

UNDERSTANDING AUTISM: AN INTRODUCTION FOR PARENTS**SACHIN KUMAR^{1*}, AMIT KUMAR² AND ABHISHEK SINGH³**

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ABSTRACT

Autism is currently estimated to affect approximately one in every 166 children, yet the cause or causes of the condition are not well understood. One of the current theories concerning the condition is that among a set of children vulnerable to developing the condition because of their underlying genetics. Autism is a developmental disability that affects how the brain function specifically those areas of the brain that control social ability and communication skills. Boys are more likely to develop autism, and most children are diagnosed before the age of 3. Children and adults with autism typically have difficulty in both verbal and nonverbal communication. People with autism may have a difficult time relating to the outside world and may have unusual reactions to the people around them. People with autism may demonstrate aggressive behavior that may cause injury to themselves or others. The disorder also may cause sensitivity to the senses of sight, hearing, touch, smell, and taste. Occupational therapy can provide intervention that helps children to develop appropriate social, play, and learning skills. The therapist aids the child in achieving and maintaining normal daily tasks such as getting dressed and playing with other children.

KEYWORDSAutism, Memory assessment, Autism spectrum disorder, Asperger syndrome, *Engrailed 2*.**INTRODUCTION**

One of the major health care crises currently facing the United States is the exploding incidence of autism diagnoses. Thirty years ago it was estimated that roughly one in 2500 children had autism while today it is estimated that approximately one in 166 is diagnosed with the condition more than a ten-fold increase¹. In turn,

due to the high costs of treating and caring for a typical autistic individual over his or her lifetime, it is estimated that the annual cost to society of autism is thirty-five billion dollars (Ganz 2006). Clearly, the highest priority needs to be given to better understanding what is causing the dramatic increase in diagnoses and, if possible, using that improved knowledge to reverse the trend.

Despite the recent rapid increase in diagnoses and the resulting increased attention the condition has received both in the media and in the medical community, very little is known about what causes the condition. Starting with the work of Rimland (1964), it is well understood that genetics or biology plays an important role, but many in the medical community argue that the increased incidence must be due to an environmental trigger that is becoming more common over time. However, there seems to be little consensus and little evidence concerning what the trigger or triggers might be. We empirically investigate a possibility that has received almost no attention in the medical literature, i.e., that early childhood television watching is an important trigger for the onset of autism².

Although there is very little hard evidence on the subject, many believe that, due to the growth of cable television, VCRs, and DVDs, television watching by very young children has grown dramatically over the last few decades and Anderson and Pempek (2005). It is also widely believed in the medical community that television watching is deleterious for very young children³. While a few authors have speculated that the deleterious effects of early childhood television viewing might include autism, there has been no serious empirical investigation of the issue⁴. We are interested in empirically investigating whether or not the increase in autism diagnoses over time is being at least partly driven by an increase in early childhood television watching.

Young childhood television watching is positively correlated with precipitation. This is not surprising. When it rains or snows various outdoor activities such as going to a park become difficult, so it is not surprising that when precipitation is high young children spend more time doing typical indoor activities such as watching television. If early childhood television watching is a trigger for autism, then our finding that young children watch more television when it rains or snows means that autism rates should be higher in communities that

receive a lot of precipitation, and especially among age cohorts within those communities that were exposed to a relatively large amount of precipitation. By offering more channels and channels whose target audience is young children, cable should increase the amount of time young children watch television.

What is driving our finding is not the overall growth in cable television during the time period studied, but rather that for each cohort those areas with higher autism rates are on average areas which had higher cable percentages when the cohort was very young. Also, these results persist when we include county fixed effects, in which case our cable coefficient is identified by variation within counties over time in the growth of cable.

As a final introductory point, although our perspective that early childhood television viewing may be an important trigger for autism diverges from current thinking in the autism medical research community, the idea is not inconsistent with current thought in the medical community more generally concerning early childhood development. Our hypothesis is that it is exactly the interaction between genetics and a particular type of early life experience, i.e., early childhood television watching, that can result in the profound impact on the development of the brain referred to as autism⁵.

