preschoolers, adolescents), in a wide variety of settings (e.g., schools, homes, inpatient settings), for the treatment of a range of externalizing problem behaviors (e.g., noncompliance, tantrumming, aggression, self-injurious behavior; [6]). Although used

extensively by parents, teachers, and others responsible for child behavior management over the past four decades, TO should not be conceptualized as a singular intervention to be employed in the same manner for all forms of child misbehavior. Rather, appropriate TO usage involves considerations of the differing forms of TO as well as the varied effects on child behavior that the technique may produce. In addition, the numerous procedural variables involved in TO implementation (i.e., the actual steps of TO usage) represent a series of options that users of the intervention may select.

Types of TO. Regarding differing TO types, Harris [7] outlined five forms arranged along a continuum of restrictiveness specific to the degree of change to a less reinforcing environment. Essentially, the varied forms of TO involve consideration of the magnitude of difference between the amount of reinforcement available to the child in the natural environment (called the time-in [TI] environment) versus the amount of reinforcement available while in TO. In order for TO to be effective, the child must perceive a noticeable difference between the positive consequences available to them in the TI environment and the lack of such positive consequences while in TO [12, 14]. It is in this way that each TO type moves along the continuum from those forms most closely resembling the reinforcement opportunities available in the TI environment to those forms conceptualized as far more restrictive.

Nonexclusion TO, the least restrictive TO type, involves removing the child from direct access to reinforcement, while permitting them to remain in the same general space to observe others [7]. For example, a child placed in TO for hitting their brother would be moved away from their brother, but remain in the same room so as to observe their brother's continued appropriate behavior and reinforcement. In addition to classification as a broad category, three specific subtypes of nonexclusion TO labeled ignoring, removal of reinforcing stimulus conditions, and contingent observation also exist [3]. Although all may not immediately seem synonymous with TO, each fits coherently with the previous definition. Ignoring simply involves turning away from the child so as to deny them access to attention for a period of time (i.e., access to adult attention is widely viewed as a primary motivating factor for child behavior). Removal of reinforcing stimulus conditions is the actual removal of some tangible object from the child's space (e.g., taking away a preferred toy for a period of time). Finally, contingent observation requires the child to observe the ongoing behavior of others, although they are not allowed to directly participate in the ongoing activity (e.g., the broad nonexclusion example outlined previously represents contingent observation TO).

Progressing along the continuum of restrictiveness are the other two broad forms of TO, labeled exclusion and isolation TO [7]. Exclusion TO also involves the removal of the child from access to reinforcement (as in nonexclusion forms), but also prohibits observation of ongoing activities, thereby, increasing the restrictiveness. Common means through which exclusion TOs are effected include facing a child to a corner or placing the child behind some visual impediment (e.g., a screen). Isolation TO, the most restrictive all of TO forms, involves complete child removal from the TI environment. Generally speaking, such procedures involve removing the child from the space in which the misbehavior occurred and placing them in a different room until TO completion. Although clear in terms of differing reinforcement contingencies between the TI and TO environments, a decision to use isolation TO should not be made hastily. Rather, issues of child safety and missed opportunities with respect to ongoing activities in the TI environment (e.g., classroom instructional time) should be given the utmost consideration. As such, some have proposed that the use of isolation TO should include a predetermined length of time for the removal, adequate supervision throughout alternative room placement, and protection of the rights of the removed child [1, 9].

Behavioral effects of TO. Regarding the differing effects that TO may have on childhood behavior, diverging possibilities exist, one commonly considered (and simple to understand) and one commonly overlooked (and more difficult to understand). First, TO is most often viewed as a behavior reduction procedure and, therefore, a punishment intervention employed to decrease the frequency of problematic behavior [12]. This relationship is simple to understand, in that TOs applied as a consequence for bad behavior lead to less such bad behavior in the future. For example, placing a child in TO for hitting their brother (as previously outlined) leads to less hitting in the future. Conversely, TO may also function to increase the behavior that it follows and, therefore, may be classified as a negative reinforcement procedure [5, 13]. Such behavioral relationships occur when placement in TO allows the child to escape completion of some aversive task or event. For example, sending a child to TO for failure to complete a math assignment may actually make the child less likely to complete math work in the future because by placing them in TO they are able to escape (i.e., get out of) math work completion. Given such divergent behavioral consequences, TO is commonly recommended as a consequence for

behaviors maintained by positive reinforcement and advised against with behaviors maintained by negative reinforcement. Although this proscription makes intuitive sense, recent research (i.e., [5]) has begun to shed new light on the possibilities of using TO with escape-type behaviors. Through the inclusion of specific TO implementation variables, the procedure may yet demonstrate applicability with such behaviors.

TO implementation variables. Procedurally, a number of TO variables are available for parents, teachers, and other adults to select from when employing a TO intervention. Although a multitude of implementation options do exist, there continues to be no agreed upon standard TO protocol. Rather, differing researchers and practitioners use different combinations of procedural variables when using TO. As such, the following presents a brief summary of some of the most common TO implementation variables.

Two initial variables to be considered are verbalized reasons and verbalized warnings. Although closely related in that both involve verbal statements from the adult to the child prior to TO placement, each is a separate variable in that the foci of the verbalizations are distinct. Specifically, verbalized reasons are stated explanations prior to TO indicating why it was initiated and verbalized warnings are statements that specify TO as the consequence for continued misbehavior. To contrast further, consider the following examples using the previously introduced illustration involving a child sent to TO for hitting their brother: (a) reason – "You hit your brother, TO." (b) warning – "If you hit your brother again you will go to TO." As can be seen from these statements obvious implementation differences exist between the use of verbalized reasons and warnings. Although little empirical study has been conducted on the individual effectiveness of either reasons or warnings, basic understanding of behavioral principles seems to indicate that if verbal interactions are to precede TO placement, they should be kept as short as possible so as to not reinforce inappropriate child behavior via access to adult verbal attention [14]. In addition, specific to the use of warnings, such verbal interaction may actually prolong the duration of inappropriate behavior as the warning essentially allows for one more occurrence of bad behavior before the adult takes corrective action.

Following the use or exclusion of verbal procedures as introduced, determinations regarding both the duration and location of TO should be made. Meaning simply the length of time a child must remain in TO prior to release, many variations of TO duration have appeared in the literature. Ranging from as short as a few seconds to several hours or more [15], TO duration is one of the most frequently reported implementation parameters across TO investigations. Although often directly outlined by researchers, individual investigations regarding the relative effectiveness of one duration versus another are scarce. Some have indicated that shorter TO durations (e.g., 1 min) are effective although longer durations (e.g., 4 min) may produce greater behavioral changes [8], although such conclusions are far from definitive. A more well established conclusion is that of a sequencing effect indicating that shorter durations are as effective as longer durations only if the shorter one precedes the longer [7]. Regarding TO location, implementation decisions often relate to the type of TO to be employed, as in those options outlined by Harris. Specifically, the choice of a nonexclusion, exclusion, or isolation TO procedure brings with it known location criteria. For example, the use of a nonexclusion TO dictates that the child remain in the natural environment, so that environment would be the TO location.

Similar to the ways in which both verbalized reasons and verbalized warnings are related yet distinct, two other TO implementation variables share similar relational aspects. More specifically, although TO escape contingencies and release procedures both involve children leaving TO, definitive procedural differences exist. Escape contingencies are methods used following a child's leaving TO prior to dismissal in an attempt to prevent such behavior from occurring again, while release procedures are the ways in which children are actually dismissed from TO by the overseeing adult. Common TO escape contingencies include (a) repeated returns – repeatedly guiding the child back to TO, (b) spanking – hitting the child on buttocks with an open hand, (c) holding – physically restraining the child in TO, and (d) barrier – use of a physical impediment to block TO escape [14]. Although past research indicates treatment efficacy of both spanking and barrier procedures [10, 11], research of repeated return procedures (which may be less aversive to children) has yet to be conducted. Regarding TO release procedures, determinations usually involve one of the following options: (a) time-based – dismissal occurs following passage of a given time duration, (b) behavior-based – dismissal occurs when specific behavioral contingencies are met (e.g., sitting quietly without protesting TO placement) absent any time requirement, (c) contingent delay – dismissal occurs when both time and behavioral requirements are met with TO extended for inappropriate behavior, and (d) child release – child makes individual determination regarding cessation of TO. Although empirical support for contingent delay release is the strongest [2, 4], results again are far from conclusive.

