Treatment and Prevention of Dysfunctional Behavior in Adolescents Diagnosed within the Category of Pervasive Developmental Delay.*

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Introduction

What is a pervasive developmental delay? Is a diagnostic description of Pervasive Development Delay, Not Otherwise Specified (PDD, NOS) helpful to the individual, his family and those responsible to provide treatment?

The purposes of a diagnosis are to precisely describe a condition in need of treatment, and to determine from the described symptoms a preferred regimen of treatment. Further, the diagnosis should state that if a treatment is provided, then a prediction may be made of a prognosis. The correctness of the diagnosis is critical to the identification of needed treatment resources that should be present in order to habilitate or rehabilitate the individual. Resource identification and allocation are expected consequences of a diagnosis.

The diagnosis of Pervasive Developmental Delay or Pervasive Developmental Delay, Not Otherwise Specified (DSM-IV PDD, NOS) is, in recent clinical experience, a more frequently observed diagnostic label in the literature, as well as present in the description of individuals referred for treatment to residential treatment settings and special education classrooms.

Individuals with a Pervasive Developmental Delay, Not Otherwise Specified diagnosis are those persons who do not fit all of the criteria for a cluster of diagnoses that are part of a spectrum of disorders that involve developmental delays (see Chart 1).

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Diagnosis	Onset of Symptoms	Gender	Social Skills	Head Circumference	Language Skills	Cognitive Functioning	Motor Skills
Autism	Prior to age 3 years. Symptoms in infancy are subtle.	Males (8 times greater than females)	Social skill deficits		Delay, or lack of development	75% have mental retardation	Repetitive and Stereotyped
Rett's Disorder	Five months normal development; diagnosed between 5-48 months	Females	Loss of social interaction early; may develop later	Decelerates between 5 - 48 months	Expressive and receptive language problems	Severe to profound mental retardation	"Hand-Wringing"; gait and truck coordination problems
Childhood Disintegrative Disorder	Two years normal development; diagnosed before age 10	Males - more common	Loss of social skills (after age 2 years)		Expressive or receptive (after age 2 years)	Severe mental retardation (usually)	Loss of motor skills after age 2 years
Asperger Syndrome	Recognition and diagnosis later (e.g., school age, between ages 7 - 11 years)	Males (8 times greater than females)	Social skill deficits		No general delay in language; but pragmatic language deficits. Theory of Mind - Subvocal Speech	Normal IQ Verbal Performance Deviation	Motor delays and clumsiness: Absence of research
PDD, NOS	Does not meet criteria for any of the above, but has some of the behaviors	Does not meet criteria for any of the above, but has some of the behaviors	Does not meet criteria for any of the above, but has some of the behaviors	Does not meet criteria for any of the above, but has some of the behaviors	Does not meet criteria for any of the above, but has some of the behaviors	Does not meet criteria for any of the above, but has some of the behaviors	Does not meet criteria for any of the above, but has some of the behaviors

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Chart 1

It is apparent from the comparison of the DSM-IV diagnostic classifications that describes Pervasive Developmental Delay sets of symptoms, that PDD, NOS does not fit within the symptom clusters of other diagnoses of different developmental delay profiles.

A Pervasive Developmental Delay, Not Otherwise Specified description is more clearly what it is not than what it is.

Pervasive Developmental Delay, Not Otherwise Specified is not Autism, Asperger Syndrome, Rett's Disorder or Childhood Disintegrative Disorder. It is sufficient to say that Rett's Disorder and Childhood Disintegrative Disorder have characteristics that are identifiable to distinguish each from the other, as well as from Autism and Asperger Syndrome.

Autism and Asperger Syndrome are diagnostic classifications that are less clearly distinguishable (Schopler et al., 1998; Klin et al., 1995; Barnhill, 2000).

It is argued by researchers that Autism is a separate diagnosis (Frith, 1991) and that Asperger Syndrome is clearly differentiated from other pervasive developmental profiles of delay (Gilchrist, 2001).

There is a strong case made through various researches that Autism, and High Functioning Autism, and Asperger Syndrome are aspects of a continuum that reflect a spectrum of developmental delay (Volkmar et al., 1998; Rourke, 1995).

The current DSM-IV and ICD-10 of the World Health Organization criteria for the diagnosis of Asperger Syndrome further illustrate that the differences in criteria for diagnosis threaten the external validity of a correct diagnosis (DuCharme & McGrady, 2004) (See chart 2).

ASPERGER SYNDROME CRITERIA

	DSM-IV	ICD-10
Qualitative impairment in social interaction	X	X
Restricted repetitive and stereotyped patterns of behavior, interests and activities	X	X
No general language delay	X	X
No delay in cognitive development	X	X
Normal general intelligence (most)		X
Markedly clumsy (common)		X
No delay in development of: • age appropriate self-help skills • adaptive behavior (excluding social interaction) • curiosity about environment	X	

Chart 2

Determining a precise differential diagnosis of the pervasive developmental delays evident in the symptom profile of an individual currently remain problematic. The consequent ramifications are also evident:

1. unclear diagnostic criteria result in error and misdiagnosis
2. misdiagnosis causes error in the selection of type and duration of treatment
3. treatment misapplications yield poor prognosis and little evidence of efficacy

There are risks in asserting data and evidence for rates of occurrence of types of developmental delays among children, adolescents and adults. Prevalence for Autistic Disorder based on epidemiological research suggests 2-5 per 10,000. Rett's Disorder is much less common and is reported to be only in females.

Childhood Disintegrative Disorder is less frequent in occurrence than Autistic Disorder and is more frequently associated with males.

The prevalence of Asperger Syndrome is limited by the validity measures associated with basic researches. Ehlers and Gillberg (1993) report the prevalence of Asperger Syndrome to be 26-36 per 10,000 school age individuals. Asperger Syndrome is clearly the more numerous group of individuals among those under discussion. Paul Shattuck in his 2002 presentation at the Gatlinberg Conference for Research on Mental Retardation and Developmental Disabilities detailed prevalence data of Autism in public schools. He reports an increase of 24% between 1994 to 2000 (Blacher, 2002). Other researchers from Queens College and the Texas Center for Autism Research and Treatment report the same trends in prevalence data (Blacher, 2002) in *Exceptional Parent Magazine*, (2002), Oct., 94-97.

Klin et al. (1995) conclude that Asperger Syndrome appears to be a "very mild" form of Pervasive Developmental Disorder. The authors question the face value of creating the Asperger Syndrome grouping apart from the Pervasive Developmental Disorder, Not Otherwise Specified category. This idea of a broadband diagnostic grouping creates the need for criteria that are determinant of what constitutes a "significant" delay and what combination of delayed performances indicate pervasiveness. Further, the status of a developmental delay does not imply that there will be continued future development toward the maturation of that measured delay.

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Over the last decade, researchers have explored the basis for Asperger Syndrome. Some of that research yields evidence that resolves the question, Does Asperger Syndrome exist?

A search of the literature using the keyword "Asperger" produced three hundred eighty-five studies, articles, and other references. One hundred sixty-six studies pertained to diagnosis. The researchers, whose purpose was to clarify issues related to the validity of Asperger Syndrome, are the primary sources for the following discussion. Their articles examine the requirements of a system that differentiates among Autism, Asperger Syndrome, High Functioning Autism, Pervasive Developmental Delay, Not Otherwise Specified and Non-Verbal Learning Disability.

Raja and Anzzoni (2001) discuss the autistic condition described almost simultaneously by Dr. Asperger in Vienna (1944) and Dr. Kanner (1943) in Baltimore. Both men were medically trained in Vienna at about the same time.

Dr. Kanner (1943) described the characteristics of children that he diagnosed as having infantile autism. Dr. Asperger (1944) made observations of children in his hospital unit in Vienna that he characterized as "autistic psychopathy" (Frith, 1991). Dr. Kanner's diagnosis of infantile autism is more severe than Dr. Asperger's label. Their work has inspired decades of research that attempts to clarify the differences and similarities between the two clinical descriptions.

In recent years Asperger Syndrome (AS) was considered to be a Pervasive Developmental Disorder and was included as a new diagnosis in the World Health Organization (1992) International Classification of Diseases (ICD-10) and the United States (1994) Diagnostic and Statistical Manual of Mental Disorders (DSM-IV). For a comparison of factors included in the diagnoses, see chart 2.

Eisenmajer et al. (1996) point out that the DSM-IV criteria for Asperger's Disorder (AsD), (now called Asperger Syndrome), is the same as that for Autism Disorder (AD) with three exceptions:

1. Communication and imagination impairment criteria for Autism Disorder are not listed for AsD.
2. The child with an AsD diagnosis is described not to suffer from a clinically significant general delay in language; e.g.,single words by age 2 years and phrases by age 3.
3. The child with AsD does not have a clinically significant delay in cognitive development, the development of age appropriate self-help skills, adaptive behavior, or curiosity about the environment.

Raja and Anzzoni (2001, p. 285-293) state that " . . . the syndrome Hans Asperger originally described may not be captured by the present DSM-IV or ICD-10 criteria."

There are differences between the diagnostic criteria provided by the DSM-IV and the ICD-10. While the ICD-10 endorses the traits of normal intelligence and clumsy behavior, the DSM-IV does not include those traits. Further, the DSM-IV lists that there is no delay in the development of age appropriate self-help skills, adaptive behavior (excluding social interaction), and curiosity about the environment. Note that the ICD-10 does not list these criteria.

Behavior Patterns

Fundamental differences in criteria produce a serious threat to the external validity of the diagnosis of Asperger Syndrome. The similarity between an Autistic Disorder diagnosis and a Pervasive Developmental Disorder, Not Otherwise Specified (PDD, NOS) diagnosis adds to the difficulty in interpreting diagnostic categories.

Leekham et al. (2000) developed algorithms for a Diagnostic Interview for Social and Communication Disorders (DISCO). The interview models were used to compare the ICD-10 for AS with those developed by Gillberg in 1993. Two hundred (200) children and adults were studied, all of whom met the ICD-10 criteria for childhood autism or atypical autism. Only 1% met the ICD-10 criteria for Asperger Syndrome. Forty-five (45) percent of the sample met the Asperger Syndrome criteria defined by Gillberg. The study revealed that the discrepancy in diagnoses was due to the ICD-10 requirement for "normal" development of cognitive skills. Gillberg's criteria showed that the participants diagnosed with Asperger Syndrome differed significantly from others on all but two Gillberg criteria. The authors question the benefit of defining a separate AS subgroup. They suggest, as do Klin et al. (1995), Volkmar et al. (1998), and Schopler et al. (1998) that a dimensional view of the autistic spectrum is more appropriate than a categorical one. The definition of a "syndrome" or pattern of symptoms along a continuum is more useful than the term "disorder".

Gillberg's six criteria (Ehlers and Gillberg, 1993) comprise social impairments, narrow interests, repetitive routines, speech and language peculiarities, non-verbal communication problems and motor clumsiness. Gillberg includes Szatmari's et al. (1989) criteria and Tantam's (1988) five criteria. The ICD-10 and DSM-IV note an absence of any clinical delay in language and cognitive development in the first 3 years of life. The DSM-IV adds no delay in the development of self-help skills, adaptive behavior, and curiosity about the environment. Gillberg's (Ehlers and Gillberg, 1993) broader criteria appears to differentiate between groups more reliably than do either the DSM-IV or ICD-10.