A BRIEF PRIMER ON AUTISM

In this section we provide a brief primer on various aspects of autism. We begin by describing what is Autism?

WHAT IS AUTISM?

- Autism is a life-long developmental disability.
- Autism is a physical disorder affecting the brain that prevents individuals from properly processing and integrating information from their senses and surroundings.
- This brain disorder may cause severe problems in learning, communication and behavior.

- Autism is a spectrum disorder symptoms range from very mild to severe and can occur in different combinations from one individual to the next.
- Autism usually becomes apparent in the first three years of life but can be identified at any point in life.
- Autism can occur with other disabilities. A significant percentage of people with autism also have mental retardation.
- Autism does not prevent learning. People with autism grow, change, learn and acquire new skills throughout their lives⁶.

Autism is one of the conditions in the set of conditions referred to as the autism spectrum (the other conditions are pervasive developmental disorder not otherwise specified (PDD-NOS), Asperger syndrome, and the rare conditions Rett syndrome and childhood disintegrative disorder). We will confine the discussion to autism although some of the discussion in both the media and the medical literature concerning growth of autism is actually referring to the full spectrum⁷.

Autism is a disorder that is associated with deficiencies in three related domains. The first is language and communication. To be classified as autistic there must be a delay during the developmental period in the acquisition of language. If the individual exhibited no delay but shows other deficiencies associated with autism, then the individual is typically classified as having Asperger syndrome especially when those other conditions are mild. A severely autistic individual will never acquire language. Such individuals are typically not able to function in society independently and eventually require institutionalization of one sort or another. More mild autism is typically associated with eventual language acquisition, but typically the individual shows clear deficiencies in the pragmatic or social use of language. Back and forth conversation is difficult and the individual will frequently discuss one or two topics of interest in an obsessive fashion. There are also a range of other related

problems⁸ concerning various issues including that facial expression and gestures frequently do not match what is being said.

The second related domain is social interaction. Not surprisingly, given the deficiencies in pragmatic language skills, even high functioning autistic individuals typically find social interaction difficult. In addition, there are also a number of other aspects of the disorder that make social interaction difficult. First, autistic individuals have difficulty making appropriate eye contact during social interaction. Second, there is typically a deficiency in interpreting subtle social cues such as smiles, winks, and grimaces. Third, autistic individuals frequently exhibit what is referred to as mind blindness, i.e., they lack a conceptual understanding of what other individuals are thinking. This last characteristic can lead an autistic individual to make unintentional comments that the listener finds insulting.

The final major way in which autistic individuals show deficiencies is in terms of repetitive behaviors and obsessive interests. This set of deficiencies takes a number of different forms. One specific way this deficiency manifests itself is in terms of odd repetitive motions such as flapping arms or walking on toes. Another is in terms of a desire for consistency or sameness of everyday routines. For example, an autistic child may demand that he or she leave for school at exactly the same time every day and that exactly the same route be taken, where any deviation concerning either of these dimensions can cause the child to become extremely agitated. The last way this deficiency is manifested is in terms of obsessive interests. For example, an autistic child may become obsessed with a narrow interest such as vacuum cleaners or train schedules or wasps and want to learn everything he or she can about the topic⁸.

There are a few additional aspects of the condition that will be helpful for thinking about later results. First, autism is more common among males than

among females. Specifically, typical studies find approximately four males with the condition for every female. Second, the condition is thought to develop at the latest by three years of age. This means that, if there is some environmental trigger that is serving to cause the condition, then we should look for a trigger where exposure occurs prior to the age of three. Third, there is a debate in the literature concerning the fundamental deficit associated with the condition. That is, some argue that, of the various deficits associated with the condition, one serves as the cause of the condition while the others are outcomes of the condition. Various possibilities have been suggested for the cause including that it is what is called an executive function disorder, that mind blindness is the central cause, and that the condition is a severe attention disorder⁹. As we already be discussed in the previous section, the idea that early childhood television viewing serves as a trigger for autism makes most sense if the condition is a type of attention disorder¹⁰.