In sum, TO has been and continues to be an effective intervention for the treatment of a wide variety of childhood problem behaviors across multiple developmental levels, ages, and settings. Although often conceptualized as a simple procedure to be used in the same manner for all children, effective TOs require a deeper understanding of distinctive TO types, differing effects on child behavior, and interrelated implementation variables. Although briefly introduced, the previous discussion does not outline all implementation variables that influence TO effectiveness. Other variables include distinctions such as whether children are verbally instructed versus physically placed in TO, the use of some signaling device to indicate that TO has commenced, and the use of a debriefing procedure following TO dismissal among several others [15].

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Time-Series Design

▶Single Subject Research Design

Timidity

▶Shy Children

Timings

▶Standard Celeration Charting

Titchener, Edward Bradford

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Life Dates

1867–1927

Educational Information

Titchener studied at Oxford University, and then earned his doctorate in psychology under Wilhelm Wundt (1832–1920) at Leipzig.

Accomplishments

Titchener spent his entire academic career at Cornell University, where he developed what was then the United States' largest doctoral program in psychology. He was the primary proponent of a theory he named Structuralism. Titchener's Structuralism attempted to distinguish, isolate, and

This work represents the scholarship of the author and does not imply any official position of the New York City Department of Education.

catalogue mental elements such as sensations, images, and affections through the use of a trained method of reporting called introspection. As such, while Titchener was aware of and personally supported research in such areas as child, animal, social, and abnormal psychology, he did not regard such areas as the proper domain for experimental psychology. As is common with his mentor Wundt and many other German psychologists of the era, there were strong overtones of psychophysical methodology and concerns within Titchener's conceptualization of experimental psychology.

Titchener was an early member of the American Psychological Association and founded his own society, called the Experimentalists, in 1904. He published multiple research articles and mentored 56 doctoral students, and wrote a four-volume series of books entitled *Experimental Psychology* between 1901 and 1905. These books, informally referred to as "Titchener's Manuals," were written for both the psychology student and instructor, and their meticulous detail combined with an approachable writing style to provide a wider audience with a taste of the rigor Titchener's students experienced in his laboratory [4, 5].

Among Titchener's more illustrious students were Margaret Floy Washburn (1871–1939) who would be elected president of the American Psychological Association in 1921, and Edwin Boring (1886-1968) who would author the well-known text *A History of Experimental Psychology* in 1950 [1].

Contribution

While Titchener was not the only Wundtian student with a successful and influential career in the United States, he is usually portrayed as a Wundt loyalist and Structuralism is described as being nearly identical to the Wundtian system of psychology. A portion of this reputation is due to Titchener's authoritative translations of several of Wundt's major works, and another part undoubtedly stems from the manner in which Titchener's former student Boring wrote about his mentor. Boring's strong personal bond with his mentor, as described by Samelson [4], led him not only to dedicate his *A History of Experimental Psychology* to Titchener, but to place Titchener's Structuralism within the same chapters on German psychology rather than within later chapters on American psychology. In a crucial re-evaluation of Titchener's philosophy and methodology, Leahey [3] successfully argued that there are huge differences between Wundt's and Titchener's systems and that Structuralism was best described as a type of descriptive, correlational psychology. Regardless, recent research indicates that the misconception of Titchener as a sort of "mirror image" of Wundt still persists in textbooks to the present [7].

Titchener's true legacy lies neither with Structuralism nor in the misrepresentation of him as a Wundt loyalist but in his strong commitment to psychology as an experimental, rather than an applied, science. Titchener's scientific conservatism, which Leahey [3] found analogous to Skinner's radical behaviorism, provided a strong positivistic counterpoint to the applied direction of American psychology during World War I. Titchener's stress on the importance of rigorously testing consciousness theory using respected methodology within the laboratory also stood in contrast to early classical conditioning, which he regarded as a technology due to its perceived atheoretical focus. Thus, Titchener deserves credit for not only helping to establish the laboratory's primacy in psychological research but also for promoting the role of empirically-based theory-testing as the goal of psychological science, and reiterating the importance of consciousness within psychology.

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To Participate in Regular Activity Associated with Independent Living

►Activities of Daily Living

Toe or Big-Toe Phenomenon or Sign

►Babinsky Response

Token Economies

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Synonyms

Conditioned reinforcement; Motivational system; Secondary reinforcement

Definition

Token economies are based on learning principles derived from operant psychology, specifically secondary positive reinforcement, and have the objective of increasing and supporting desirable child behaviors.

Description

A token is any inanimate object such as a coin, mark on a piece of paper, ticket, or sticker. By themselves, tokens do not have intrinsic value. However, when paired (conditioned) with pleasurable consequences, tokens acquire reinforcing properties. For example, parents might give their 10-year-old son poker chips each time he completes assigned household chores. By allowing the child to exchange his earned poker chips for favorite objects and activities (e.g., watching television, purchasing a toy), the poker chips will function as positive reinforcement. Positive reinforcement is defined as a consequence following behavior which increases the future probability of that behavior.

Token economies are established first by selecting one or more "target" behaviors. These behaviors represent desirable and adaptive skills that benefit children and their quality of life. Next, the type of token and method of delivery must be selected. Grades or ratings on a report card, for example, are token stimuli experienced by virtually every school-age child.

Subsequent steps in designing token economies include choosing so called "back up" reinforcers and deciding how a child can acquire them through token exchange. Using the previously cited report card illustration, parents could have their child earn a special night out when she/he receives a certain number of "good" and "excellent" grades. The grades in this depiction are the tokens and the special night out is the "back up" reinforcer.

The effectiveness of token economies depends on the correct pairing of tokens with "back up" reinforcers and consistently presenting tokens when "target" behaviors are demonstrated. The essential procedures comprising token economies can be varied further, for example, by adding additional "target" behaviors, requiring more tokens to be accumulated before exchanging them, and changing token value. Much like our real-world economy, these manipulations can enhance motivation within an incentive-focused system.

Token economies have several advantages for improving child behavior. First, tokens bridge the gap between responding and pleasurable consequences that are provided at a later time. Second, virtually any behavior can be reinforced with tokens. Third, a token economy can be implemented in multiple settings, be they school, home, or the community. And fourth, tokens allow for the selection of idiosyncratic child preferences and delayed activities (e.g., going to the movies, having a party) as positive reinforcement.

Relevance to Childhood Development

The importance of behavior consequences in child development has long been recognized. Learning is facilitated when children experience positive effects from their behavior. As infants, the behavior-consequence contingency is dominated by adult bonding and the fulfillment of basic needs. Typical child development is then characterized by learning that is supported by social consequences such as praise, approval, and recognition. As behavior becomes more sophisticated, it is less dependent on immediate and tangible consequences but instead, is maintained by delayed and secondary sources of pleasure, often mediated "symbolically" in a manner consistent with token economies.

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TOMAL-2

►Test of Memory and Learning

Tormenters

►Bullies

Torrance Tests

►Creativity Assessment

Tot

►Infancy

Touch

►Tactile Stimulation

Tourette Syndrome

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Synonyms

Gilles de la Tourette's syndrome; Tourette's disorder

Definition

Tourette Syndrome (TS) is classified as a Tic Disorder in the *Diagnostic and Statistical Manual of Mental Disorders* [1]. TS includes four diagnostic criteria: (a) the presence of both multiple motor tics and at least one vocal tic; (b) occurrence of tics on a frequent and consistent basis for more than 1 year; (c) onset before 18 years of age; and (d) tics are not accounted for by substance use or a general medical condition such as Huntington's disease or multiple sclerosis [1].

Description

The *DSM-IV-TR* defines a "tic" as "a sudden, rapid, recurrent, nonrhythmic, stereotyped motor movement or vocalization" [1]. Motor tics include eye blinking, nose twitching, neck jerking, touching, smelling, head shaking, jumping, grooming behaviors, copropraxia (i.e., making obscene gestures), and echopraxia (i.e., imitating gestures used by others). Vocal tics include grunting, barking, sniffing, throat clearing, echolalia (i.e., repeating sounds or words used by others), and coprolalia (i.e., uttering obscene words) [1, 3]. Although coprolalia tics receive much attention in the popular media, these behaviors are relatively rare, occurring in less than 10% of people diagnosed with TS [1]. The diagnosis of TS requires the presence of multiple motor tics in addition to at least one vocal tic, frequent and consistent occurrence of tics for more than 1 year, onset before 18 years of age, and lack of other explanations for the tics (e.g., substance use, other medical conditions).

The prevalence of TS is estimated at approximately 5–30 children per 10,000 [1], although other estimates are closer to 1% of children and adolescents [8] and epidemiologic studies have presented widely varying prevalence estimates [11]. TS is diagnosed between three and five times more frequently in males than in females in clinical settings, but only about two times more frequently in males in some community samples [1]. Research suggests that TS has been found across all countries, cultures, and ethnic groups [10].