It is also important to note that the developmental signpost of 3 years of age for evidence of delays may be too limiting, as critical functions may become deficient over time, through subsequent developmental stages. Also, the criterion of an IQ of 70 or above may place the lower level too low, given the normal range of IQ that other researchers use as the standard for an Asperger Syndrome characteristic. Other research (DuCharme, 2003) suggest that patterns of pragmatic skill deficits persist across ages for Asperger Syndrome individuals. These language patterns require further investigation.

Comparing Diagnoses

Research suggests that a dimensional view of the autism spectrum is more appropriate than the categorical approach represented by the ICD-10 and DSM-IV. A dimensional view considers patterns of symptoms, or characteristics, and degrees of severity.

Ozonoff et al. (2000) compared twenty-three (23) children with High Functioning Autism with twelve (12) children who were diagnosed with Asperger Syndrome. Both groups were matched for chronological age, gender and intellectual ability. The sources of difference between the groups are categorized as cognitive functions, current symptoms, and early history. The authors conclude that High Functioning Autism and Asperger Syndrome involve the same symptomatology and differ only in degree of severity.

When comparing length of time in special education, the authors found that High Functioning Autism students remained in special education self-contained classes longer than Asperger Syndrome students.

Klin et al. (1995) report on the validity of neuropsychological characterization of Asperger Syndrome and the convergence of Asperger Syndrome with Non-Verbal Learning Disability. Their research used the ICD-10 diagnostic criteria. The authors compared neuropsychological profiles of Asperger Syndrome (AS) and High Functioning Autism (HFA) and the assets and deficits described by the term “non-verbal learning disability” (NLD) reported by Rourke (1995). The groups were described to differ significantly in eleven neuropsychological areas.

The aspects of Non-verbal Learning Disorder, typical of child functioning, include deficits in tactile perception, psycho-motor coordination, visual-spatial organization, non-verbal problem solving, appreciation of incongruity, and humor. The Non-verbal Learning Disability child demonstrates poor pragmatic language skill and impaired prosody in speech, along with deficits in social perception, social judgment and social interaction skills. All of these examples of child functioning for Non-verbal Learning Disability are also typical of the Asperger Syndrome child. Both groups, Asperger Syndrome and Non-verbal Learning Disability, also share the tendency toward social withdrawal and mood disorder (Klin et al., 1995). Non-verbal Learning Disability is not part of the diagnostic nosology of either the ICD-10 or DSM-IV.

Schopler and Mesibov (1998) identify the similar characteristics of High Functioning Autism and Asperger Syndrome. They support the notion of “symptom overlap” between Autism, High-Functioning Autism, and Asperger Sydrome. Manjiviona and Prior (1999) reported that higher IQ scores among Asperger Syndrome students account for the differences. Klin et al. (1995) reported that although the Asperger Syndrome and High Functioning Autism groups did not differ in full scale IQ, the verbal – performance differential (VIQ – PIQ) were significantly different. The Asperger Syndrome group demonstrated a higher verbal IQ and lower performance IQ in comparison to the High Functioning Autism group.

The degree of overlap between the psychiatric diagnoses Asperger Syndrome, High Functioning Autism, and the neuropsychological characterization of Non-verbal Learning Disability (NLD), indicates a high degree of concordance between Asperger Syndrome and Non-verbal Learning Disability. The neuropsychological description of Non-verbal Learning Disability assets and deficits is a model for Asperger Syndrome, but not for High Functioning Autism. It is <u>not</u> useful then, to identify Non-verbal Learning Disability as a separate diagnostic group apart from Asperger Syndrome.

Characteristics of Asperger Syndrome:

Motor Development

It is reported that delayed motor milestones and the presence of motor clumsiness are Asperger Syndrome characteristics. But there is a paucity of research to corroborate a clear association between motor delay and other Asperger Syndrome characteristics (Ghaziuddin and Butler, 1998).

Motor development and "clumsiness" were investigated by Ghaziuddin and Butler (1998), Ghaziuddin et al. (1994). The authors found no significant relationship between coordination scores and diagnostic category after adjusting scores for intelligence.

Weimer et al. (2001) suggest that the motor clumsiness reported by Green, et al. (2002) and Miyahara et al. (1997) may be the result of the proprioceptive deficits that underlie the cases of uncoordination observed in some Asperger Syndrome cases.

Motor delay and early language delay prior to age three are not predictive of other Asperger Syndrome characteristics or of later developmental problems. The definition of "language delay" may be too limited as this usually pertains to the child's saying single words or simple phases.

Speech and Prosody

Shriberg et al. (2001) investigated the speech and prosody characteristics of adolescents and adults with High Functioning Autism and AS. Prosody includes phrasing, variability in speech production, same word duration in sentences, and grammatical placement of stressed and unstressed syllables and words. Voice loudness, pitch and quality were also compared.

There were minor differences between Asperger Syndrome and High Functioning Autism subjects in volubility differences and articulation errors. Asperger Syndrome subjects used higher volume, and there was a high prevalence of speech-sound distortion in both groups.

Findings associated with prosody and voice analyses identified significant differences between clinical and control groups in the areas of phrasing, stress, and nasal resonance. Two-thirds of the Asperger Syndrome speakers were coded as having non-fluent phrasing on more than 20% of their utterances. It is speculated that Asperger Syndrome individuals use repetition and revision to compensate for formulation difficulties. There is also a suggestion that increasing length of utterance is associated with increased phrasing errors. Higher levels of grammatical complexity were also associated with increased phrasing errors and length of utterance.

Gilchrist et al. (2001) compared adolescent Asperger Syndrome, High Functioning Autism, and Conduct Disorder (CD) diagnoses as to behavioral and speech abnormalities. The findings for the Asperger Syndrome group were as follows: 1) demonstrated less severe behavioral abnormalities than the autism group; 2) were unlikely to have speech abnormalities; 3) had other communication and social behavior difficulties similar to High Functioning Autism; 4) did better in structured one-to-one conversation than other groups.

Language and Meaning

Jolliffe and Baron-Cohen (2000) examined linguistic processing in high functioning adults with Autism or Asperger Syndrome. The ability to establish causal connections and to interrelate "local chunks" (see footnote 1) into higher-order "chunks" so that most linguistic elements are linked together thematically is defined as "global coherence". The authors hypothesized that adults on the Autism Spectrum, including Asperger Syndrome, would have difficulty integrating information so as to derive meaning. Results showed that the clinical groups were less able to arrange sentences coherently and to use context to make a global inference.

The findings of the study on the abilities called "global coherence" are inconsistent with the classroom experience of adolescent High Functioning Autism and Asperger Syndrome student performance at TLC (DuCharme & McGrady, 2003). Thirty (30) students were assigned a task with directions for writing a news story. They were given seven statements of instruction and ten individual descriptive informational statements, six of which were relevant to a theme, and four, irrelevant. The

assignment was to create a news story that had a main point by selecting relevant information from the sentences provided. All thirty (30) students successfully completed the task set, but demonstrated an inability to select information less relevant or irrelevant to the main theme.

1 Chunking. The process of reorganizing materials in working memory to increase the number of items successfully recalled.

Jolliffe and Baron-Cohen (2000) required an inference and use of connotative meaning to demonstrate comprehension. Global coherence may be different from inference. TLC student behavior demonstrated the ability to identify a main theme and related, supporting data that were "coherent". No inference was required. But students were not able to differentiate the relative importance of information provided.

The "global coherence" requirement of the Jolliffe & Baron-Cohen (2000) study to interpret and infer within the context of a story is different from combining facts into a coherent statement or conclusion. The definition of their task has connotative implications. Connotative and denotative meaning derive from linguistic processes that may differ from the processes used to infer meaning from factual content.

Frith (1994), and Minshew et al. (1995) describe linguistic difficulties present when an Asperger Syndrome person is given complex interpretive language tasks. Deficits were found in complex information processing abilities. However, linguistic basic skills were preserved.

Channon et al. (2001) presented video taped real-life problems to thirty (30) pre-teen and adolescent youth. Fifteen (15) were diagnosed with Asperger Syndrome and fifteen (15) were placed in a control group. The Asperger Syndrome group differed in their ability to provide socially appropriate solutions to the problems as compared to the control group responses. The inability to draw inferences and to assign appropriate attribution to key factors present in social situations are also discussed by Barnhill (2001) and Barnhill and Myles (2001).

Cognitive Processes

Cognitive flexibility required to solve a novel problem, or a familiar problem in a novel situation is absent for Asperger Syndrome persons to a degree beyond what their normal to superior IQ scores should predict. Shulman et al. (1995) report that individuals on the Autism Spectrum have difficulties with tasks that necessitate internal manipulation of information.

Theory of Mind (TOM) is defined as the ability to infer mental states, including beliefs, intentions and thoughts (Perner & Wimmer, 1985). Happe (1995) describes these internalized manipulations of information as mentalizing. How "mentalizing" is related to "global coherence" and Theory of Mind is unclear. But these processes suggest an interface among auditory processing, language, cognition, and the "load" of factors present in any situation.

Dunn et al. (2002) support, with preliminary evidence, the view that clear differences exist in the sensory processing patterns of children with Asperger Syndrome when compared with non-clinical peers. Asperger Syndrome students are reported to have difficulty with auditory processing. They demonstrate poor ability to modulate their responses from one situation to another. The authors advocate for a student to receive a sensory measurement that will yield a profile that reflects the assessment of sensory processing, modulation of behavioral-emotional responses, and level of response to "sensory events". Sensory processing deficits may alter the ability to cognitively manipulate data accurately.

The observations by Frith (1991) and Frith and Happe (1994) that Asperger Syndrome children are limited in their ability to demonstrate pretend play, imagination and creativity has some support in the research literature (Craig and Cohen, 1999). This apparent restricted ability to predict future events by manipulating past experience, as part of problem solving, may be related to measures of limited creativity and Theory of Mind factors identified early in Asperger Syndrome child development (Baron-Cohen et al. 1999) (Jolliffe & Baron-Cohen, 2000).

Ehlers, et al. (1997) compared the cognitive profiles of Asperger Syndrome, Autism Disorder, and Attention Deficit Disorder students 5 to 15 years old. The Swedish version of the WISC III Kaufman Factors of Verbal Comprehension, Perceptual Organization and Freedom from Distractibility measurements were compared for forty (40) students in each group. The Asperger Syndrome and Autism Disorder groups differed in respect to "fluid" and "crystallized" cognitive ability, with the Asperger Syndrome group scoring higher in both areas. They also found that the Kaufman Factor scores accounted for more variance than WISC-III Verbal or Performance IQ scores.

De Leon et al. (1986), Courchesne et al. (1994), Schultz et al. (2000), and Morris et al. (1999) investigated brain hemisphere function associated with developmental prosopagnosia and visual-perceptual functions involved in face recognition. There is inconclusive evidence that inability to perceive emotion in facial cues is a neurocognitive dysfunction of visual-perception (Grossman, et al. 2000). The conclusion does not imply that there is no evidence of cortical neuropathology present in Asperger Syndrome. Casanova, (2002), Rourke, et al. (1983), Aman, et al. (1998).