CHARACTERISTICS OF AUTISM? People with autism usually have these characteristics in common, to one degree or another:

POOR UNDERSTANDING OF SOCIAL RELATIONSHIPS: People with autism usually have poor eye contact and limited play and social interactions. They may prefer being alone. It is hard for them to understand social cues such as facial expressions and body language and the feelings of other people.

SIGNIFICANT LANGUAGE AND COMMUNICATION PROBLEMS: Studies show that about 40% of people with autism do not speak. For those who do, language is slow to develop and may include unusual speech patterns and repetitive phrases, questions and topics. People with autism often have difficulty understanding instructions or language out of context. They often need extra time to think about the words they have heard or said and to act on them. It may be hard for them to communicate their needs.

HIGH NEED FOR SAMENESS

PREDICTABILITY: People with autism may become upset with changes in the environment, schedules and the people around them. They are easily confused and often develop elaborate rituals such as lining up objects to organize themselves. They usually have a limited number of interests and activities.

IMPAIRED THINKING ABILITIES: To one degree or another, most people with autism have problems with judgment and understanding the meaning of things. They usually focus on details and are unable to see the whole or how the parts fit together. It is hard for them to separate what's important from what's not. Making choices can be troublesome. Generalization is often a challenge: for example, a child may be able to tie his or her shoes at home but not at school. People with autism typically find it very difficult to grasp abstract concepts such as clean-vs.-dirty.

ORGANIZATIONAL PROBLEMS: People with autism usually have difficulty with beginnings and endings. They may not know where to start an activity or understand what "finished" looks like. Many individuals have trouble putting tasks in order and figuring out what comes next.

SENSORY AND PERCEPTION PROBLEMS: People with autism often have inconsistent and unusual sensory responses. They can be over-reactive and under-reactive seemingly deaf to a siren but distressed by the vacuum cleaner. They may stare at lights, lick or smell things, and be attracted to or repelled by certain textures, especially in food. Their pain threshold is often high. In general, they are distracted by sensory information and are unable to filter out the unimportant details.

UNEVEN PATTERN OF DEVELOPMENT: Typically, the skills of a person with autism are scattered. They may do some things well and others not at all. A child may be able to read, for example, but unable to talk¹¹.

WHAT IS MOST DIFFICULT FOR PEOPLE WITH AUTISM? Language and social skills are the biggest challenges for most people with autism. Even the most mildly affected people with autism struggle with the complexity and abstraction of language. A person with severe autism may not understand the purpose of language that people talk to communicate with each other. Social situations also confuse individuals with autism because of the many subtle cues and personal judgments involved in personal interactions.

WHAT ARE THE STRENGTHS OF PEOPLE WITH AUTISM? Abilities vary from one individual to the next, but generally people with autism share these strengths:

- Excellent memory, especially for detail.
- Ability to follow routines.
- Appreciation for precision and accuracy.
- Strong visual skills.
- Ability to make associations quickly.

WHAT IS THE LEARNING STYLE OF CHILDREN WITH AUTISM? HOW DO THEY LEARN BEST? Most students with autism are strong visual learners. This means they understand information they can see much better than information they hear. "I think in pictures," says Temple Grandin, a woman with autism who has written several books. She explains, "Pictures are my first language and words are my second language." The thinking and organizational problems common to autism also affect the way students with autism learn. Most school programs are language-based and need to be modified for students with autism. There are a variety of educational approaches. Helping students understand their environment through concrete learning is one of the most useful strategies for students at all levels of autism. Adaptations that make the classroom and schoolwork less confusing should be part of every child's school program, regardless of the educational approach used.

These and other teaching strategies help most children with autism to:

- Better understand cause and effect relationships.
- focus on relevant details.
- understand where to begin and what next¹².