The mean age at onset of TS is between 6 and 9 years, and diagnosis usually occurs by early adolescence [1, 8]. Severity of tics can range from very mild to very severe, resulting in varying levels of distress and social stigmatization [1]. The course of TS is quite variable, but tics are typically the worst between 8 and 12 years of age, followed by a gradual decline in tic severity into young adulthood [12]. Thus, some symptoms may last into adulthood, but short- and long-term periods of remission may occur, and the severity and frequency of symptoms usually decrease in adolescence and adulthood [1]. It is estimated that about 20% of children with TS experience at least a moderate level of impairment by young adulthood, and those who continue to experience TS symptoms as adults are more likely to experience more severe symptoms such as self-injurious tics and coprolalia [5, 12]. Tics may get worse when the child is under stress or during times of excitement or fatigue, and may become less severe or frequent when the child is expending their energy concentrating on physical or mental tasks [3].

Children diagnosed with TS often demonstrate additional behavioral symptoms such as obsessions, compulsions, inattention, hyperactivity, and impulsivity, and many may experience embarrassment, depression, and peer rejection due to their tics [1]. TS also has been associated with deficits in multiple areas of neuropsychological

functioning, including intelligence, language, perceptual-motor skills, memory and learning, academic achievement, and executive function, although research with many of these areas has produced inconsistent findings [9]. Common comorbid diagnoses include Attention Deficit Hyperactivity Disorder (ADHD), Obsessive-Compulsive Disorder (OCD), and Learning Disabilities (LD) [1, 8], in addition to anxiety disorders, mood disorders, sleep disturbances, self-injurious behaviors, difficulty controlling temper, and oppositional-defiant disorder [3, 10]. ADHD co-occurs in greater than 50% of children with TS in many clinical and epidemiological studies, OCD co-occurs in about 35–50% of children with TS, and LD co-occurs in about 10–25% of children with TS; at the same time, most children who are diagnosed with ADHD, OCD, or LD do not meet criteria for TS [9].

The combination of TS and comorbid diagnoses is often associated with more severe behavioral and psychological impairment than TS alone, and research suggests that many difficulties are accounted for by comorbid conditions rather than related to TS alone [3, 10]. Thus, it appears that the likelihood of significant impairment increases as does the number of comorbid conditions or symptoms. Further, the neuropsychological, emotional-behavioral, and family functioning profile may be quite different when TS is combined with other diagnoses, which will have implications for prognosis and treatment [9].

With regard to etiology, TS is considered a genetic neurodevelopmental disorder due to strong evidence for genetic influences [1, 2]. The specific genes that contribute to TS are under investigation and numerous models for inheritance have been proposed, but the genetics of TS are not yet fully understood [10, 12], although available research suggests that TS is caused by multiple genes rather than by a single predictable gene. From a neurological perspective, TS is believed to be related to abnormal neurotransmitter activity causing disinhibition of cortico-striatal-thalamic-cortical circuitry, or circuits that link regions of the frontal lobes with subcortical structures [3]. Decreased motor inhibition due to impaired modulation of neuronal activity in the basal ganglia and thalamus has been implicated, which likely involves the circuit from the prefrontal cortex to the caudate, then to the globus pallidus and substantia nigra, then to the thalamus, and finally back to the cortex [7]. Numerous abnormalities in neural functional connectivity and specific structures have been observed among children and adolescents with TS (see [9], for a review). Specific neurotransmitter systems identified as potential causal factors in TS include dopamine, serotonin, acetylcholine, GABA amino acids, and others [10]. Environmental influences related to TS and tic severity include prenatal and perinatal insults such as maternal stress during pregnancy, maternal use of stimulant medications and smoking during pregnancy, low birth weight, and birth complications, but a lack of controlled studies prevents definitive conclusions about these variables [4, 10]. Environmental factors may interact with genetic and neurobiological factors to determine whether children with the genetic predisposition for TS will actually develop the disorder.

Evidence-based interventions for TS include pharmacological and psychosocial approaches. Currently there is greater empirical support for pharmacological approaches (e.g., typical and atypical antipsychotics, alpha-adrenergic agents, selective serotonin reuptake inhibitors) as these appear to be the most commonly used interventions for TS, although evidence is starting to accumulate for psychosocial interventions such as habit reversal training and response prevention [9]. Children with TS undergoing stimulant medication treatment for comorbid ADHD should be closely monitored for worsening tics, as stimulant medications may exacerbate tics among some children with TS [10].

Relevance to Childhood Development

Children with TS are likely to receive special education services under the Other Health Impaired category of IDEA, although they may be classified into other categories (e.g., Emotional Disturbance, Learning Disability) depending on the unique nature of their symptom presentation, comorbidity, and specific emotional, behavioral, and academic difficulties. Common academic consequences of tics include interference with reading and handwriting due to motor tics, and avoidance of reading aloud and asking questions in class due to interfering vocal tics and related embarrassment [6]. As a result, many students with TS (especially those with comorbid conditions) receive classroom accommodations or instructional modifications to address their behavioral and academic needs.

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Tourette's Disorder

►Tics
►Tourette Syndrome

Tower

►Tower Tasks

Tower of Colorado

►Tower Tasks

Tower of Hanoi

►Tower Tasks

Tower of London

►Tower Tasks

Tower of London-Drexel

►Tower Tasks

Tower Tasks

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Synonyms

Stockings of Cambridge; Tower; Tower of Colorado; Tower of Hanoi; Tower of London; Tower of London-Drexel

Definition

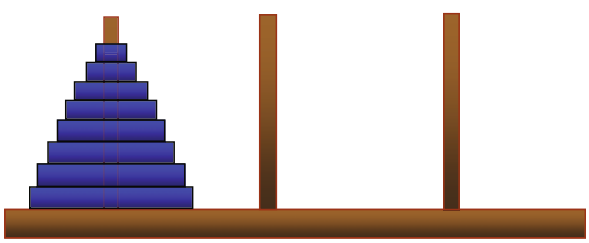
The tower tasks are puzzles most commonly used to measure planning ability. They require the individual to solve a specified problem using the least number of moves to arrive at the solution.

Description

There are multiple versions of the tower tasks [10]. The over riding feature of each is the requirement that the individual solve a problem by moving the pieces and arriving at goal position in the least number of moves. Tower tasks are most commonly used to measure planning ability. Planning refers to the ability to look ahead through a series of possible steps, some of which may be counter-intuitive, to reach a desired goal. The ability to plan is an essential part of daily living, and difficulties with this skill may impact on an individual's autonomy.

Tower of Hanoi

The Tower of Hanoi (TOH) was invented by Edouard Lucas, a French mathematician. Originally the task consisted of eight disks of increasing size that were stacked on one of three pegs (see below in Fig. 1). The goal of the



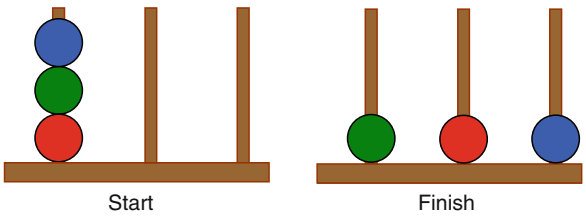
Tower Tasks. Fig. 1 An eight disk Tower of Hanoi task.

task was to move all the disks from the left peg to the right one following rules: (1) move only one disk at a time, (2) never place a larger disk on top of a smaller disk. The problem required a recursive shuffling of the disks until the problem is solved in the minimum number of moves.

Various adaptation of the TOH have been devised, one of the more recent ones appears in the Delis-Kaplan Executive Function System (D-KEFS). In this version the tower test consists of five disks which vary in size from large to small. For each of the nine problems, the participant is presented with a visual example of the tower to be built and two to five disks on the board in a predetermined starting position, depending on the level of difficulty of the tower [5]. They are then required to make the disks on the board match the ones presented in pictorial form. The rules remained the same as in the original TOH: participants were asked to plan their moves prior to starting while observing two rules, never place a larger disk on top of a smaller disk and only move one disk at a time.

Tower of London

The Tower of London was first devised by Shallice [14] to assess problem solving skills associated in patients with frontal lobe deficits [14]. Shallice suggested that although the TOH met some of the pre-requisites required for planning the task was difficult to use experimentally because of difficulties grading the levels of complexity for the different problems. Therefore, he adapted the TOH to a task that he named the Tower of London (TOL) task. In the original TOL task there are two configurations of three balls placed on three pegs (see Fig. 2). One configuration is the start point and the other the finish point. The rules for this task were that only one ball could be moved at a time. Once again the object of the task was to solve the problem in the least number of moves. Different start and finish points could increase or decrease the level of complexity of the problem. Shallice's original TOL used 12 problems of increasing difficulty. Individuals were instructed to plan all their moves prior to beginning. The problems required the formulation and execution of a series of sub-goals to complete.