Asperger Syndrome Profile

Barnhill (2001) provides a synthesis of research conducted by the "Asperger Syndrome Project". The Asperger Syndrome Project was designed to provide an "empirically valid profile of individuals with Asperger Syndrome" (p. 300). A series of studies is summarized to provide a description of Asperger Syndrome children and youth. The following characteristics are reported:

1. IQs similar to the general population, ranging from deficient to very superior.
2. Significantly less capable written than oral language skills.
3. Limited ability to problem solve in contrast to verbal fluency skill.
4. Measured emotional difficulties not endorsed by the Asperger Syndrome students themselves.
5. Problems with inferential comprehension.
6. Attributions that parallel a learned helplessness approach.
7. Sensory problems similar to a cognitively deficient person.

It is helpful to separate the influence of intelligence quotient from each diagnostic classification, e.g., Autism IQ quotient in the deficient range and Asperger Syndrome IQ quotient in the normal to very superior range. Barnhill (2000) omits other characteristics such as eye gaze, pragmatic language deficiencies, poor speech characteristics of prosody, volume, phrasing, grammatical structure and word stress.

The cluster of factors associated with socialization, social skill development and social reality testing are important discriminate variables associated with Asperger Syndrome. The tendency to prefer aloneness, to avoid peers in preference to adult interaction, other avoidant behaviors, and marginal independent living skills are also related to diagnosis and prognosis for Asperger Syndrome persons (Nesbitt, 2000); (Matthews, 1996); (Mawhood & Howlin, 1999); (Tantam, 2000); (Dewey, 1991); (Dyer, et al. 1996).

The inability to draw inferences, to interpret connotative meaning, and to apprehend relationships between factual knowledge and higher order thinking also need to be included as Asperger Syndrome characteristics worthy of investigation. Evidence of over and under reactivity to ordinary stimuli, and attentional shift problems are important characteristics (Courchesne et al.,1994). Level of cognitive rigidity in the presence of anxiety-producing stimuli reported anecdotally has important heurestic value in future researches.

Asperger Syndrome is a complex continuum of symptoms and these problematic symptoms of communication and language, cognition, adaptability, lack of generalization of skill, socialization and sensory processing are more evident in the interactions that are part of the daily activities in the natural environment than the testing room. The clarity of the diagnostic nosology that fits the child's environment is important. And the need to assess Asperger Syndrome persons as part of the natural daily routine is also important in order to obtain a valid assessment of their competencies.

Associated Co-morbid Conditions

The method to obtain an accurate diagnosis and treatment for an Asperger child is usually not straightforward. Asperger Syndrome is a multi-faceted disorder with subtle manifestation of deficits (Mesibov et al. 2001). The diagnostic process is further complicated by co-morbid conditions, or other secondary problematic behaviors. These may include difficulties with attention and concentration, anxious behaviors, depression, motor or vocal tics, obsessive-compulsive behaviors, noncompliant or aggressive behaviors, or learning disabilities (Klin, Volkmar & Sparrow, 2000). Behaviors associated with these conditions tend to be disruptive, and therefore become the focus of treatment and diagnosis. Before it is recognized that a youngster has Asperger Syndrome, the child may be given one or more of the following diagnostic labels: Attention-Deficit/Hyperactivity Disorder (ADHD), Depression, Anxiety Disorder, Obsessive Compulsive Disorder (OCD), Oppositional-Defiant Disorder, or Schizophrenia. In some cases the child may have a co-morbid condition, which warrants the diagnosis. In other cases, the behaviors are a manifestation of one of the many features of Asperger Syndrome, and do not meet the criteria for a second diagnosis.

Of twenty-four adolescent students at The Learning Clinic who were diagnosed with Asperger Syndrome or PDD, NOS, (using DSM-IV criteria) 54% were treated with three or more medications (R = 0-5) (mode = 3). The same group of 24 students revealed a pattern of co-morbid diagnoses: 54% were diagnosed with two or more conditions and 25% with three or more conditions (R = 0-4) (mode = 2) (DuCharme & McGrady, 2004).

Attention-Deficit/Hyperactivity Disorder

Difficulties with attention and concentration are not uncommon with Asperger Syndrome children, especially in younger children (Klin, Volkmar & Sparrow, 2000). According to Klin and Volkmar (1997) 28% of Asperger Syndrome children have a co-morbid diagnosis of Attention-Deficit/Hyperactivity Disorder. However, the Asperger Syndrome child can present with impaired attention without having Attention-Deficit/Hyperactivity Disorder. Some features of Asperger Syndrome that interfere with attention include sensory overload, and fixated attention. With sensory overload, the Asperger Syndrome child has difficulty filtering out irrelevant stimuli, and can become overloaded with sensory input. Instead of focusing attention on what is relevant, s/he is “distracted” by too much sensory input, failing to attend to what is important. For example, “Alex” has a hypersensitivity to auditory input. He was so distracted by the sound of a bumblebee buzzing around a bush 30 feet from the house, that he couldn’t stay on task to complete his chores. He repeatedly put his hands over his ears, trying to muffle the sound of the bumblebee.

With fixated attention the Asperger Syndrome child becomes intensely preoccupied and selectively focused on an object or activity. Because of this fixated attention, they fail to attend to other stimuli (verbal information or interactions) in their environment. For example, “Alex’s” teacher was reviewing plans for a class trip the next day. “Alex’s” attention was so focused on the ducks printed on his teacher’s tie that he failed to “hear” what his teacher was saying, and did not respond to the teacher’s questions.

Anxiety Disorders and Depression

Anxiety and depression are more common among older Asperger Syndrome children and adults (Klin, Volkmar & Sparrow, 2000). As Asperger Syndrome children mature, they become increasingly aware of how they differ from their peers, and the difficulty they have in social relationships. They are aware of “standards” of behavior and achievement which are difficult for them to attain. Frequently, as a result of these differences, the Asperger Syndrome child becomes the victim of peer teasing or ostracizing. In response to these very real differences, taunting, and social consequences, the Asperger Syndrome child may become depressed. Adolescent depression tends to manifest differently than in adults. Instead of expressed sadness or withdrawn behaviors, it is manifested through acting-out or an irritable demeanor.

If the Asperger Syndrome child responds with anxious behaviors, it could manifest as nail-biting, tugging at clothing, hair pulling, avoidance of school or other social situations, etc. In some cases, the anxious behaviors may meet the criteria of an anxiety disorder such as social anxiety, or school phobia. Similarly, if the depression becomes chronic and significantly interferes with daily life, it may meet the criteria for a mood disorder. In a study by Klin et al. 2000, fifteen percent of Asperger Syndrome children had a co-existing mood disorder.

Distinguishing between anxious and depressed behaviors, which meet the criteria for a disorder is not easy, and professional consultation is recommended. Generally, if the anxious or depressed behaviors are short-lasting, or are a normal response to an event, then the anxious or depressed behaviors should remit. If they are chronic, and significantly interfere with daily life, professional treatment may be needed.

Obsessive-Compulsive Disorder

Although Obsessive Compulsive Disorder does occur in some individuals with Asperger Syndrome, (nineteen percent according to Klin et al. 2000), some features of Asperger Syndrome can be mistaken for obsessive compulsive disorder: cognitive rigidity, rigid adherence to routines and schedules, and a restricted range of interests. For example, it is common for Asperger Syndrome children and adults to have a consuming interest in a specific limited topic, e.g., trains, elevators, dinosaurs, presidents of the United States, etc. They typically develop extensive knowledge about their specific area of interest. What distinguishes behaviors associated with these interests from Obsessive Compulsive Disorder, is that the Asperger Syndrome individual does not feel compelled to read about “trains” or “ride a train” as a means of reducing feelings of anxiety – they simply find pleasure in pursuing their area of interest. For example, “Alex” has a consuming interest in trains. He collects books, magazines, catalogues and videos about trains, train schedules, model trains, knows the history of trains, how they are built, and frequently rides trains. However, he is able to go through his day without train-related activities interfering with his daily routines. Given the opportunity, however, to read a book, or talk about something he likes, he will inevitably discuss/read about trains.

Another feature of the Asperger Syndrome child’s restricted range of interests is that they are ego-syntonic, i.e., the Asperger Syndrome youngster does not see anything wrong with engaging in the absorbing interest. An Obsessive Compulsive Disorder youngster is generally bothered by the obsessive thoughts and compulsive behaviors, and experiences them as intrusive and disruptive to his/her life, and is a source of anxiety. Not so for the Asperger Syndrome child.

Oppositional-Defiant Disorder

Asperger Syndrome children can be difficult to manage, and exhibit noncompliant behaviors. However, the reasons for the apparent noncompliance are different. An important difference between an Asperger Syndrome child and an oppositional-defiant child is volition. While the oppositional-defiant child will planfully disobey the “rules”, the Asperger Syndrome child will generally make an effort to follow the rules, as he understands them. However, his understanding of the rule may be impaired either because of a miscommunication (comprehension or language pragmatics), sensory overload, misreading of contextual (nonverbal) cues, inattention, or because he acted impulsively. Additionally, when an Asperger Syndrome child learns a rule in one environment, the behavior will not generalize to a new setting. In the new setting the contextual cues are different, and the Asperger Syndrome child will perceive the similar setting/situation as entirely different.

Schizophrenia

Many aspects of Asperger Syndrome can be confused with psychotic behavior. An untreated Asperger Syndrome child can present as a solitary individual, uninterested in social interaction and intensely preoccupied with internal thoughts. Poor language pragmatic skills can contribute to a child verbalizing tangential thoughts that are loosely related to ongoing discussions. For example, when ”Alex” was first enrolled in a therapeutic school, he had a history of many years of engaging in solitary activities. His parents reported that his behavior had become increasing unmanageable, and it became easier to allow him to entertain himself with his solitary activities, rather than endure his acting out behaviors when they tried to force him to interact with other family members. He spent many hours each day watching

television, playing computer games, or using other electronic game equipment. When first confronted with new routines and adult interactions from which he could not escape, Alex retreated into his private mental world of television and computer game characters. He expressed fear of one of these characters, and often imagined "seeing" the character in his room at night. He was provisionally diagnosed with a psychotic disorder. But as "Alex" adapted to his new environment and routines, learned age-appropriate social skills, and improved his pragmatic language skills, he became more interactive with others, and there were no more occurrences of his "psychotic" behaviors.

Individual Factors

Children and youth who demonstrate significant and pervasive developmental delays are at risk of school failure, unemployment and increase in psychological and psychiatric symptoms of a debilitating nature over time.

Asperger Syndrome individuals' college dropout rates and rates of failed employment are high. These high rates are due not to lack of intellectual capability or the inability to understand job performance and competency requirements. Failures are associated with a lack of social skill, pragmatic language skill, failed attendance and poor self- advocacy skills. Psychological and psychiatric symptoms increase over time and the corresponding medication therapy of increased levels of neuroleptic and other psychological medications tends to interfere with alertness, responsiveness, and other cognitive functions.

Children and youth with an Asperger Syndrome diagnosis are within the normal to gifted range of intelligence. And children and youth with a diagnosis of Asperger Syndrome are the most prevalent group of individuals demonstrating developmental delay. The review of the almost four hundred researches, articles and books demonstrate a high degree of risk in all of the fifteen developmental indices identified (Chart 3).

A primary contributing factor to risk for students on the Autistic spectrum is failure to clearly define diagnostic criteria, appropriate treatment cannot be applied, and prognosis is poor.