HOW IS AUTISM DIAGNOSED? Currently there are no medical tests or physical "markers" that indicate a child has autism. Instead, professionals observe the behavior of the child and study his/her developmental history to identify characteristics typical of autism. Doctors and other professionals often use the criteria listed in the American Psychiatric Association's Diagnostic and Statistical Manual (called the DSM-IV) to determine if a child has autism. There are other standard checklists used to diagnose autism, especially in very young children. As parents, you play a critical role in the diagnostic process because you have the most comprehensive information about your child's development and behavior. Obtaining a diagnosis can be difficult because many doctors and other professionals are not familiar with autism. In Oregon, doctors at the Child Development and Rehabilitation Center have expertise in diagnosing autism.

IS THERE A CURE? No. Some individuals have made remarkable gains in language and social development and can function relatively well in society but they still have autism. Behaviors may fade or change as the child grows and treatments may relieve specific symptoms but the brain dysfunction does not ever go away. Because experts know so little about what causes autism, even less is known about possible cures. However, research is going on in many areas including genetics, the auto-immune system, possible drug treatments and brain function. The scientific understanding of autism is growing more rapidly than ever. Current information on research efforts is usually available from the Autism Society of America. Autism is treatable. With careful instruction and support, most people with autism can learn to function at home and in the community. Many lead happy and fulfilling lives.

WHAT CAN HELP A PERSON WITH AUTISM?

Most people with autism benefit from:

- A consistent and predictable environment. They need concrete ways to make sense of the world to understand what happens where and when.
- An individualized learning program that is tailored to their unique learning style and builds on their strengths and interests.
- Early identification and intervention¹³.

WHAT IS THE BEST TREATMENT OR THERAPY FOR MY CHILD?

Even though there is no cure for autism, there are drugs, therapies, diets and other treatments that may help some children. Autism looks so different in each child that no one treatment for its symptoms works with everyone. For example, the drug that helps one child to sleep better may agitate another; the nutritional supplement that helps to calm one child may have no effect whatsoever for another. You are the expert on your child and will know best what works and what doesn't.

While treatments may help with some of the accompanying problems of autism, the approach that stands the test of time is individualized instruction¹⁴.

WHAT CAUSES AUTISM? No single cause for autism has been identified. Research suggests that several factors may be involved, such as viral infections during pregnancy, metabolic disorders, birth complications and genetic factors. Experts know that autism is a brain disorder, but they don't know exactly how and why the brain does not work properly in an individual with autism. There are no medical tests that show the cause of autism. Autism is not caused by bad parenting. Until autism was identified as a neurological disorder in the 1960's, many professionals blamed parents for their children's difficulties.

THEORIES OF THE CAUSES OF AUTISM

Early on there were two competing theories for the causes of autism. One theory put forth by Bruno Bettelheim and his followers was the "refrigerator mother" theory (see Bettelheim (1955, 1967))¹⁵. In this theory autism is due to a mother who does not properly bond with the child with the result that the child rejects the mother and winds up living in his or her own world isolated from social interaction. The competing theory, first argued forcefully by Bernard Rimland (1964)¹⁶⁻¹⁷, was that the condition is biological and thus genetic in nature. Over time as numerous studies found evidence in favor of a genetic component such as the twin study of Folstein and Rutter (1977)¹⁸, Bettelheim's theory eventually became discredited. Since then most researchers pay no attention to the potential role that family environment can play in the onset of autism. In fact, some authors claim that scientific findings clearly show that family environment plays no role. We have found no evidence that would support a broad claim that the family environment plays no role whatsoever in the onset of autism.

More recently with the dramatic growth in diagnoses, two possibilities have been discussed. The first is that there are one or more environmental toxins that have become more prevalent over time that serve as triggers for autism. One specific possibility that has been well researched is that there are ingredients in vaccines, such as thimerosal which is a mercury-based preservative, that serve this role. But there are a variety of studies that have looked carefully at this hypothesis and found no empirical support (see, for example, Hviid et al. (2003)¹⁹, Institute of Medicine (2004)²⁰, and Fombonne et al. (2006)²¹). Although there is still some debate concerning this issue, our reading of the literature is that most researchers in the field now believe that the vaccine hypothesis represents a deadend. A few very recent studies have investigated whether air pollution of various sorts serves as a trigger. In particular, Palmer et al. (2006)²² and Windham et al. (Forthcoming)²³ find results that suggest that