Tower Tasks. Fig. 2 Tower of London task.

As with the TOH various versions of the TOL have been devised. Most of these variations manipulate the difficulty of the task by increasing the number of balls and pegs as in the Tower of Toronto task or the five disk TOL task suggested by Ward and Allport [2, 3, 15]. However, a unique variation of the TOL task was devised by the Cambridge group and is called the Stockings of Cambridge, which is computerized. In this task the participants are shown two displays of three colored balls, one in the top half of the screen and the other in the bottom half of the screen [13]. The balls are held in pockets or stockings, suspended from a line. Each pocket is a different size, one could hold only one ball, another a maximum of two balls and the third held a maximum of three balls. The participant is required to rearrange the balls in the bottom half of the screen to match the arrangement of the colored balls in the top half of the screen. A touch sensitive screen enabled the balls to be moved by the participant who selected the desired ball by touching the image of the ball on the screen and then touching an empty pocket space where they wanted to place the ball.

One difficulty with the popularization of the tower tasks is that the different variations of the TOL and TOH have been used interchangeably with patient groups, despite the fact that there is currently no evidence regarding their relative sensitivity. Another area of difficulty relates to the complexity of different tower problems. In the literature little attention has been paid to the selection of problem sets. However, recent research has placed particular importance on the selection of tower problems as it has been suggested that different aspects of individual problems may increase or decrease the level of task complexity [7, 12]. For example, subtle aspects of the TOL task may impact performance. These aspects include:

1. Sub-goals required
2. Search depth
3. Sub optimal alternatives
4. Counter intuitive moves
5. Start position
6. Goal position
7. Nested problems

At the most basic level, the number of moves can be considered an indicator of problem difficulty. However, two problems may have the same number of moves but differ with respect to the number of alternative moves available. This was outlined in the recent work by Berg and Byrd [10] in their description of the "problem space" associated with the TOL task.

The problem space defined by Berg and Byrd [10] is the graphic representation of the moves possible under the

rules of the task in which there are six permutations. As pointed out in the work of Berg and Byrd [10], for each permutation there are six possible ball positions. Each of the permutations are the same in that they have an identical six possible ball positions, but differ in the arrangements of the ball colors [1]. There are 210 spatially unique problems for each permutation in the type of TOL task ranging from 1 to 8 moves problems, giving a total of 1,260 possible unique problem sets (see [1] for a complete discussion regarding the problem space). It is easy to see that the difficulty of a particular problem may be influenced by more than just the number of moves required for its solution. For example, problems with the same number of moves may have a different "search depth" or sub-goal pattern. A sub-goal refers to moves that are essential to the solution of a given problem, but do not place a ball into its goal position [16]. The search depth is defined as the number of sub-goal moves before the first ball can be moved into a goal space. A longer search depth is considered to increase the difficulty of the problem as it requires more moves to be held in mind prior to being able to place the first ball in its goal position. Not only may a problem vary according to the number of paths available for achieving an optimal solution, but there may also be "sub-optimal alternatives." Sub-optimal alternatives refer to problems with one or more paths which take more than the minimum number of moves, but allow the first ball to be placed into its goal position within a number of moves equal to the optimal solution.

Further, the presence and number of "counter-intuitive moves" increases complexity. Counter-intuitive moves are moves that do not lead directly to the end goal and in some cases may require a ball to first be removed from its goal state in order to perform the optimal solution. Start position and finish positions may affect the individuals' performance. For example, in the flat start position, where there is one ball on each peg, there is no obvious first move. In contrast, a tower start position where all three balls on the tallest peg, the ordering of moves to obtain the finish position is more obvious [1]. Further, the latter has only two possible start moves while the former has four [1]. Moreover, a flat finish position provides an unclear final sequence, whereas a tower end gives a clear ordering for the sequence of final moves.

The importance of the finish position or "goal hierarchy" has been discussed in some depth by Kaller et al. [8]. These authors suggest that a tower end position can be considered "unambiguous" in relation to the final moves required, whereas a flat goal position can be considered "totally ambiguous." A goal position in between these two extremes may be considered "partially ambiguous." Finally, problems may be "nested," referring to the situation where the optimal path for the first problem is contained entirely in the second. The second problem differs only with regard to the additional moves at the start or finish.

Relevance to Childhood Development

The ability to perform frontal tasks such as the TOL and TOH systematically develops with age [11]. For example, younger children, 4–5 year olds, perform worse than 7–8 year olds who perform worse than adults [11]. Further, older adults (80s) perform worse than younger adults (20s) [4]. This age related ability to perform on the tower tasks is thought to reflect the development of the frontal lobes [6]. Because the ability to perform planning tasks such as the TOL and the TOH systematically develops in normally functioning children, they are able to be used in clinical contexts with children who have difficulties, including developmental delays or medical conditions and brain injury [8]. For example, children with closed head injury are likely to have more difficulty solving problems. Studies on children with traumatic brain injury indicate that severity of injury and age at testing are strongly correlated with performance on tower tasks [9].

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Tracking

►Ability Grouping

Traditions

►Culture

Trail Making Test

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Synonyms

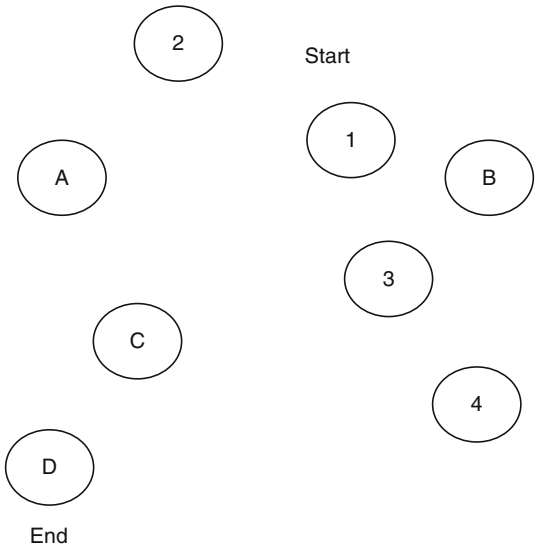
Complex trail making test; Trails

Definition

The trail making test is a neuropsychological test that assesses motor speed, speed of mental processing and mental flexibility. This test is considered to be highly vulnerable to the effects of brain injury.

Description

The original trail making test was a paper a pencil test with two parts. In part A the individual was asked to draw lines between 25 consecutively numbered circles spread randomly across a sheet of paper. Part B (sample shown below) is more difficult, the participant is asked to draw lines alternating between numbers and letters in sequence. For example, 1 → A → 2 → B, etc. They are asked to complete the task as quickly as possible without lifting the pencil from the paper. The test takes a maximum of 5–10 min to complete. The time taken to complete the task is recorded and this is used to assess the individual's performance. Norms are available to interpret the scores [6]. Performance is affected by age with older individuals taking longer to complete the task [1].



Interpretation

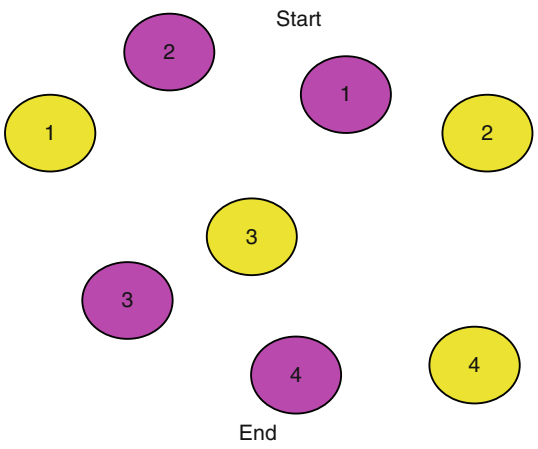
The Trail Making Test, particularly Trails B, is a good predictor of brain impairment and is useful for identifying frontal lobe damage [3, 4]. However, care must be taken in interpretation of the scores. For example, while slow performance on either part A and/or part B may suggest brain damage it could also be caused by motor slowing, lack of coordination, visual scanning difficulties and poor motivation. Other difficulties associated with this test are that it is inconsistent at differentiating individuals with brain injury from individuals with other psychiatric difficulties such as depression. So while this test has clinical utility for the identification of neuropsychological difficulties it is not a diagnostic tool.