The following chart (chart 3) defines 15 developmental indices to identify areas of strengths and deficits for Asperger and other Pervasive Developmental Disorder students.

The conceptualization of Pervasive Developmental Disorder is a view of performance over time and in consideration of multi causal factors for delayed or impaired development. Each individual developmental index requires a defined criterion that illustrates a threshold index for impairment or delay.

Conceptualization of PDD
Assessment For Threshold of Impairment/Competence

1. IQ Level
Verbal Performance Score

Full Scale Score

Discrepancy Profile:
Verbal/Performance
(Sub Test) Scatter

2. Developmental Attention/ Perception
Discriminant Stimulus:
Arousal-Recognition
Identification-Classification
Mediation-Utilization
Retention:
Short Term Memory (STM)
Long Term Memory (LTM)

3. Sensory Sensitivity:
Kinesthetic
Auditory
Olfactory
Light

4. Visual-Perceptual Skill

5. Developmental Level
Spatial Perception

6. Motor Skill:
Fine-Gross Motor Ability
Coordination
Lateral Dominance

7. Developmental Language:
Verbal – NV
Receptive Ability
Expressive Ability
Pragmatics

8. Social Skill: Assessment by Settings:
Home
School
Community

9. Cognitive Skill:
Executive Function
Bloom Levels
Imagination & Creativity
Flexibility
Cognitive Load Limits

10. Academic Readiness:
Achievement Grade Equivalent
Level of student-role Behaviors

11. Independent Living Skills:
Skill Survey

12. Moral Judgment Behavior:
L. Kochberg Model of levels
J. Rest Model of Measurement

13. Medical Health
Mental and Physical History

14. Civic Role Performance
Knowledge and Application Level

15. Affective Developmental Level influence on perception and comprehension and self-regulation

If the fifteen developmental indices are chosen for assessment, thorough measurements of developmental function will provide a baseline of an individual's development. The dimensions of the developmental indices may be presented along a horizontal and vertical axis. Intelligence is one index. The intelligence quotient may be measured by the scores derived from the WISC-IV on "verbal" and "performance" competencies indicated by the comparison of individual scores to normative data. The WISC-IV scores reflect an individual's relative competencies in two areas associated with learning potential. Cognitive functioning is inferred from the IQ score. Certainly the integration and interaction between levels of cognitive development within the measurement of intelligence, for example, is important as intelligence influences performance and competence in other developmental areas. Intelligence may not correlate with levels of moral judgment or levels of independent living skill or many other important areas.

The following is a review of available assessment tools for nine skill areas: Attention and Mental Control, Intellectual Functioning, Visual-Spatial and Motor Skills, Auditory and Visual Perception and Memory and Social Skills.

Attention and Mental Control

The focus of the following task examples is to assess brief passive attention, short-term concentration skills, inhibition of routinized information, the ability to visualize and manipulate information in working memory, and the ability shift cognition and behavior as task demands change. These tasks include: reciting the alphabet, days of the week (forward and backwards), and months of the year (forward and backwards) (Bender, 1979), Serial Threes (counting forwards (from 1) and backwards (from 100) by threes, and spelling selected words forward and backwards, Visual Continuous Performance task (Mesulam, 1985), Trail Making Test (Reitan, 1958), Verbal Fluency (FAS), and Wisconsin Card Sorting Test (Grant & Berg, 1948).

Intellectual Functioning

IQ assessment not only provides an overall assessment of intellectual skills, but also differential assessment of verbal versus performance skills, processing speed, working memory. The Wechsler Intelligence Scale for Children, IV (Wechsler, 2003), or the Wechsler Adult Intelligence Scale, III (Wechsler, 1997), provides a comprehensive assessment of intellectual functioning. Analysis of the subtests provides information about other areas that are relevant to a diagnosis of Asperger Syndrome: knowledge of conventional social customs and social judgment, visual-motor skills versus visual problem-solving without a motor component, executive functions (e.g., organizing, planning, sequencing, attention), and visual and auditory memory.

Visual-Spatial and Motor Skills

These tests assess the brain's ability to process and integrate visual and motor information (e.g., eye-hand coordination), visual reasoning without a motor component, the ability to organize and execute a drawing strategy, and spatial organization. These tests include: IQ subtests (Block Design, Object Assembly, and Matrix Reasoning), Beery-Buktenica Developmental Test of Visual Motor Integration (Beery, 1989), Rey Osterrieth Complex Figure (Rey, 1941; Osterrieth, 1944; Meyers & Meyers, 1955), Benton Judgment of Line Orientation (Benton, Hannay, & Varnay, 1975), Rey Tangled Lines (Rey, 1964; Senior, Kelly & Salzman, 1999), Hooper Visual Organization Test (Hooper, 1958), and Draw a Clock (Goodglass & Kaplan, 1972).

Auditory and Visual Perception and Memory

These tests assess the brain's ability to process auditory information (language and non-language domains such as music) and visual information (written versus pictorial/abstract), and the ability to encode and recall it. The Wechsler Memory Scale, Third Edition (Wechsler, 1997) includes multiple subtests which provide a comprehensive assessment of auditory perception and memory, as well as visual perception and memory. The ability to "hear" the prosodic quality of language is impaired in Asperger Syndrome individuals. The Seashore Rhythms Test (Halstead, 1947) assesses non-language auditory perception skills. In this test the individual must discriminate between pairs of musical beats, some of which are the same and others, which are different. .

Social Skill Assessment

Deficits in social skills are one of the salient characteristics of Asperger Syndrome individuals. The Social Skills Rating Scale (Gresham & Elliott, 1990) has three forms (self, parent, and teacher) and assesses social skills in a variety of categories: cooperation, assertion, empathy, self-control, externalizing and internalizing behaviors, and academic competence. A comparison of the responses from student, parent and teacher provides an overview of the student's self-assessment skills.

We need to improve the diagnostic clarity of the criteria used for Asperger Syndrome. We have a working knowledge for the basis for improvement. Level of language skill and prosody, social adaptability, social pragmatic language, cognition, sensory motor integration and maladaptive behavior are categorical aspects of Asperger Syndrome. These categories of behavior are most often referred to as component characteristics of a complete picture of the functioning of a person with an Asperger Syndrome diagnosis.

The limitations of the diagnostic systems in current use complicate the process used to identify those in need of specialized services. It remains important to address the symptoms currently presented by individuals in need of services. And hopefully, the revision of the DSM-IV in 2010 will result in an improved system for the depiction of a person with Asperger Syndrome.

If psychiatric conditions are left undiagnosed and untreated the prognosis for Asperger Syndrome individuals is poor over the course of their lifespan (see Chart 2). Children and young adults with the diagnosis of Asperger Syndrome, for example, are at a higher risk of demonstrating co-morbid psychiatric conditions. The most frequently associated conditions are attention deficit disorder, depression, anxiety disorder and oppositional defiant disorder. These conditions require a multi-modal approach to treatment, e.g., cognitive behavior therapy, psycho-educational interventions, medication therapy.

Children referred for psychiatric illness corresponds to a rate of suicidal behavior of 63.0 per 100,000. The ratio of boys to girls is 53:73. Most girls are 13-14 years of age and the boys, 8-12 years. The population of children in a study by Ugeskr and Laegev (2002) suffered from psychosis, Pervasive Developmental Disorder, Attention-Deficit Disorder and Mixed Disorder of Conduct and Emotion. It is reported that individuals with an Asperger Syndrome diagnosis may follow the same trend. No formal research is reported, however, on suicide rates among Pervasive Developmental Disorder or Asperger Syndrome individuals. If left untreated and without early multi-modal intervention such as correct diagnosis, psycho-educational intervention, cognitive behavior therapy, and medication therapy, individuals become increasingly resistant to treatment. Asperger Syndrome individuals are observed to incorporate symptoms of dysfunctional behavior into their performance and these dysfunctional behaviors become ego-syntonic. The Asperger Syndrome individual perceives his behavior as “normal” and not in need of change. Increased attention, focus and treatment attempts at intervention often result in greater the level of rigidity and resistance on the part of the AS individual. Pre-school and elementary age children are more maliable and responsive to treatment. This contrasts with adolescent individuals who demonstrate behavior patterns and preferences that are more resistant to modification. Adolescents are less able and willing to perceive their own patterns of behavior and specific symptoms as problematic and in need of change.

Social and Community Factors

A “syndrome” is defined as a group of signs and symptoms that occur together **(Merriam-Webster, 1990)**. The term Asperger’s “Disorder” was changed to Asperger “Syndrome” to more accurately reflect the fact that it is characterized by a group of symptoms on a continuum. Many of these symptoms require specific interventions. Among the special services that may be needed are: social skills training, special education, occupational therapy, physical therapy, speech and language therapy, psychiatric and psychological interventions, neurological and neuropsychological assessments, and social and employment opportunities. The resiliency of children is enhanced when these resources are readily available through social networks and community services and preplanned transition services are provided after high school graduation.

Social Factors and Peer Groups

Social skill training is essential for Asperger Syndrome and Pervasive Developmental Disorder children. However, the skills that are learned in a therapeutic setting must also be put into practice in daily life. The goal is for them to be able to self-initiate age-appropriate social skills in non-therapeutic settings. Asperger and Pervasive Developmental Disorder youth learn best when there is the opportunity for repeated practice in multiple settings. The concept of exposure to environmental social interaction as necessary for the development of social skills is well understood (Bandura, A., 1969); (Tharpe & Wetzel, 1969).

Therefore, the availability of a peer group who can encourage, support, and role-model appropriate social skills – and provide the opportunity for social interaction – facilitates the development of these skills. "Jeremy's" experience illustrates the power of a supportive peer group. Jeremy was fifteen when his family enrolled him at a residential school. He was an intelligent, kind-hearted young man, but had no friends. His prior school experiences became increasingly negative as he was not only excluded from social interactions but often ridiculed for his "odd" behaviors and lack of social skills. Over time, he became depressed, increasingly isolative, and eventually refused to go to school.

Upon arrival at the residential school, Jeremy was shy, and lacked age-appropriate social skills. However, he found that his peers at his residential house and at school were accepting and supportive. He learned that most of them had similar negative experiences of being targeted and ostracized. Along with some of his new peers, Jeremy participated in social skills training where he learned how to read nonverbal communication, participated in role-plays of social skills, and learned how to match the correct social behavior with the right social situation. Jeremy and his peers had to "practice" their social skills in many settings: school, residential house, community, and home. With the support and encouragement of his peers, Jeremy joined in social activities and his self-confidence, as well as his social skills, gradually increased. His depression abated, and for the first time in his life, Jeremy obtained a community part-time job while completing his high school education. Today, his outlook is optimistic, he has a circle of friends, and he is proud of the independent living skills which he is developing.

Social "Clubs"

One of the defining traits of Asperger and Pervasive Developmental Disorder children is their restricted areas of interest, topics in which they have an intense interest, and about which they tend to accumulate extensive knowledge. Teachers have learned that these children will become very attentive and motivated to learn when their area of special interest is incorporated into the concept being taught. Similarly, their area of special interest can be used to compete with the tendency to isolate: social clubs/activities in their area of special interest. For example, "Alan" had an intense interest in professional wrestling. He talked about wrestling with anyone who would listen, read magazines about the history of wrestling, acquired wrestling memorabilia, watched TV wrestling program, and attended wrestling events whenever there was an opportunity. Through his employment, Alan met a group of peers who shared his interest in professional wrestling, and he began getting together with them to watch TV wrestling programs together. What had been a solitary activity was now a social activity.