certain types of air pollution serve as important triggers for autism. Although the results are intriguing, these tests to date have been cross-sectional, which leaves open the possibility of a spurious correlation. For example, it is possible that what is driving these results is that families that are more prone to have autistic children for other reasons tend to locate in areas characterized by higher pollution levels. This possibility could be examined using time-series data and a fixed-effects specification, but so far these researchers have not employed this type of methodology²⁴. Another drawback is that these studies may not measure the “relevant” pollution level. Since as discussed earlier autism develops by the time a child turns three years old. One possibility, referred to as “diagnosis substitution,” is that over time individuals who in years past would have received a different diagnosis such as mental retardation are now receiving an autism diagnosis with a resulting increase in the reported prevalence of the condition. A number of authors have tried to look at the data to see whether this theory seems plausible, but these studies are mixed in their conclusions²⁵.

GENETICS OF AUTISM

Autism is the most common disorder in a group of neurodevelopmental disorders called the Autism Spectrum Disorders (ASD)²⁶. It is characterized by impairments in social interaction, deficits in verbal and non-verbal communication, and restricted repetitive patterns of behavior and interests. ASDs also include Asperger syndrome and pervasive developmental disorder not otherwise specified (PDD-nos)²⁶. Autism is estimated to affect 15-20 in 10,000 children, while all ASDs combined affect approximately 60 in 10,000 children. Autism is strongly genetically determined, as demonstrated by its increased prevalence in siblings. Monozygotic twins show 60%-90% concordance, meaning that in 60%-90% of cases in which one twin has autism, the other twin does also. Concordance in dizygotic twins and siblings is 5%-10%.² Males are affected with ASDs four times as often as females. The genetic

control of autism is an extremely active area of research. A rich source of data is available to researchers from the Autism Genetic Research Exchange (AGRE), a collection of DNA and clinical data from families with at least one affected individual. Combined with rapidly advancing technology, an enormous amount of genetic data attempting to explain autism has emerged. Several different genetic abnormalities have been found in autistic individuals, and affected individuals in the same family tend to carry the same genetic abnormality²⁷. Among the genes most-strongly linked to autism are *Engrailed 2* and the *Serotonin Transporter*. *Engrailed 2 (EN2)* encodes a protein involved in the development of the cerebellum. Mice that improperly express *EN2* exhibit abnormalities in cerebellar circuits and cell numbers. Cerebellar abnormalities are one of the most common histopathological findings in humans affected with ASDs, and the human *EN2* gene is located in a chromosomal region that is frequently abnormal in individuals affected with ASDs. *SLC6A4*, the gene encoding the serotonin transporter, is also implicated in ASDs. There has long been interest in this gene because approximately one-third of patients with ASD have platelet hyperserotonemia, a condition thought to be caused by variations in *SLC6A4*. Recent cloning studies identified four *SLC6A4* sequence variants that correlated with increased severity of rigid-compulsive Behaviors. Much work remains to conclusively link *EN2*, *SLC6A4*, and other candidate genes to autism, but research uncovering the genetic control of autism is ongoing and promising. The large number of genetic abnormalities found in families with at least one autistic individual has led to a theory that there are several genetic loci that contribute to the autism phenotype. Patterns of inheritance in families and the observation that some individuals show subtle symptoms, suggest that common forms of ASDs are the result of multiple genes, which when abnormal in an individual, contribute small increments of risk to that individual. Those individuals who inherit many of the abnormal genes will exhibit more serious ASD symptoms,

yet will probably not pass on the large number of abnormal genes that they carry because of low reproductive fitness. Those individuals who inherit fewer of the abnormal genes will be only slightly affected for ASDs, but will be reproductively fit enough to pass on the few abnormal genes that they carry, perpetuating the frequency of the abnormal genes in the population²⁸.