The Trail Making Test has been included in the Delis Kaplan Executive Function System (D-KEFS) using an extended form which has five parts (visual scanning,

number sequencing, letter sequencing, number-letter switching and motor speed) [2]. This expanded form allows for a much more comprehensive assessment of performance and overcomes a number of the difficulties in the original Trail Making Test by enabling different aspects of performance to be assessed separately.

Relevance to Childhood Development

The Trail Making Test was originally designed for use with adults. However, it has been updated to include a child version. This test is only useful for children between 9 and 14 years of age. In response to the need for non culturally biased testing a Color Trails has also been developed for use with children [7] and has been successfully used with children 5 years and older. In this version Part A requires the child to correctly sequence numbers from 1 to 15. All odd numbers are embedded in circles that have pink background while all even numbers are embedded in a yellow background.



Part 2 contains numbers 1–15 in yellow and a duplicate set of numbers 1–15 in pink. For this part the child must again connect the circles in ascending order but this time must alternate between pink and yellow e.g., Pink 1, Yellow 2, Pink 3, Yellow 4, etc. [7] (see sample above).

Despite efforts to ensure that the test is culturally sensitive recent research indicates that both the Trails Test and The Children's Color Trails Test are influenced by language background and intelligence [5]. Therefore, some caution should be exercised when using the test with groups for whom English is not their first language.

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Trails

►Trail Making Test

Tranquilizers

►Anxiolytics/Hypnotics
►Depressants

Transcortical Motor Aphasia

►Childhood Aphasia

Transcortical Sensory Aphasia

►Childhood Aphasia

Transgender

►Gender Identity
►Homosexuality

Transgenderism

►Gender Identity Disorder

Transient Situational Disturbance

►Adjustment Disorder in Children

Transitional Bilingual Education

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Definition

An educational approach in the United States for students with limited English proficiency in which the students are instructed in their primary language for a limited time until they have reached sufficient proficiency in English and are then transitioned to English-only instruction.

Description

Transitional bilingual education programs are referred to as *early-exit* programs if students receive bilingual instruction (i.e., at least some instruction in primary language in addition to instruction in English) for 2 years or less and *late-exit* if students receive bilingual instruction for most or all of their elementary school years (typically around 40% of instruction in primary language until sixth grade) [1]. Language proficiency and academic achievement in English is the central long-term goal of such programs. Longitudinal research has demonstrated that late-exit bilingual education programs are associated with faster growth rates in academic achievement and similar growth rates in English language proficiency as compared to early-exit transitional bilingual education [2].

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Transmitter Substances

►Neurotransmitters

Transsexual

►Gender Identity

Transsexualism

►Gender Identity Disorder

Traumatic Brain Injury

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Synonyms

Brain disorders; Brain injury; Closed head injury; Closed head trauma; Head injury; Head trauma; Open head injury; Open head trauma; TBI

Definition

A traumatic brain injury (TBI) is an acquired injury to the brain caused by an external force to the head. The term "TBI" is *not* applied to individuals who have developmental brain disorders, such as attention deficit disorder, a cognitive disability, or a learning disability, nor is it the result of a tumor, infection, stroke, or loss of oxygen to the brain. A TBI may be classified as mild, moderate, or severe.

Description

Epidemiology, Morbidity and Mortality

According to the Centers for Disease Control (CDC), approximately 475,000 children ages birth to 14 years sustain a TBI in the United States each year. These brain injuries in children account for 37,000 hospitalizations and 435,000 emergency department visits annually, as well as approximately 2,700 deaths [8]. In fact, TBI is a leading cause of death among youth and represents a major public health concern [11]. As many as half of the deaths resulting from trauma are associated with brain injuries [7]. Virtually all of those who survive a TBI encounter adverse outcomes, which may range from a persistent vegetative state, severe disability, moderate disability, and minimal neurobehavioral impairment.

Classification of TBI

Traumatic brain injuries are classified by their level of severity. The most commonly used measure of injury severity is the Glasgow Coma Scale (GCS [9]), which can be used to assess individuals age four and over. An individual's best response in the following domains is recorded: eye opening, motor response, and verbal response. An adaptation of the GCS is shown below.

Eye opening	*Score*
Open spontaneously	4
Open to verbal command	3
Open to pain	2
No response	1
Best motor response	*Score*
Obeys verbal command	6
Localizes pain in response to painful stimulus	5
Flexion-withdrawal in response to painful stimulus	4
Abnormal flexion in response to painful stimulus	3
Extension in response to painful stimulus	2
No response	1
Best verbal response	*Score*
Oriented and converses	5
Disoriented and converses	4
Inappropriate words	3
Incomprehensible sounds	2
No response	1
Glasgow coma scale total	*3–15*

The Children's Coma Scale (CCS [5]) is a modified form of the Glasgow Coma Scale, and is recommended to assess the severity of TBI in children ages three years and younger. The CCS assesses functioning in the same three domains as those in the Glasgow Coma Scale, for a total score ranging from 3–15. A summary of the Children's Coma Scale is shown below.

Eye opening	*Score*
Spontaneous	4
Reaction to speech	3
Reaction to pain	2
No response	1
Best motor response	*Score*
Spontaneous (obeys verbal command)	6
Localizes in response to painful stimulus	5
Withdraws in response to painful stimulus	4
Abnormal flexion in response to painful stimulus	3
Abnormal extension in response to painful stimulus	2
No response	1
Best verbal response	*Score*
Smiles, oriented to sound, follows objects, interacts	5
Crying is consolable; interaction is inappropriate	4
Crying is inconsistently consolable; moaning may be present	3
Inconsolable; irritable and restless	2
No response	1
Children's coma scale total	*3–15*

A head injury is considered mild if the individual receives a GCS or CCS score between 13 and 15. Scores between 9 and 12 usually represent moderate injuries, and scores of 8 or less are indicative of severe injuries. The vast majority (85%) of traumatic brain injuries that require medical treatment are mild; 8–10% are moderate, while 6–13% are severe [11].

In addition to the depth of coma (i.e., GCS or CCS score), injury severity may also be determined by characteristics such as the duration of impaired consciousness (i.e., time period during which the child does not follow motor commands) and the length of post traumatic amnesia (PTA; i.e., time during which the child is not fully oriented and does not display intact memory for daily events) [11]. A mild traumatic brain injury may be indicated by a brief or no loss of consciousness and PTA lasting less than 24 hours. If a child is in a coma for less than 24 hours and demonstrates PTA for 1–7 days, the TBI is usually considered moderate. Severe TBI is suggested by a coma lasting more than 24 hours and PTA lasting more than 7 days.

Causes of Injury

Causes of brain injury vary significantly with age. The leading cause of TBI in infants and young children is falls, which account for about 39% of all child traumatic brain injuries [8]. Older children are more likely to sustain a TBI as a result of sports and recreational accidents and pedestrian or bicycle collisions with motor vehicles. Motor vehicle accidents cause the majority of brain injuries in the adolescent population [7].

Types of Head Injuries

A TBI is often referred to as either an "open head injury" or a "closed head injury." In an open head injury, the skull and brain are penetrated by an external object, such as a bullet from a gun. In a closed head injury, the skull and brain are not penetrated; a closed head injury may result from a fall or car accident.

The pathophysiology of a brain injury occurs at the time of impact, but continues over a period of time, possibly as long as weeks or months. The various injuries that result from a TBI may be classified as primary injuries or secondary injuries. Primary injuries are observable injuries resulting from the trauma itself. These may include skull fractures (in an open head injury), intracranial contusions and hemorrhage (i.e., bleeding within the brain), and/or mechanical injuries from nerve fibers and blood vessels. Secondary injuries result indirectly from the trauma. Brain swelling, hypoxia, hypotension, and increased intracranial pressure are all examples of secondary injuries. Secondary injuries may also include a multitude of neurochemical events. One common chain of neurochemical events includes the production of free radicals and excitatory amino acids along with the disruption of normal calcium homeostasis. These events act to exacerbate the hypoxic-ischemic insult that is a common secondary injury. Finally, secondary injuries include a variety of late effects. One is posttraumatic seizures. Approximately 3–9% of children with head injuries experience these seizures, with most of these children experiencing their first seizure within 2 years following their head trauma. Posttraumatic seizures appear to occur more commonly in younger children as well as those who sustained a penetrating injury or depressed skull fracture. Other possible but less common late effects of head injury include white matter degeneration, cerebral atrophy, enlarged ventricles, and hydrocephalus [11].

Neurobehavioral Consequences

A TBI may result in a variety of neurobehavioral consequences, depending on the specific location of the trauma in the brain, and the type (i.e., closed versus open head injury, primary versus secondary injuries) and severity of the injury. While no specific, all-inclusive list of symptoms and sequelae can be generated to describe the outcomes of every pediatric TBI, there are areas where impairments frequently occur. These domains include intellectual/cognitive, speech/language (including memory), academic, sensorimotor, and behavioral or emotional functioning [2, 4].