Another student, "Karen" was particularly interested in health and nutrition, and would talk incessantly about these topics with anyone who would listen. She took college courses in biology and nutrition, and developed study groups with peers. Eventually, Karen's interest led her to become an EMT, and through her work at her local fire department, she has established friendships and social activities.

Community Resources

Children in general, and developmentally disabled children in particular, thrive and are resilient when their communities are able to provide the services they need. As mentioned above, the community-based services that may be needed include: special education, occupational therapy, physical therapy, speech and language therapy, psychiatric and psychological interventions, neurological and neuropsychological assessments, and social skill training, apprenticeship and employment opportunities and independent living skills and transition plans for post high school years.

Special Education

Special education schools are better able to provide for the educational needs of developmentally handicapped children. Academic modifications which enhance learning for Asperger Syndrome and other Pervasive Developmental Disorder students include: multi-sensory learning, adaptations for dysgraphia and visual-motor processing problems, required extra processing time, self-paced program, frequent repetitions and cues, hands-on learning experiences for the concrete learner, distraction-free environments, structured and self-contained classrooms that minimize transitions, and modifications for sensory hypersensitivities, receptive-expressive language deficits, and other learning disabilities.

Because of impaired nonverbal skills, and receptive/expressive language deficits, Asperger Syndrome and other Pervasive Developmental Disorder children learn better through multi-sensory approaches to learning. Special education teachers are skilled at using teaching techniques that involve use of multiple senses. One manifestation of visual-motor integration difficulties is poor handwriting (dysgraphia) necessitating a way of expressing themselves by other means than paper and pencil, such as computer keyboarding, or video and audio recording. These are common teaching modifications available at special education schools. Other teaching modifications available at special education schools include providing one-on-one instruction that incorporates the need for extra processing time, simplified (1-2 steps at a time) instruction, repetitive hands-on practice for the concrete learner, backwards chaining to address global coherence deficits, self-contained classrooms to minimize distractions and transitions.

The degree to which these special education services are provided for Asperger Syndrome and Pervasive Developmental Disorder youngsters contributes to or detracts from their resiliency.

Professionals knowledgeable in diagnosing and treating Asperger Syndrome and Pervasive Developmental Disorder, NOS

Some students may also require occupational or physical therapy to improve visual-motor integration skills, and to minimize sensory hypo/hypersensitivities and self-stimulating behaviors. Speech and language therapists may be needed to remediate expressive and receptive language deficits. Psychologists, neuropsychologists, and psychiatrists are essential to diagnose and treat psychiatric and behavioral difficulties. This requires an understanding of the neurobiology of the Asperger/Pervasive Developmental Disorder brain, and the resulting individual patterns of strengths and weaknesses, to develop effective treatment interventions.

Co-morbidity is common in Asperger Syndrome and Pervasive Developmental Delay children, and often interferes with accurate diagnosis. Children are accurately diagnosed at an earlier age when they are seen by medical and psychiatric professionals who are familiar with Pervasive Developmental Disorders. The resiliency of these children is enhanced when they receive an early, accurate diagnosis because they begin to receive needed services at an earlier age.

Employment

In general, Asperger Syndrome and Pervasive Developmental Disorder children have average to high-average intelligence and develop employable skills. However, because of their social skill deficits, they often “fail” the employment interview. Employers who are unfamiliar with the developmentally disabled sometimes interpret their poor social skills as lack of interest in the job, low intelligence, or rudeness.

“Alan’s” experience typifies the frustrating job search experience of many Asperger adolescents. Alan was bright, did well in school and was eager to get a part-time job. His “obsession” was baseball, and he wanted to save up to attend a baseball camp during summer vacation. However, his poor social skills, including tendency to avoid eye contact, and poor communication skills made it difficult for him to interview well. During interviews he spoke in a low volume, looked down or away from the interviewer, responded to questions with short answers, and was fidgety. Consequently, employers “read” his behavior as lack of interest in the job, and he was repeatedly rejected.

However, Alan was persistent, and continued to turn in job applications. One day he got a call for a job interview at a local fast food restaurant. Alan put on his dress pants and shirt, and showed up early for his interview. When he arrived he asked an employee where he should go for his meeting. She was impatient, interrupted Alan and hurriedly told him to enter an adjacent room where the meeting was getting underway. Alan was anxious and confused, but did not know how to ask for clarification. He entered the room, only to find it filled with people. He tried to ask about his interview, but was told just to sit down with the others and listen. So, Alan complied. It was an orientation meeting for new employees and they had mistakenly assumed Alan was there for the orientation. Before he left, he was given a uniform and training schedule to begin work – at his new job! Alan did well performing his duties – but would never had been hired if he had to "pass" the job interview first.

Educating employers about the deficits – and strengths – of the developmentally disabled helps to overcome interview misunderstandings, and to provide an appropriate fit between employment opportunities and employee skills. Increasing employment opportunities for Asperger Syndrome and Pervasive Developmental Disorder youth increases the probability that they will be able to enter the job market, and work towards financial independence. Sufficient planning of transition programs that include invivo rehearsal, training and monitoring of employment skills is critically important to the Asperger Syndrome or PDD, NOS client.

Family Factors Influencing Risk and Resiliency

There is little research specific to risk and resiliency in families of Asperger Syndrome individuals. There is anecdotal evidence that Asperger Syndrome is linked to male family members. The evidence suggests that male Asperger Syndrome characteristics are genetically linked to male children and their fathers or paternal grandfathers. There are more male than female individuals identified with Asperger Syndrome (ratio 8:1). And, if one child is born with characteristics of autistic symptoms, then there is a higher probability of siblings being diagnosed as demonstrating symptoms on the Autism spectrum.

There are genetic, hereditary risk factors. Genetic counseling is important to be made available for families identified at risk. Family history, DNA profile, and genetic markers may provide help to families as is provided by Fragile X data to parents of children with the DNA protein deficiency associated with retardation.

The family setting is the most influential factor in socializing and educating a child. Therefore, the composition and "health" of the family exerts significant influence on the degree of success of these efforts at intervention.

Family factors which provide a child with resiliency include: family history of mental health, effective behavior management skills, parental support of treatment interventions, and ability to advocate for needed services. The degree to which any of these factors are diminished or absent increases the risk of failure to successfully socialize and educate a child.

Mental Health of the Family

Children who present with multiple diagnoses require more intensive treatment interventions, and take longer to demonstrate progress. Because the risk of co-morbidity increases with a family history of psychiatric illness, family mental health is a significant indicator of resiliency.

For example, "Ann" and "Bob" entered residential treatment at the age of 13 years. Ann was diagnosed with Asperger Syndrome. One of Ann's parents has Asperger "traits" but no other psychiatric diagnosis. Bob carried a diagnosis of Asperger Syndrome, Bipolar II Mood Disorder, Oppositional Defiant Disorder, and several Learning Disabilities. His family history is positive for mood disorder and autistic "traits."

Although initially depressed and anxious, Ann did not qualify for a diagnosis of a mood or anxiety disorder. These symptoms were in response to a prior non-supportive academic environment, and increasing awareness of the social gap between herself and her classmates. Ann was bright, cooperative, and responded well to the structured academic and residential setting. Her mood stabilized and she became less anxious. In addition to weekly individual therapy, Ann participated in several social skill groups each week. The small classroom setting provided Ann with the academic support she needed, and her academic progress contributed to her increasing sense of competency. She began to apply the social skills she was learning, and developed friendships. Currently, Ann is not on any medication, she graduated from high school, attended a small 2-year college, and then transferred to a 4-year university, with plans to attend graduate school. The prognosis for Ann is good, as she will be able to live independently, continue to develop a social life, and be financially independent.

Bob was also bright, and participated in weekly individual therapy and multiple social skill groups each week. However, Bob was moody and noncompliant. Attempts to elicit Bob's participation in the residential routines and classroom setting were met with resistance, defiance and sometimes aggression. Bob required intensive one-to-one intervention for the first nine months in residential treatment. He was gradually stepped into the classroom over a period of months, with many setbacks. Once in the classroom, he continued to need one-to-one support and required many "sensory integration breaks" because he would become cognitively overloaded by the multiple task demands. Bob did not develop supportive relationships with his peers because he tended to alienate them with his moodiness and negativity. Overall, Bob's progress was slow. Medications for his mood disorder required frequent adjustments in type and dosage. Other medications were prescribed for his aggression, rigidity, and poor attention and concentration. Bob is now a young adult, graduated from high school late, and is still struggling to master independent living skills. He has not been able to sustain employment in the community, and does not plan to attend college. Bob has learned to peacefully co-exist with his housemates, but does not have any real friends. The prognosis for Bob is guarded, as he will probably require supportive living for the rest of his life.

Parental Advocacy, Support of Treatment Interventions, and Behavior Management Skills

The family system and its functional pattern may illustrate tolerance and adaptation to the symptoms of the Asperger Syndrome family member. For example, if the father of the Asperger Syndrome child is also diagnosed with Asperger Syndrome, it may increase the family's resistance to treatment and obstruct the identification of the child as in need of special education, medication, and psychological treatment. Father most probably will not value social-skill training, and may not perceive the clinical aspects of the child's behavior. Understanding the family system and family patterns of experience and interaction are important to effective treatment of the Asperger Syndrome child.

The level of family dysfunction is related to stress associated with failure to obtain an early diagnosis, misdiagnosis, school and peer problems, sibling rejection of the Asperger Syndrome child, and lack of treatment options.

The age at which parents become aware that their son/daughter is not meeting developmental milestones varies. When a child is correctly identified as having developmental difficulties, it is reported to take additional years for a correct diagnosis. Many Asperger Syndrome children become identified after they enter school because of the difficulty they have meeting social and academic requirements and diagnostic services are made available under IDEA standards. Then a family may struggle to locate affordable appropriate treatment. The longer treatment is delayed it tends to be more expensive, less effective, and the Asperger Syndrome child will require a more restrictive treatment setting. Treatment delay also increases the likelihood that the child will develop more severe behavior problems, and psychiatric problems (mood and anxiety disorders) that are secondary to the learning difficulties they encounter. If untreated, the needs of the Asperger Syndrome child (education, medical treatment, and future supportive living) may become increasingly the sole responsibility of the family.

If parents identify their child's difficulties early on, are able to advocate for needed services early in the child's life, and are supportive of the recommended interventions, the prognosis is better. The following two case studies typify children who receive services early in life, and those that don't.

"Marjorie" was diagnosed with Childhood Disintegrative Disorder when she was in elementary school. Her parents were strong advocates for obtaining services for Marjorie, and she was eventually placed in a therapeutic residential school at age 12 years. Prior to arriving at the residential school, Marjorie had been refusing to go to school, had become electively mute, developed many odd mannerisms, and her social skills were very immature. In the intensive therapeutic residential program, it was discovered that Marjorie had simply stopped talking because her family members always answered for her. Her diagnosis was changed to Pervasive Developmental Disorder, NOS. Typical of Pervasive Developmental Disorder children, Marjorie required extra time to process information before answering. This was mistakenly interpreted as an inability to respond. Within a short time, Marjorie was communicating her own wants and needs, and school attendance was regular. Her parents were supportive of the interventions and expectations of Marjorie, and learned to use the same behavioral program with her during home visits. Her social skills gradually improved, as well as the odd mannerisms. Before Marjorie graduated from high school, she was living in a community-based apartment, maintaining paid part-time employment, and taking martial arts classes. After graduation she moved back to her hometown, but into her own apartment. She obtained paid employment, and began taking dance classes.