An alternate theory explains the inheritance of autism as a result of *de novo* mutations, i.e. mutations that happen sporadically, in the parental germ line (the cells that eventually produce sperm and egg). The *de novo* mutations could happen in any of the genes critical for autism. Offspring of parents with affected germlines are at risk for autism, but for unknown reasons, females are more resistant to the abnormal gene, and show

less serious symptoms, explaining the increased incidence of autism in males. Females carrying the abnormal gene who show few symptoms are reproductively fit enough to pass the abnormality to their children, who in turn are at risk for developing autism²⁹. Diagnoses of autism have increased in the past few decades, but it is important to note that the increase is attributed to a broadened definition of ASDs and better recognition on the part of physicians of autism symptoms³⁰. There is no scientific evidence that a link exists between incidence of autism and vaccinations. Funding for autism research has grown dramatically over the last five years, and it is supporting promising research projects that continue to make strides into discovering the cause and the genetic control of autism³¹.

**AUTISM TREATMENTS (TABLE 1)³²
CURRENT INTERVENTIONS IN AUTISM — A BRIEF ANALYSIS**

	Lovaas	TEACCH	PECS
Background	also known as Discrete Trial (DT), Intensive Behavior Intervention (IBI), Applied Behavior Analysis (ABA); DT was earliest form of behavior modification; initial research reported in 1987; initial intent to achieve inclusive kindergarten readiness; has "morphed" into IBI and ABA.	stands for Treatment and Education of Autistic and related Communication handicapped Children; over 32 years empirical data on efficacy of TEACCH approach exists; includes parents as co therapists; recognizes need for supports from early childhood through adulthood; main focus is on autism rather than behavior.	stands for Picture Exchange Communication System; derived from need to differentiate between <i>talking</i> and <i>communicating</i> ; combines in-depth knowledge of speech therapy with understanding of communication where student does not typically attach meaning to words and lack of understanding of communication exists; high compatibility with TEACCH.
Goals	teach child <i>how to learn</i> by focusing on developing skills in attending, imitation, Receptive/expressive language, preacademics, and self-help.	provide strategies that support person throughout lifespan; facilitate autonomy at all levels of functioning; can be accommodated to individual needs.	Help child <i>spontaneously</i> initiate communicative interaction; help child understand the <i>function</i> of communication; develop communicative competency.
How Implemented	uses ABC model; every trial or task given to the child consists of: antecedent — a directive or request for child to perform an action, behavior — a response from the child that may include successful performance, non-compliance, no response, consequence — a reaction from the therapist, including a range of	clearly organized, structured, modified environments and activities; emphasis on visual learning modalities; uses functional contexts for teaching concepts; curriculum is individualized based on individual assessment; uses structure and predictability to promote spontaneous communication	recognizes that young children with autism are not strongly influenced by social rewards; training begins with functional acts that bring child into contact with rewards; begins with physically assisted exchanges and proceeds