Intellectual and Cognitive Functioning. Impaired performance on intelligence tests is frequently seen after a child has sustained a TBI, particularly on nonverbal measures, such as the Perceptual Reasoning and Processing Speed indices on the Wechsler Intelligence Scale for Children, Fourth Edition (WISC-IV). It is thought that individuals with TBI have more trouble with fluid problem-solving skills and speeded motor output, while they may do better with previously acquired knowledge. Though a child's IQ scores may significantly improve in the one to two years following a TBI, scores often remain depressed relative to pre-injury levels. This is particularly true among children with severe head injuries [11].

Memory difficulties are another common and persistent consequence of a TBI [3]. Additionally, complaints regarding attention problems very often follow childhood head injuries [11]. Finally, executive functions, such as concept formation, integrating, organizing and generalizing information, problem solving, and judgment, also tend to be negatively impacted by pediatric TBI [2].

Functional limitations associated with these commonly occurring cognitive impairments often include poor initiation of tasks and poor task orientation [3]. Unfortunately, significant cognitive weaknesses can be overlooked following TBI, as children may appear intact due to the relatively rapid recovery of mobility, self-care skills, and basic language functioning [4].

Speech and Language Functioning. Children with TBI often display pronounced difficulties with the pragmatic aspects of language [11]. Deficits have been demonstrated in a variety of skills, such as language comprehension, abstraction, making inferences, organization of verbal or written material, expression of complex ideas, and word fluency [4]. It has been suggested that receptive language improves at the same rate as cognitive and perceptual functioning. Studies further show that expressive language (speech) correlates with improvements in motor function [3].

Academic Performance. Given the cognitive deficits described above, it is not surprising that pediatric TBI is often associated with reported declines in academic functioning. Deficits in basic cognitive processes resulting from brain injury almost always cause impairment in academic performance. In some cases, this impairment may not be apparent for a year or more following the injury. As a result, when the deficits are identified, they may not be attributed to the injury. Even if correctly attributed to the TBI, however, improvements in academic achievement are often slow [2].

Research has shown that a child's premorbid academic ability is a strong predictor of reading and spelling achievement two years following a brain injury. It is suggested that the higher a child's ability prior to an injury, the higher his or her reading and spelling achievement is likely to be at 2 years post-injury. Interestingly, research does not indicate a similar effect for mathematics achievement [1].

Sensorimotor Functioning. In terms of sensory functions, some studies have shown that up to 25% of children with severe injuries display deficits on tests of stereognosis (i.e., the ability to perceive the form of an

object by using sense of touch), finger localization, and graphesthesia (i.e., the ability to recognize writing on the skin only using sense of touch) [11]. Some children report hemianopsia (i.e., blindness to one side of the visual field), diplopia (i.e., double vision), blurred vision, and even cortical blindness (i.e., loss of the ability to interpret visual information). Hearing loss occurs in approximately 35% of TBI patients. Inner ear problems are reported as much as 6 months following the injury in 50% of children with TBI. Lastly, nearly all children require extra time to process sensory information following a severe brain injury [4].

Up to 33% of children with TBI evidence some motor control sequelae, and children with these impairments may show improvement for up to 7 years post-injury [3]. Motor problems may include impairments in gait and coordination, complex psychomotor tasks, and fine motor skills [2, 11]. Children with TBI may perform better on motor tasks when speed is not a requirement. Many children regain motor abilities faster than in any other domain of functioning. Unfortunately, adults may unknowingly interpret the regaining of these abilities as a total recovery on the child's part, since the child now looks and acts "normal."

Behavioral Functioning and Emotional Disturbances. Of all the aspects of adaptive behavior, social problems with peers and family members tend to be the most unrelenting [4]. Families tend to rate behavioral disturbances and personality change as the most troublesome and persistent problem following pediatric TBI. Problems in social behavior are often associated with impaired executive functioning and prefrontal brain injury. Common behavioral sequelae from brain injury include increased aggression, poor anger control, and hyperactivity [2].

Adaptive deficits and behavioral disturbances can be related to severity of injury as well as the child's premorbid functioning [11]. Interestingly, behavioral functioning following pediatric TBI does not appear to be correlated with cognitive outcomes; thus cognitive and behavioral outcomes may be somewhat independent following the injury, and their determinants may vary significantly. Research suggests that cognitive outcomes may be related more strongly to injury-related variables, while behavioral outcomes appear to be related more strongly to measures of preinjury family functioning [12].

After a brain injury, a child might also experience depression for a variety of reasons. The child may realize, for example, that he or she has a disability and is different from classmates or peers. Additionally, the child may have enough insight to understand that he or she is no longer performing at his or her preinjury level. The child may even mourn the loss of the person he or she once was prior to the injury. It is important to note that symptoms of childhood depression often differ from those demonstrated in adulthood. Whereas depressed adults often appear sad and withdrawn, children may appear irritable and easily agitated. Thus, irritability, agitation, and anger could be a result of the brain injury itself, or could be the child's psychological reaction to the injury's effect on his or her life.

Prediction of Outcomes

Several factors appear to contribute to the outcome of a child's TBI. The severity of the injury is one of these factors, though it must be noted that there is a wide variation in outcomes even in individuals in one particular range of severity. In addition to injury severity, a child's preinjury characteristics (i.e., age, developmental level, academic achievement), family functioning, and behavioral adjustment interact with the brain injury itself to determine the child's initial presentation and long-term outcome [1, 6].

Though the clinical picture of TBI can differ from one injury or individual to another, children who survive brain injuries generally demonstrate a rather predictable sequence of recovery, moving from coma to a period of agitation and disorientation, then to more purposeful and age-appropriate behaviors. It is the duration of time in which this sequence of recovery occurs that differs according to injury severity, the child's preinjury characteristics, and his or her environment. The most rapid recovery generally takes place in the first 6–12 months after the injury, though continued gradual improvements can be observed for several years following the TBI [4].

It is a common misconception that the earlier a child sustains a head injury, the more likely he or she will be to recover, because the brain is malleable and can compensate for the deficits. In reality, however, the sequelae of the injury will often be worse the younger the child is at the time of injury. Unlike adults with TBI, children are in the midst of rapid developmental changes in all domains of functioning, including physical, cognitive, and behavioral [4]. Since developmental milestones must synchronically be met before proper development can occur, a child's neurological impairments resulting from a TBI can hinder future learning and cognitive development [10]. Recent studies suggest that children demonstrate less damage than adults early in recovery, but deficits often emerge later as the child matures [3].

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Trichotillomania

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Synonyms

Chronic hair pulling; Hair pulling

Definition

Trichotillomania is a psychological disorder that involves the pulling out of one's own hair that leads to physical damage and/or difficulties in social, occupational, or other types of functioning. In many, but not all, cases the hair pulling is preceded by a feeling of tension or arousal that is reduced or negated by the pulling. The pulling may occur from many sites but the scalp is the most common pulling area. The pulling is commonly done with one's fingers but devices such as tweezers are also used. Finally, the pulled hair is often manipulated, and in a small percentage of people it is ingested.

Description

Trichotillomania (TTM) is defined as recurrent or chronic hair pulling that (a) is preceded by an immediate increase in tension due to the pulling itself or by attempts to resist pulling; (b) results in feelings of gratification, pleasure or relief; (c) is not accounted for by another disorder; and (d) results in significant impairment or distress in important areas of functioning [1]. Due to the developmental and cognitive differences observed children and adolescents (referred to as *children* from here on), criteria (a) (preceding tension) and (b) (feeling of gratification) may not be necessary for a diagnosis of TTM in children. Similarly, hair pulling in children younger than 2 years of age may be better accounted for as a habit disorder rather than TTM.

Pulling Types and Methods

Hair pulling is generally separated into two categories: "focused" and "automatic." Focused pulling is deliberate and often done to regulate internal experiences (e.g., decrease boredom or tension). Automatic pulling occurs

habitually and without the person's immediate awareness. Focused pulling often occurs in bathrooms and in front of mirrors, whereas automatic pulling often occurs while reading or watching television. To date, three studies have examined the rates of focused versus automatic pulling [2, 3, 7]. Even though different methods were used to collect these data, it was found that between 15 and 34% of adults reported pulling that was largely focused and between 5 and 47% reported pulling that was mainly automatic. It is commonly believed that most individuals present with both types of pulling or fall on a continuum between focused and automatic pulling. Recent research shows that these constructs also capture childhood TTM [8].