"Dave" lived with his parents who accepted his lack of social skills and odd behaviors as "typical teenage" behaviors. His father was an undiagnosed Asperger Syndrome adult, who saw nothing wrong with Dave's obsession with computers, or with his use of the internet as his sole social outlet. Because Dave's father shared many of his son's traits, he failed to recognize his son's behavior as atypical, and did not advocate for clinical interventions. Dave's parents reasoned that their son was very bright, and would someday make a living with his vast knowledge of computers. When he had difficulty in school completing assignments and getting along with peers, they determined it was the fault of the school.

His parents decided to transfer him to a private school where he would receive the "higher level of education which he needed" and be around bright students like himself. However, Dave soon began to have the same difficulties in his new school, and was so paralyzed by his anxiety that he eventually refused to go to school. At home, he isolated in his room, and was on his computer late into the night.

At age 17 years, Dave was referred to a therapeutic residential school. Upon arrival, Dave was found to be severely lacking in social skills, cognitively and behaviorally rigid with aggressive tendencies. His restricted area of interest was computers and he was resistant to the program expectation that he engage in social interactions with his peers. He complained that he was being denied access to his computer "social life." Rather than join in activities, Dave isolated himself. His insistence to obtain access to his "internet social life" also interfered with completion of has academic work. Frequently, Dave used his computer expertise to access restricted websites. In school he was uncooperative, irritable and argumentative and alienated his peers. Dave frequently called his parents to complain about his lack of computer access. As in the past, his parents allied with Dave, externalized blame, and did not support the computer limitation, nor the social interaction expectations with peers. They reasoned that he should have computer access because that was his social life. Before the school year was over, Dave returned home, unable to adjust to the requirements of the residential school.

The primary difference between "Marjorie" and "Dave" is the age at which they were diagnosed and referred for treatment. Obstructing Dave's early diagnosis and referral for treatment was the parental shared "traits" and subsequent failure to recognize Dave's behavior as atypical. Because schools seldom take the lead in advocating for additional services for students, the ability and willingness of parents to advocate for their children determines whether or not a child will receives needed services.

Obtaining educational and clinical services is only the first step. Parents must also support the treatment interventions. Asperger Syndrome and Pervasive Developmental Disorder students are resistant to change in general, and are therefore uncooperative with treatment interventions that are focused on changing their behavior. Students who are placed in residential schools generally attempt to make parents feel guilty for "sending them away." When parents respond to these feelings of guilt by allying with their children against behavioral expectations and change, progress is obstructed. It is critical, therefore, that parents commit to following through on supporting/enforcing recommended behavioral interventions so that new skills are developed to replace old maladaptive behaviors.

Evidenced-Based Treatment Interventions

Social Skills

The literature provides little information about specific treatment interventions for Asperger Syndrome children. However, social skills training is generally accepted as an appropriate treatment for these children (Mesibov et al, 2001; Klin et al, 2000; DuCharme & McGrady, 2003). For students enrolled at The Learning Clinic (a private residential school in NE CT), a treatment intervention plan begins with an analysis of pragmatic skills strengths and weaknesses, and an Adult Mentor is used to facilitate these skills with peers. An example of a treatment plan for integrating pragmatic language and social skills is listed below.

Skill Building Strategies

1. Provide Adult Mentor to:
    a. *interpret* social situations -- What behavior is being asked for? What is the appropriate verbal or behavioral response to this particular situation?
    b. *role model* the appropriate verbal or behavioral response

2. Role model perspective-taking
    Interpret for student the other person's intent, feelings, etc.

3. Role model the following:
    a. *entry* and *exit* statements of social communication
    b. competitive vs. aggressive behaviors
    c. assertive vs. rude statements/behaviors
    c. assertive vs. threatening statements/behaviors

4. Provide opportunity for student to practice the following. Initially with Adult Mentor; then with peers (one at a time, then small groups):
    a. *entry* and *exit* statements of social communication
    b. voice modulation
    c. competitive vs. aggressive behaviors
    d. assertive/polite vs. rude statements/behaviors
    d. assertive vs. threatening statements/behaviors

5. Videotape role-playing scenarios for all of the above, and provide video feedback.

6. Videotape role-playing of common social dilemmas, and provide video feedback.

7. Provide opportunity for practice in "real life" settings, and provide feedback

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The importance of practicing social skills in real life situations is understood (Bandura, A., 1969; Tharpe and Wetzel, 1969) as necessary for the development of social skills. Exposure to environmental social interaction enhances the learning of these skills.

Transition and Independent Living Skills Training

Twenty-four years of experience with children at The Learning Clinic revealed that students required a graduated, planful withdrawal of structure and supervision to facilitate maintenance of skills after transition to post secondary education, employment, or home. Asperger Syndrome students in particular, require a period of training in transitional skills and independent living skills. As structure and supervision are gradually reduced, students are increasingly involved in the community through employment, community college classes, driving, use of community resources, and establishing community social contacts.

Students receive instruction in the following areas, and are required to demonstrate application of skills: housing, nutrition, money management, transportation, leisure, legal awareness, health, time management, personal safety, personal presentation, community resources, community service/volunteering, career planning, employment, post secondary education, and healthy relationships.

Student progress is tracked by The Learning Clinic Transition and Independent Living Skills assessment form. The assessment form is completed by the student, and the teacher. Analysis of results help to identify overall level of skill attained, as well as individual areas requiring further instruction, and increases in skill level. Although students tended to rate themselves higher than the teachers, the results indicate an overall steady increase in skill level.

The Learning Clinic Transition and Independent Living Assessment was administered to a group of students participating in the TLC Transition program, and to a group of comparison TLC students, not involved in the Transition program. Students and teachers completed the survey at one month, two months, three months, and at five months after start of the Transition program. The following tables summarize and compare the student and teacher data from time 1 and time 4:

Transition Program Independent Living Skills Assessment T1 - T4

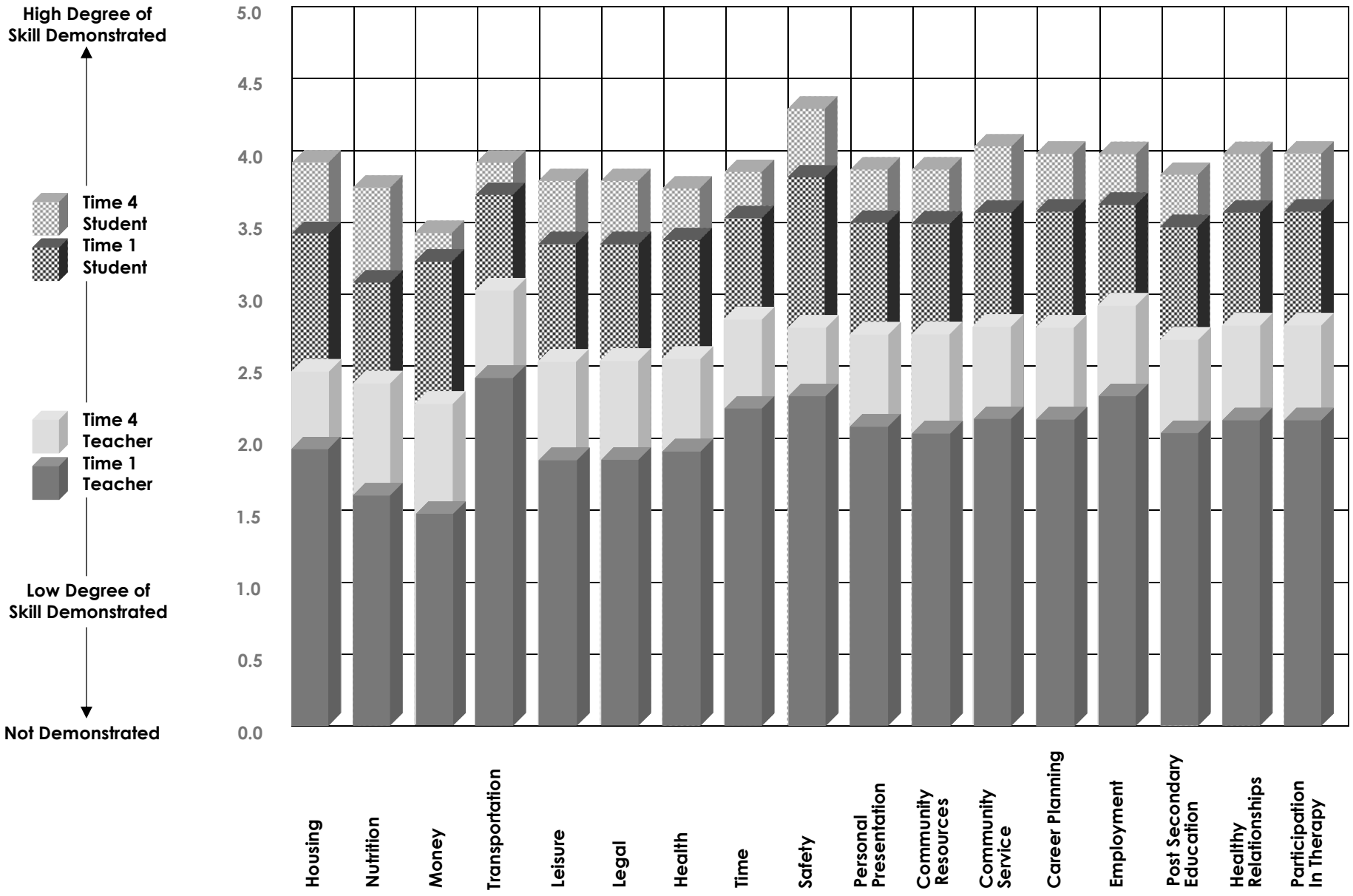
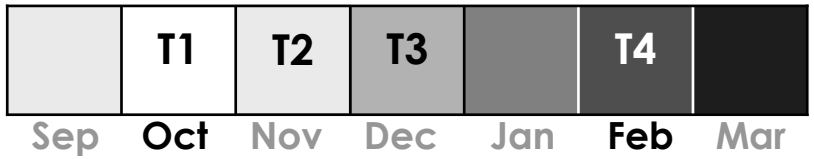


Chart 4: Compares transition student self-ratings and teacher ratings at time 1 and at time 4. Student self-ratings were consistently higher than teacher ratings at both intervals. Graphs show a trend of increased skill level from time 1 to time 4.