	responses from strong positive reinforcement to faint praise to a negative "No!", pause — to separate trials from one another (intertribal interval).		through a hierarchy of eight phases; requires initial ratio of 2:1.
Reported Outcomes	First replications of initial research reporting gains in IQ, language comprehension and expression, adaptive and social skills.	gains in function and development; improved adaptation and increase in functional skills; learned skills generalized to other environments; North Carolina reports lowest parental stress rates and rate of requests for out-of-home placement, and highest successful employment rates	Pyramid Educational Consultants report incoming empirical data supporting: increased communicative competency among users (children understanding the <i>function</i> of communication); increasing reports of emerging spontaneous <i>speech</i> .
Advantages of Approach	recognizes need for 1:1 instruction; utilizes repetitions of learned responses until firmly imbedded; tends to keep child engaged for increasing periods of time; effective at eliciting verbal production in select children; is a "jump start" for many children, with best outcomes for those in Mild-to-moderate range. heavily	dynamic model that takes advantage of and incorporates research from multiple fields; model does not remain static; anticipates and supports inclusive strategies; compatible with PECS, Floor Time, OT, PT, selected therapies; addresses sub-types of autism, using individualized assessment and approach; identifies emerging skills, with highest probability of success; modifiable to reduce stress on child and/or family.	helps to get language started; addresses both the communicative and social deficits of autism; well-suited for pre-verbal and non-verbal children AND children with a higher Performance IQ than Verbal IQ; semantics of PECS more like spoken language than signing.
Concerns with Approach	heavily promoted as THE approach for autism in absence of any comparative research to support claim; no differentiation for subtypes when creating curriculum; emphasizes compliance training, prompt dependence; heavy focus on behavioral approach may ignore underlying neurological aspects of autism, including issues of executive function and attention switching; may overstress child and/or family; costs reported as high as \$50,000 per child per year; prohibits equal access.	belief that TEACCH "gives in" to autism rather than fighting it; seen by some as an exclusionary approach that segregates children with autism; does not place enough emphasis on communication and social development; independent work centers may isolate when there is a need to be with other children to develop social skills.	may suppress spoken language (evidence is to the contrary).
Errors to Avoid	creating dependency on 1:1; overstressing child or family; interpreting all behaviors as willful rather than neurological manifestations of	failing to offer sufficient training, consultancy, and follow-up training to teachers for program to be properly implemented; treating TEACCH as a single classroom approach rather	failing to strictly adhere to the teaching principals in Phase I; tendency to rush through Phase I or to use only

	<p>syndrome; ignoring sensory issues or processing difficulties; failing to recognize when it is time to move to another approach.</p>	<p>than a comprehensive continuum of supports and strategies; expecting minimally trained teacher to inform and train all other personnel in TEACCH approach; failing work collaboratively with parents.</p>	<p>one trainer; providing inadequate support or follow-up for teacher after attending two-day training; training only one person in approach rather than all classroom personnel; inconsistently implementing in classroom.</p>
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AUTISM TREATMENTS (TABLE 2)³²
CURRENT INTERVENTIONS IN AUTISM — A BRIEF ANALYSIS

	Greenspan	Inclusion	Social Stories
Background	<p>also known as “Floor Time,” DIR (Developmental Individual-Difference, Relationship-Based) Model; targets emotional development following developmental model; depends on informed and acute observations of child to determine current level of functioning; has child-centered focus; builds from the child; “Floor Time” is only one piece of a three-part model that also includes spontaneity along with semi-structured play, and motor and sensory play.</p>	<p>initially intended for children with mental retardation and disabilities other than autism; sociological, educational, and political mandates in contrast to psychology as root source for other approaches; inclusion defined in three federal laws — PL 94-142, REI, and IDEA educate children with disabilities with NT children to the maximum extent possible;</p>	<p>also known as Social Scripts; developed by Carol Gray in 1991 initially to help student with autism understand rules of a game; was further developed to address understanding subtle social rules of “Neurotypical” culture; addresses “Theory of Mind” deficits (the ability to take the perspective of another person).</p>
Goals	<p>targets personal interactions to facilitate mastery of developmental skills; helps professionals see child as functionally integrated and connected; does not treat in separate pieces for speech development, motor development, etc.</p>	<p>educate children with disabilities in the Chronological setting they would be in if they had no disability and they lived at home; does not apply separate educational channels except under specific circumstances.</p>	<p>Clarify social expectations for students with ASD; address issues from the student’s perspective; redefine social misinterpretations; provide a guide for conduct or self management in specific social situations.</p>
How Implemented	<p>teaches in interactive contexts; addresses developmental delays in <i>sensory modulation, motor planning and sequencing, and perceptual processing</i>; usually done in 20-minute segments followed by 20-minute breaks, each segment addressing one each of above-identified delays.</p>	<p>children with autism typically placed in Inclusive settings with 1:1 aide; curriculum modified to accommodate to specific learning strengths and deficits; requires team approach to planning; approach may be selective inclusion (by subject matter or class), partial inclusion (1/2 day included, 1/2 day separate instruction), or full, radical inclusion with no exceptions.</p>	<p>stories or scripts are specific to the person, addressing situations which are problematic for that individual; Social Stories typically comprised of three types of sentences: perspective, descriptive, and directive; types of sentences follow a ratio for frequency of inclusion in the Social Story; Social Story can be read TO or BY the person with autism; introduced far enough in advance of situation to allow multiple readings, but especially <i>just before</i> the situation is to occur.</p>