The scalp is the most common pulling site in children, followed by eyelashes and eyebrows [14]. As children mature and develop hair in other areas of the body, those areas might also become pulling sites. It is estimated that 23% of children pull from a minimum of two sites [18]. Individuals with TTM often report pulling hairs that have a distinct quality such as thicker, coarser, curly, broken, or a different color than other hairs. People will often pull hairs in the hope that they can find ones that have a large follicle or a follicle that is a certain color (e.g., red from blood). Pulling is commonly done with one's fingers, but utensils such as tweezers are often used in the pulling.

After pulling, the hair may be examined and manipulated, discarded or collected, or mouthed and/or ingested. Post-pulling oral behaviors occur in approximately 48–77% of individuals with TTM [3]. Additionally, 5–18% of individuals with TTM ingest parts or entire hairs (trichophagy) which can lead to serious medical consequences [3, 4]. The development of internal hairballs (trichobezoars) can cause serious illness and in the most severe cases death [19].

Quality of Life Issues

Individuals with TTM typically pull for one or greater hours per day. Recent research examining quality of life issues in adults indicates most individuals with TTM have social impairments (e.g., decreased contact with friends, avoidance of dating, and work related distress) and negative affect as a result of their disorder. Additionally, the majority of individuals with TTM report grooming related problems, issues with physical health, and frequently avoided recreational activities [6]. Although quality of life issues have not been as extensively studied in children with TTM, specific issues include: avoidance or reluctance to attend school due to a fear of being teased by peers, habitual tardiness resulting from a loss track of time while pulling hair, difficulties with attention and concentration caused by frequent pulling in class, and criticism or punishment by teachers because of hair pulling.

Etiology and Maintenance

The most commonly espoused models for the development of TTM are neurological, animal, and behavioral. Neurological differences have been detected in individuals with TTM as compared to control participants [13, 15, 16]. In general, these findings point to a possible role within the dopamine and serotonin systems in TTM. Comparisons have been made between human hair pulling and self-injurious licking exhibited by cats and dogs. Similarly, birds sometimes pick out their own feathers for no apparent reason. Finally, mice that have mutations on the Hoxb8 gene will show excessive grooming behaviors [9]. Behavioral models generally focus on the immediate effects of the pulling in the maintenance of the disorder. Pulling serves a reinforcing function for many individuals whether it is the reduction in stress or tension or the pleasure of pulling itself.

Prevalence and Onset

Prevalence estimates for TTM vary from approximately 1–3.4% [14]. The mean age of onset for TTM is between 10.7 and 13 years of age with standard deviations of 6.3 and 8 years [3, 5]. It is generally believed that TTM is more common in adult females but that may be because females show a greater willingness to seek treatment for TTM. The gender distribution is more equal in children [12].

Comorbidity

Co-occurring disorders are common in adults with TTM, with mood, anxiety, substance use, and personality disorders being the most common. Approximately one third to two thirds of children with TTM meet criteria for a second diagnosis. Anxiety disorders and internalizing disorders are the most common.

Assessment

Validated Assessments

The *Trichotillomania Scale for Children* (TSC; [17]) specifically examines hair pulling behaviors in children by assessing severity, distress and impairment. *The Milwaukee Inventory for Styles of Trichotillomania-Child Version* (MIST-C; [8]) is helpful to determine the degree to which children with TTM have focused or automatic pulling.

Self-Monitoring/Alopecia Ratings

Treatment progress is frequently assessed using self-monitoring methods. Clients collect or count the number

of hairs pulled over a given period of time (e.g., per day or per week) which are then entered into a computer and plotted on a chart. This can serve to increase motivation for treatment because children can see their pulling decrease on the chart. Alopecia ratings are collected by taking photographs of pulling sites prior to and over the course of treatment. The photographs then allow both the client and the clinician to monitor hair growth throughout treatment.

Treatment

The first step in the treatment of TTM is a medical evaluation to rule-out a medical reason for the hair loss or pulling (e.g., ringworm, dry skin). If medical or pharmacological treatment is not warranted psychosocial interventions are the first lines of treatment. The most supported treatment for children with TTM is simplified habit reversal [11]. Simplified habit reversal involves three steps: awareness training, competing response training, and social support. Awareness training involves teaching the client to recognize the movements involved in pulling or the urges that precede pulling. These movements and the urges are labeled "warning signs." Contingent on these warning signs the client practices the competing response for 1 min. The competing response generally involves doing something else with one's hands such as making fists. Finally, a family member is taught to reinforce the correct use of the competing response. It is presumed that habit reversal is more effective with automatic pulling.

Procedures to target focused pulling have been added to the treatment of TTM such as cognitive therapy procedures [10] or procedures from acceptance and commitment therapy [20]. In addition, pharmacological interventions have been successful in treating TTM including Fluoxetine, Chlomipramine, Haloperidol, Imipramine, & Trimipramine with Chlordiazepoxide [14].

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Suggested Readings

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Suggested Website

Trichotillomania Learning Center: www.trich.org

Trileptal®

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Synonyms

Oxcarbazepine

Definition

A prescription medication FDA approved for the treatment (monotherapy or adjunctive therapy) of partial seizures in adults and children ages 4 or older with epilepsy. Also, it is approved as adjunctive therapy in the treatment of partial seizures in children two or older with epilepsy.

Description

Exactly how this medication works is not known. It is available in a tablet or as an oral suspension.

The recommended starting dose for this medication is based on weight for children and adolescents and is typically taken twice a day. Maximum suggested dose is 600 mg a day or depending on weight. The recommended starting dose for adults is 300 mg taken twice a day with the recommended daily dose being 2400 mg. The dose of this medication should be slowly increased to prevent side effects and should only be taken as directed by a doctor.

Some side effects are listed here: dizziness, tiredness, headache, upset stomach, tremor, abnormal gait, vision problems, joint pain, and weakness.

Relevance to Childhood Development

Trileptal® is FDA approved for children 2 years of age or older.

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True Twins

►Monozygotic (MZ) Twins

Trust Versus Mistrust

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Definition

Trust versus mistrust is the first stage in Erik Erikson's psychodynamic theory of psychosocial development.

Description

Erikson postulates a theory of psychosocial development that spans the lifespan and emphasizes an interaction between biological needs and the environment. According to Erikson, there are stages in development in which a child's unfolding biological needs and abilities engage the child with significant adults, resulting in interactions that help or hinder the child in meeting healthy psychosocial milestones. The patterns that emerge can be described as involving (1) key areas of the physical body, (2) the types of activity that the child is engaged in mastering at that level of development, and (3) the types of social interactions that result as the growing child relates to others with their new abilities [1]. Additionally, the resulting experiences from each stage lay the foundation for transition through the subsequent developmental stages.

Trust versus mistrust is conceptualized to coincide with infancy, defined as birth to 18 months of age. This stage is the first conflict described in Erikson's theory and coincides with the oral-sensory stages I and II in which "incorporation" [1, 3] is the most crucial action for the

infant. During this time, the infant seeks to meet their basic needs (food and physical comfort) and establish regulation (feeding, sleeping and elimination) through "incorporation" [1, 3] of input from the world. In the first part of this stage, the child learns to get what they need from the environment. In the second portion of the stage, the child learns to take a more active role in meeting their needs through burgeoning skills such as biting, grasping and discerning specific stimuli [3, 4].

The stage of trust versus mistrust is characterized by the child getting practice with trusting their caregivers to meet their needs and also with trusting themselves to cope [3]. While this experience is initially associated with biological needs, the child learns about themselves through interactions with the environment and significant others. Optimally, this period in infancy is characterized by smooth and mutually regulated interactions with the mother that comfortably satisfy the infant's needs. This interaction between mother and infant results in the infant developing trust in the mother and world that she represents. Accordingly, as this trust develops, the child can begin to accept the absence of the mother without experiencing undue anxiety. Essentially, the infant develops confidence that she will return and their environment will remain stable and predictable. This inner representation of trusted people and the formation of a qualitatively rich relationship is a cornerstone in the foundation of ego identity development. At the successful conclusion of this stage, the child emerges with a sense of trust in their caregiver, their environment and in themselves. Accordingly, if this stage is marked by unpredictable, inadequate or inconsistent care, then the child may develop a lasting sense of mistrust in the world and in themselves [3].

Relevance to Childhood Development

The Eriksonian stage of trust versus mistrust is significant to child development as it coincides with and lays the foundation for similar theories of infant development. Additionally, Erikson's ideas about the mechanism of learning to trust one's environment versus experiencing mistrust that their needs will be met converges with attachment theory and possibilities for the origins of maladaptive behaviors and psychopathology [1, 2].