Transition and Comparison Students Independent Living Skill Assessment T1 - T4

Time Line for Data Collection



Skills Showing Significant Improvement by Transition vs. Comparison Students at T-4

Skills Showing no Significant Improvement by Transition vs. Comparison Students at T-4

Meal Planning & Preparation

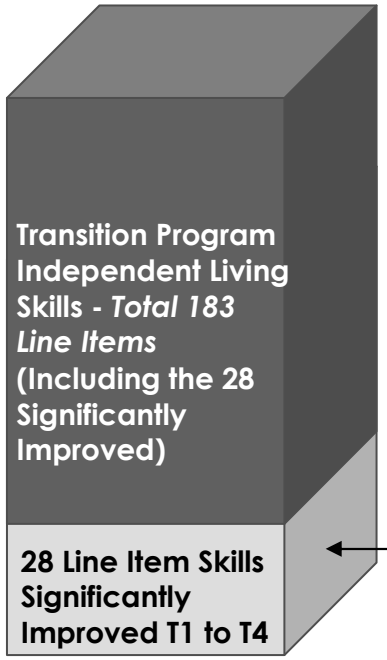
Time -1

Housing Acquisitions & Leases
Home Management
Meal Planning & Preparation
Dining
Clean Up & Food Storage
Budgeting & Taxes
Banking & Credit
Consuming
Transportation
Leisure
Legal Awareness
Health
Time Management
Maintain Personal Safety in House
Maintain Personal Safety in Community
Safety During Dating Relationships
Personal Presentation
Community Resources
Community Service
Career Planning
Employment
Post-Secondary Education
Healthy Relationships

Time - 4

Chart 5: Illustrates the relationship between the teacher ratings for the TLC transition students and non-transition students at time 1 and at time 4. At time 1, compared to the non-transition students, the TLC transition students had a significantly higher level of skill in one content area: Meal Planning & Preparation. At time 4, after 5 months of participation in the TLC transition program, compared to the non-transition students, the TLC transition students showed significantly higher level of skill in 17 of 23 content areas. Between subjects ANOVA compared teacher rated mean scores for non-transition and transition students ($p < 0.05$).

Transition Program Independent Living Skills

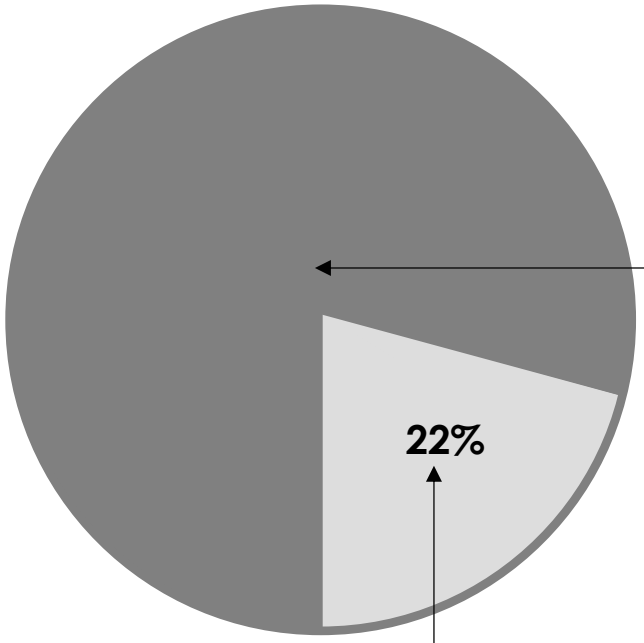


T1- Oct 03 / T4 - Feb 04

Search for Apartment / Other Housing
Read / Understand Lease Agreement
Analyze / Understand Pros & Cons of Shared Living
Know Legal Rights & Responsibilities of Landlord & Tenant
Understand the Four Basic Food Groups
Read Pay Stub
Track Expenses for One Month
Develop a Routine for Paying Monthly Expenses
Maintain a Spending Plan for One Month
Purchase a Money Order
Understand the Different Forms of Credit
Compare the Pros & Cons of "Renting to Own"
Comparison Shop for Apartment Items & Furnishings
Understand Basic Consumer Rights
Understand the Costs of Car Ownership
Identify Strategies to Control Stress
Lock Doors in Home
Safely Use Pubic Transportation
Define Sexual Abstinence
Develop Effective Strategies for Budgeting & Shopping
Know How Body Language affects Perceptions of Others
Search for Employment in the Community
Understand Worker's Compensation Procedures
Understand Laws re: Sexual Harassment in the Workplace
Analyze Prerequisites for Training & Education (ie SAT, etc.)
Research Colleges/Tech Schools for avail. Programs/Train'g
Plan Time Line & What will be Needed for School

Chart 6: For the TLC transition students, Chart 6 illustrates teacher ratings for the number of line items that were significantly improved from time1 to time 4. Out of 183 line items, skill level on 28 items was significantly improved after 5 months in the TLC transition program. Correlated groups t-test compared teacher reported mean scores for line items at time 1 and time 4 ($p < 0.05$).

Transition Program Independent Living Skills - Areas of Significant Progress



Housing Acquisitions & Leases
Meal Planning & Preparation
Dining
Clean Up & Food Storage
Consuming
Transportation
Legal Awareness
Health
Time Management
Maintain Personal Safety in House
Maintain Personal Safety In Community
Safety During Dating Relationships
Community Resources
Community Service
Career Planning
Employment
Post-Secondary Education
Healthy Relationships

% of Skills (5 of 23) Significantly Increased from T1 – T4

Home Management
Budgeting & Taxes
Banking & Credit
Leisure Personal Presentation

Chart 7: For the TLC transition students, Chart 7 illustrates teacher ratings for the number of content areas that were significantly improved from time 1 to time 4. Out of 23 content areas, skill level in 5 content areas was significantly improved after 5 months in the TLC transition program. Correlated groups t-test compared teacher mean scores for categories at time 1 and time 4 ($p < 0.05$).

Summary Issues

1. Intervention to prepare students for transition demonstrates promising results.
2. Rate of change in skill varies by category and type of skill.
3. Skills develop at a differential rate and are retained at different levels of skill.
4. The time allocated to elicit, practice and apply competencies requires years, not months.
5. Practice of skill applications in natural settings with verisimilitude to future performance settings, is essential.

Residential Treatment for the Habilitation of Individuals with an Asperger Syndrome Diagnosis

The psychological, social, psychiatric and educational issues associated with an Asperger Syndrome diagnosis require the use of a cohesive, multimodal intervention.

Cohesiveness is determined by the degree of cooperation and collaboration between those professionals involved in the treatment objectives and the integration of treatment strategies across the primary treatment settings, home, school or work, and community.

Multimodal intervention requires that the treatment components include medication therapy, cognitive behavioral therapy and psycho-educational interventions.

Evidence based treatment interventions require that each treatment component have demonstrated empirically derived efficacy. It also requires that the combination of efficacious medication, behavioral therapy and psycho-educational strategies provide a synergy beyond the effectiveness of each provided separately.

Researchers identified the need for new conceptual frameworks for the process of intervention development and research in residential and community clinic treatment settings. They also noted that the definition criteria for efficacy are limited by the realities inherent in practice settings, complexity of clinical problems presented by clients and contextual factors associated with treatment outcomes. A key question is: What is the evidence base for determining effective treatments?

Criteria for an evidence base includes a well defined sample and treatment. Sample size of larger than 30, empirical outcome data derived from standardized measures, reliability and validity measures, and well defined setting parameters are all prerequisites.

Residential treatment settings that demonstrate an identified cognitive behavioral theoretical treatment model within a well defined set of admissions and treatment development processes have the potential to generate a cohesive, multimodal implementation of research based treatment.

Evidence based treatment requires the use of data collection systems that are integrated into the treatment setting and its practices.

Admission standards that define the criteria for admission and discharge, if specific, create a sample upon which to apply outcome measures for each treatment interaction in each treatment setting within the residential milieu.

The residential treatment milieu offers the opportunity to provide an engineered environment for the purpose of creating specific treatment outcomes. Student-clients with an Asperger Syndrome diagnosis require a prescribed environment that will teach pragmatic, social, psychological, educational and community living skills.

The way in which the treatment environment is described by its schedules, activities, and priorities for self-reliant behavior will influence the competencies to be elicited and practiced.

The Learning Clinic (DuCharme, 2003) reports that individuals with Asperger Syndrome diagnoses are able to demonstrate the academic, social, vocational and independent living skills to a high degree beyond the expected levels previously predicted by research.

The design of residential milieu using a consistent theory into practice approach may create reliable performance standards and authentic community application. The use of well designed, small scale, multiple treatment settings provide the opportunity to measure skills, define individual treatments, establish self-paced programs with performance standards and prescribe steps toward independent living, work or advanced education.

The use of technology is a necessary part of the treatment environment. Computers for education, training, self-assessment and performance records is critical. Video-monitoring for behavior assessment and self modeling is an effective application of computer-video integration. Also, the use of video monitoring of classrooms, residential and work setting enable treatment settings to provide mentoring and coaching to the Asperger Syndrome person from a distance. Video monitoring also provides a method for less intrusive immediate feedback and performance cueing.

The residential milieu demonstrates a closed environment in which to provide safe, well-structured opportunities to elicit, practice and apply key competencies required for independent living. However, the selection of a residential setting is problematic for many parents.

More parents of children diagnosed along the Autism continuum are seeking services. In California, the number of cases of autism nearly doubled over the past four years to more than twenty thousand. The cause is unknown, but clearly not related to population increase. The study that identified the increase was conducted by the California Department of Developmental Services. The researchers tracked the number of identified cases to twenty-one regional centers where autistic children and their parents receive government-funded services. The report showed that the caseload increased by 97 percent, from 10,360 in December 1998 to 20,337 four years later.

The most difficult choice for many parents is the option of residential school and treatment. Parents have learned that they are often alone as advocates for their children and are reluctant to transfer "parenting" roles to others who may be less informed about what their children need.

The complexity of needs of each individual child or adolescent requires careful consideration when choosing services. Education, cognitive and social assessment, clinical treatment such as individual, group, family counseling, social skills activities, pragmatic language programs and other related services need to be available. Each residential program must be suited to the individual child and his or her residential needs.

Consideration of the "whole child's" needs and the family's ability to meet those needs at home often results in a decision to seek a residential placement. As a precondition for starting the process of evaluation and review of the residential options, site visits are important. But decisions need to be made as part of a sequence of steps:

First: Access consultation to determine a reliable diagnosis of the child and obtain recommendations about how to best meet the child's needs.

A precise diagnosis and functional analysis of the child's present behavior and psychiatric, neuropsychological, educational and medical needs are of critical importance. A comprehensive baseline of the child's individual program needs is the foundation for decisions about residential program strengths and weaknesses in relation to what the child requires.

The purpose of residential, comprehensive services is to enhance appropriate levels of achievement and independence and by doing so compete with counter productive past behaviors.

Second: Allow the "option" of a residential school – treatment placement. Decide to research residential programs with an open mind.

The correct choice of a residential school, if made by the parent alone or in conjunction with an educational consultant, will provide a complete and beneficial experience to the entire family. Most importantly it will provide a direction and the necessary supports to obtain future independence for the most important concern: the future wellbeing and independence of the child. Planning for a life post-high school must begin early and comprehensively.

The pressures associated with a child's struggle in their current placement often obscure the cost implications of services. Financial responsibilities may create a new set of unintended or unexpected burdens. Professional financial guidance for the family is also an important component to help make a selection from among the available realistic education and treatment options.

A cautionary note is in order. Residential schools that are comprehensive are also costly. Parents should carefully consider the financial implications of assuming the costs personally, or sharing cost with an LEA, as part of a cost sharing agreement for placement. Residential care often provides impressive results that cannot be duplicated by less comprehensive services. Also, residential programs are often a long-term commitment.