Reported Outcomes	teaches parents how to engage child in happier, more relaxed ways; hypothetically lays stronger framework for future Neurological/cognitive development.	in <i>certain circumstances</i> , some children with autism can survive and even become more social in classrooms with NT peers; benefits children who cognitively match classmates.	Stabilization of behavior specific to the situation being addressed; reduction in frustration and anxiety of students; improved behavior when approach is <i>consistently</i> implemented.
Advantages of Approach	addresses emotional development in contrast to other approaches, which tend to focus on cognitive development; avoids drilling in deficit areas, which feeds child's frustrations and highlights inadequacies; is a non-threatening approach; helps to turn child's actions into interactions.	More opportunities for role modeling and social interaction; greater exposure to verbal communication; opportunities for peers to gain greater understanding of and tolerance for differences; greater opportunities for friendships with typically developing peers.	Developed specifically to address autistic social deficits; tailored to individual and specific needs; is time and cost efficient/ flexible.
Concerns with Approach	does not focus on specific areas for competency; no research to support efficacy for children with autism; approach based on hypotheses, not research; is a more passive approach.	<i>automatic</i> inclusion violates spirit and letter of IDEA; opportunities for successful inclusion begin to plateau by end of third grade as work becomes more abstract and faster paced; increasing use of language based instruction puts students with autism at great disadvantage; sensory and processing difficulties tend to be insufficiently accommodated; regular education setting not necessarily best learning environment for students with autism; teachers and students in inclusion classrooms are typically ill prepared to receive student.	supportive data is anecdotal rather than empirical; benefit depends on skill of writer and writer's understanding of autism, as well as writer's ability to take an autistic Perspective.
Errors to Avoid	attempting to implement approach without training or professional oversight; taking the lead, trying to get the child to do what YOU think he should do; allowing inadequate time; attempting to implement in midst of ongoing activities for other children.	providing insufficient training, preparation, information, and support to personnel; placing student in settings where level of auditory and visual stimulation is typically too intense; assigning student work in which cognitive demands exceed student's ability to comprehend; depending on support of 1:1 aide; maintaining placement in face of frequent or severe disruptive behaviors; focusing on academics to detriment or exclusion of functional competencies; not offering multiple opportunities to apply functional skills	including too many directive sentences in proportion to perspective and descriptive sentences; stating directive sentences in inflexible terms (e.g., "I will do ___" rather than "I will try to ___"); writing above the person's cognitive developmental age; using complex language; not being specific enough in describing either the situation or the desired behavioral response.

CONCLUSION

Autism is one of the most severe and disruptive of childhood disorders. With both genetic and environmental elements at work in it, autism (which affects boys at least three times more often than girls and is found in all races and throughout the world) is a communicative disorder distinguished by a number of often dramatic and sometimes even violent symptoms. Autism is a neuropsychiatric disorder that disrupts the typical development of social, communicative and cognitive skills. These symptoms often appear within the first three years of the child's life. In the social domain, autistic individuals are unable to form typical peer relationships and interact reciprocally with others. They often exhibit strange behavior that alienates them from others. Communicative delays are characterized by a delay or lack of language. In the case of verbal individuals, they are unable to start or maintain a conversation; their speech is characterized by echolalia (repetitive speech) and idiosyncratic language. The development of their cognitive skills is limited because of their restricted range of interests and activities. There is an effective therapy both medically & surgically; further consultations of Neurosurgeon, Neurologist, Psychiatrist, Psychologist, Audiologist, Speech pathologist and Physical and occupational therapy specialist may be required time to time. Family members of people with Autism will also need help in coping with the stresses of the disease. Social and Emotional support can help with family relationships and antisocial behavior.

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