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Trust Versus Mistrust (Erikson's Infant Stages)

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Definition

Erik Erickson's Trust versus Mistrust stage is the first of eight stages in his psychosocial life-span development model.

Description

Erik Erickson accepted the basic ideas of Freudian theory; however, he expanded on it by developing a life-span psychosocial dimension to Freud's theory of psychosexual development. In other words, Erickson believed that an individual is influenced by parental figures and the environment. Unlike Freud, he also believed that the personality continues to develop after the age of 5 [1].

According to Erickson's psychosocial model of development, an individual's personality becomes increasingly differentiated and hierarchically organized as it unfolds in, and is shaped by a particular environment. There are eight stages in Erickson's psychosocial model that involve a crisis or conflict. Each stage builds on successful completion of an earlier stage. If the crisis is successfully resolved then the result is adjustment, if not, then the result is maladjustment and will likely pose as a problem in the future [2].

The first stage in Erickson's psychosocial model of life-span development is called *Basic Trust versus Basic Mistrust* and is the stage that generally takes place between birth to 1 year of age. The main task in the first stage is to acquire a favorable ratio of trust to mistrust that most likely develops from the mother or primary caregiver. Trust is the foundation that gives the child a good chance of coping with later crises [5].

Caregivers are the most important figure in the child's life during the trust stage, as the infant depends on the mother or father to feed them when they are hungry and to comfort them when they are afraid or in pain. The child will ultimately tolerate having their mother out of sight because they are confident that she will return. Infants also

develop trust in themselves from the feeling that others accept them and from increased familiarity with their bodily urges. If the child's environment is trustworthy, the virtues of hope and confidence are instilled [4].

It is during this stage that the infant also learns what to fear and what not to fear. In fact, some mistrust is critical in order to allow detection of impending danger or discomfort and to discriminate between honest and dishonest people. However, if more mistrust is developed than trust, the child may be frustrated, hopeless, withdrawn, suspicious and lacking in self confidence.

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Turner Syndrome

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Synonyms

Genetic disorder; Monosomy X; Ullrich–Turner syndrome

Definition

Turner Syndrome (TS) is a chromosomal abnormality that only occurs in females. This genetic disorder leads to a variety of physical, medical, psychosocial, behavioral, and academic challenges, affecting approximately 1 out of every 2,000–3,000 live births. Prevalence is similar across all races and ethnicities [7].

Description

Several different types of TS exist, with the most common form of TS referred to as "pure TS", a diagnosis that occurs in about 50% of diagnosed females [7]. Females with this type of TS have 45, X0, and demonstrate an absence of one of the X chromosomes that the fetus should have received from either parent [7]. Individuals with this karyotype have more pronounced features of TS and are often diagnosed at a younger age. Another form of TS that occurs in about 30–40% of diagnosed females is "mosaicism." In mosaicism, the cell division that replicates the chromosomes fails to replicate the genetic material completely and some cells contain a different set of chromosomal material [7]. Diagnosis of this karyotype is often challenging given that females with this form of TS demonstrate fewer syndromic features. Other forms of TS occurring infrequently in the population feature partial deletion of one arm of the X chromosome, or a duplication of one arm of the X chromosome with the loss of the other arm [7].

Several common physical abnormalities have been found among females diagnosed with TS. These physical characteristics include short stature (somewhere between 4 feet 6 inches and 4 feet 10 inches tall), lack of spontaneous development of secondary sexual characteristics due to gonadal dysgenesis, a webbed neck, broad chest, skeletal and facial abnormalities, high-arched palate, hypoplastic or underdeveloped nails, low posterior hairline, and low-rotated ears [7]. Short stature is the most common and apparent physical abnormality in females diagnosed with TS, resulting from the loss of the SHOX (short stature homeobox-containing) gene on the X-chromosome which is important for long bone growth [7]. On average, affected females are approximately 20 cm shorter than their suspected height, and they tend to grow disproportionately and have a stocky appearance with a wide body and large hands and feet [2]. In order to attain a normal height as quickly as possible and progress through puberty at a normal age, growth hormone treatment is recommended for girls with TS [2].

Diagnosis of TS typically occurs when a female reaches late adolescence. Hearing loss is also common among females with TS. About 50% of females with TS have mild hearing loss, 60% have sensory neural hearing loss, and 25% have conductive hearing loss [6]. Hearing loss may be the result of recurrent otitis media and chronic middle ear infections [6]. Given the prevalence of hearing loss in females with TS, it is important to regularly assess hearing and middle ear function. Females with TS may evidence congenital cardiovascular defects including bicuspid aortic valve and coarctation of the aorta [9]. Approximately 3–8% of girls with TS have aortic root dilatation which can lead to aneurysms, aortic rupture, and even death [9]. Therefore, it is important for all girls who have been diagnosed with TS to regularly receive a cardiac evaluation along with a complete physical examination.

Relevance to Childhood Development

Research has demonstrated that females born with TS have Verbal IQ scores that are similar to the general population, while typically attaining lower Performance IQ scores in comparison to peers their same age [7]. Females born with TS tend to have difficulties with tasks that are largely nonverbal in nature including visual-spatial processing, visual memory, visual constructional skills, arithmetic, and executive functioning. It has been suggested that the cause of these difficulties stems from right-hemispheric dysfunction [7]. The left hemisphere is unaffected in females who have TS, therefore, difficulties with language and symbolic operations are not often observed. The most frequently occurring academic challenge affecting school age children with TS involves mathematics [7]. Most mathematic difficulties appear to involve conceptual and factual domains, which require memory ability to facilitate problem solving. Girls with a mosaic form of TS typically evidence fewer cognitive and visual-spatial difficulties than girls with the pure form of TS [7].

Females with TS tend to have lower self-esteem, difficulty forming strong peer relationships, and are more socially isolated compared to other children [7]. Such isolation often results from physical differences and abnormalities that are readily apparent to others. Children are often teased about their height and physical abnormalities in school and may be treated according to the age they appear to be rather than their actual age, contributing to lower self-esteem and social immaturity [7]. Those children who have deficits in visual-spatial processing also have a difficult time discerning various social cues and facial expressions of others [7], while evidencing difficulty reading nonverbal communication such as tone of voice and body language [7]. Females with TS frequently demonstrate behavioral problems resulting from the aforementioned social immaturity, including poor peer relationships, hyperactivity, and attention problems [7].

Growth hormone treatment has been shown to be relatively effective in assisting those with TS reach final adult stature, can be effective as early as 9 months of age, and is FDA approved at a dose of 0.375 mg/kg per week [2]. However, despite reports of early efficacy, growth hormone therapy is not typically started until the child's height falls below the 5th percentile for healthy girls of the same age [9]. Girls may increase their height as much as 8 to 10 cm on growth hormone therapy [9]. Over 90% of females with TS experience gonadal failure, therefore, estrogen therapy is used as a way to initiate pubertal development [2]. If menses does not occur by the age of 15 years old, girls with TS are treated with estrogen therapy in order to induce breast development and other features of puberty, maintain their secondary sexual development, and protect their bones from osteoporosis [9]. Puberty should commence at a physically appropriate age in females to optimize self-esteem, social adjustment, and initiation of sexual activity [3]. Estrogen therapy should only be used in girls for feminization and should be initiated only after the child has reached her final height potential and when her bone age is 12 years or more [9]. Growth hormone therapy and estrogen treatment can lead to positive changes for females with TS, including higher self-esteem, improved social and physical functioning; however, treatment should be continuously monitored by a physician [1].

Upon diagnosis, females with TS must face several psychosocial challenges. For many children, diagnosis of TS incites change in self-concept stemming from the need to accept that they are chromosomally and physically different from others their age. Some females with TS have various physical problems that may interfere with their lifestyle and quality of life, including issues related to infertility [7]. Therefore, in treating females who are diagnosed with TS it is important to receive the most accurate medical, psychological, and developmental information and intervention. When the child is of school age it is also important for parents of children with TS to collaborate with the school in order to ensure appropriate school based intervention [7]. Overall, females diagnosed with TS function well and independently in their day-to-day lives. The most challenging issue that females with TS are confronted with is dealing with premature ovarian failure and loss of fertility [2]. Under-diagnosis or delayed diagnosis has been a problem among this population, however, early detection can help to prevent medical complications [2]. A comprehensive medical and psychological evaluation should be conducted on a regular basis in order to ensure well-being and psychological adjustment.

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Twaddling

►Babbling

Twitch

►Tics

Type 1 Diabetes

►Diabetes
►Juvenile Diabetes

Type 2 Diabetes

►Diabetes