Third: Research the options for help. This may include an ombudsman, professional educational and treatment consultant, or attorney specialist, and the resources for assistance available through the local education agency (LEA) and State Department of Education. Become informed of the child's and family's rights and protections under state and federal law.

Reliance on the local education agency (LEA) and on federal guidelines for identification of need and referral are critical issues. One must follow state and federal guidelines for special education eligibility for services, and obtain approval from the LEA for services to be provided. Funding and support for residential education and related services are dependent on specific criteria. If a parent does not follow the correct process they may forfeit the entitlement to LEA assistance and IDEA protection.

A knowledgeable advocate and/or attorney with an "education" placement specialty may be very helpful. An objective person to assist may provide some barrier to the emotional stress and complexity of the placement process that can overwhelm parents.

Fourth: Use the processes provided by the federal statutes and guidelines described by IDEA (Individuals with Disabilities Education Act) to include
appropriate agencies in the decision process.

Fifth: Research the specific residential school options that are suited to the child's particular needs.

Initial questions to ask and evaluate when considering a residential placement are:

Who are the children and adolescent students served by the program?

What is the range of their diagnoses?

What are the levels of student intellectual functioning?

What teaching methods are used to provide instruction?

What related services are offered?

What are the qualifications of the staff?

Children learn as much, or more, from their environment and peers than from their classroom teacher and therapist. It is important to observe the residential school milieu, the routines, schedules, and levels of staff supervision during activities.

Careful consideration of the child's peer group is needed to ensure an appropriate intellectual and social match. Also, certain clinical diagnoses do not fit with other children. Aggressiveness, "street-wise" behaviors, delinquency issues, conduct disorders, sexual aggression and exploitiveness are some of the major contraindicated peer-matches for the Asperger Syndrome child.

Sixth: Identify a list of suggested school and treatment programs and prioritize parent options.
Be an informed consumer of residential treatment and educational services. Program brochures and online web site information are only a start in evaluation of the program quality and appropriateness. The

way in which the residential program environment is described often defines how staff will perform their roles.

The way in which the residential living setting is described and staffed will influence the nature of interaction between staff and child and child and peers. If, for example, the child will reside in a dormitory of 20 with same sex peers of different ages, their interaction, supervision and staffing schedules will be different from smaller, co-ed settings.

The way in which the instructional setting and facilities and resources are made available to children and adolescents is also an important consideration.

Determine how large the classrooms are, how many students in each class, the student-teacher ratio, instructional approaches (is computer-assisted instruction available?). Keep in mind that smaller is generally better when evaluating classroom size and number of students in the class.

Effective programs can demonstrate the degree of cohesiveness between each part of their program. Cohesiveness means the sharing of goals and objectives by all staff, across all settings. When there is cohesiveness teachers, residential living staff, clinicians, medical staff and administrators will share philosophy, treatment aims, educational goals and independent living aims. Staff will be able to illustrate how practices relate to program and individual child goals.

Another very important consideration is how well the residential services provide preparation for independent living, community involvement and transition to work and additional education. The residential curriculum should illustrate pragmatic strategies for practical daily living skills. The curriculum should also lead to evidence of self-regulation and behavioral repertoires that demonstrate increasing student independence and community involvement. The program should provide the parent a written description of the structure of the daily routines and activities, e.g., clarity of objectives, resources, setting description, and student-staff ratio.

The effective residential program will require a “cohesive” approach to education and treatment. Education and treatment goals need to be shared by all staff in each part of the total program. Assessment of objectives is best considered across settings, e.g. in each classroom and other school and residential settings used by each student. Clinicians and related services staff need to be integrated into the systems of care and education in a “seamless” way. All staff require a schedule that allows frequent planning sessions. Staff are better able to support student gains when they share clear, precise objectives and strategies. It is preferred that all staff are employees of the school to retain a coherent, consistent approach to the child’s needs.

Medication management, psychological services are best provided in conjunction with observational data from each staff member providing services to the child.
A parent may wish to see how data are collected and reported to children and parents. Certainly the more systematic are the collection of performance data of children, the better the decision making will be about what and when to change aspects of the program.

The collaboration between staff members requires that all staff be employees of the program. Independent consultants providing services may be an indication of “fractured” services and lack of coordination and consistency in service delivery.

Residential programs should be able to provide staffing schedules to illustrate level of staffing throughout a twenty-four hour, three hundred and sixty-five day period.

Ask to see staffing schedules that indicate levels of supervision during the course of a twenty-four hour day, procedure manuals, and schedules of staff training sessions.

It is important that the program can ensure adequate reliable twenty-four hour awake supervision is available to the child. Students need supervision during sleeping hours – not all children sleep during the schedule they require.

Also, establish that all staff have state and federal background checks, and that the program has a “staff drug and alcohol use” monitoring policy to ensure the absence of drugs and alcohol.

Other factors related to selecting a residential program require research and systematic investigation. Internet searches are informative and time saving. On-line descriptions of programs will provide basic information such as geographic location, costs, philosophy, staffing and students served by age and diagnosis. The program web site will outline admission criteria and the steps to follow in the admission process. Contact persons are usually identified at the web site.

Seventh: Visit the school without the child after records or information summaries are reviewed by school admissions staff.

Visit the program several times. Visit first without the child. And then, observe aspects of the program, speak to students, staff and other parents, then bring the child for an interview. If the child is included in school visits before the parents screen out inappropriate options the child may become confused and anxious by their perceived differences in program options.

The admission process should begin with a review of past education and treatment, past services provided, recommended services and performance histories. After the review, one should assess the program's philosophy, offerings, and structure during a site visit without your child's presence. If parents are considering a co-ed program, they should be sure that male and female students are present in about equal proportion. The age range needs to reflect both younger, same age, and older students in relation to the child's age.

Same-sex program, all boy or all girl, have advantages and disadvantages. Are there options for same-sex or heterosexual classes? Consider both in relation to the child's age.

Parents need to ask to speak with parents who have a child in the program who is about the same age as their child. Ask questions about their experiences and what they perceive program strengths and weaknesses to be.

Determine the openness of the campus to parent visits and the criteria and conditions for the child to visit you at home. Ask if parents are expected to follow program procedures during the child's home visits.

Ask if the program is open to parent visits, visits by parent designees and what are the conditions placed on students in order for them to visit home. How frequently are parent visits permitted? How frequently do school and residential staff contact parents to discuss progress and prepare for home visits? After the review of the program, visit its classrooms, see its students, speak to staff and students then follow-up with a visit by the child for an interview.

Eighth: If the decision is to proceed with admission, bring the child for an interview and site visit after the parent visit is made.

Prepare the child for their visit to the school and the interview. A few days prior to the visit rehearse the child about what they will see and who they will meet.

The residential school option is often best presented by the child's counselor, therapist or evaluator in collaboration with the family prior to the site visit. Educational consultants are of significant assistance to families in ways to discuss residential options as a family.

The age of the child will help determine the degree of choice and decision-making in the process the child will have. The child needs to know that he or she will participate in, but not control, the decision-making process of choosing a program.

Children are advised to prepare a list of questions they want to discuss, but only after they review written and website materials that describe the school to be visited.

Students often want to know about dress codes, discipline policy and procedure, roommates, home visit schedules, and other personal concerns. Help them articulate their concerns. Assist the child to formulate criteria for assessing a residential program that relates to their concerns.

It is helpful if the child visits classrooms, speaks with several staff and receives a “tour” by a student at the school.

The ways in which a child’s performance is assessed and reported to the parent is an important consideration. Read examples of progress reports and ask about the frequency of written reports to be sent home.

A book entitled, Asperger Syndrome: A Guide for Professionals and Families (DuCharme & Gullotta Eds. 2003) will provide more detail about types of services and optimal considerations.

Sufficient time to see facilities and ask questions of school personnel are important in order to have the child form an impression of students, staff, and milieu.

It is often very helpful for the child to have an overnight stay for several days prior to finalizing the admission. An assessment based on the actual experience of the child may save a missed step and inappropriate placement. Visitation will be more reliable and authentic for the child if they actually walk through the program expectations rather than being “told” about them.

Ensure the child that a visit is not the same as an admission into the program and that they will not be left at the school after their visit is complete.

The residential program director will be able to provide licenses and certifications required by each state agency in order for the program to operate, e.g. State Board of Education and State Child Care Agency licenses appropriate to the program. The parent may check with licensing agencies to determine if there is a history of causes for action against the program.

The distance of the school from the child’s home and state is less significant than the “fit” of the program to the child’s needs and family values.

If the parent’s research indicates, and the parent believes the school is a possible placement, then arrange for a brief stay for the child of three to seven days duration. The first thirty days usually provides important additional information about the experience which the parent and the child will have over the long term.

A quality residential program will articulate all aspects of its program and where those program aspects will lead the child.

Residential programs, comprehensively designed, provide a great deal more than education of traditional academic skill. Preparation for a future life that includes additional post high school education, independent living, vocational preparation through career exploration and sufficient social awareness and skill to navigate a social life are the equally significant provisions.

Evidence-Based Instruction for children with Asperger Syndrome

Today more children are identified as having Asperger Syndrome, and more articles are written, but paradoxically, there is no proportional increase in valid, reliable research. Nevertheless, general information based on anecdotes and less rigorous clinical observation is influencing education practice. Review of 385 studies of Asperger Syndrome students found forty-nine sources specific to academic instruction. Of the forty-nine articles only six used a sample size of over thirty subjects. Of the six studies that reported a sample size over thirty, some included sub groups such as ten Asperger persons, ten Attention-Deficit/Hyperactivity Disorder persons, and ten non-clinical persons as comparison groups. The total sample was over thirty, but the target group of Asperger Syndrome students was represented by only ten subjects. All forty-nine studies reflected research design that compromised the validity and reliability of the reported outcomes.

It is surprising to discover that the research of the last dozen years provides so little empirical data on Asperger Syndrome. However, there is a body of evidence that is helpful to the teacher and may be of heuristic value. This chapter will discuss that evidence using a pragmatic approach to both empirical and anecdotal information. Where the evidence has limitations, we will note the weaknesses.

The current status of theory and research about Asperger Syndrome requires that the teacher and clinical team develop data for each child, one child at a time, within observable pragmatic methodologies. It is the responsibility of the educator to use methods of instruction and observation to develop competencies for each student. The information in this chapter will assist the instructional team members to develop procedures that will yield data to assess the benefit to the student during his time at school.

To develop competencies the teacher will first, look at the child, examine expectations, modify the instruction, and then will assess the benefit. A pragmatic approach is described below.

- *First,* a description of the person with an Asperger Syndrome diagnosis provides a summary of characteristics that compare similarities and differences between Asperger Syndrome and other diagnoses.

- *Second*, the expectations inherent in the student role in a classroom are compared to the characteristics of a person diagnosed with Asperger Syndrome.

- *Third,* the optimal program modifications for increasing classroom performance and academic success are described. Specific modifications are provided to guide academic decisions made on behalf of the person with Asperger Syndrome.

- *Fourth*, a plan is outlined for the purpose of assessing educational benefit.

Pharmacological Interventions

There is limited research on the efficacy of psychotropic medications for children with Asperger Syndrome, Pervasive Developmental Disorder, Not Otherwise Specified, or Autistic Spectrum Disorders in general.

There are no medications designed to specifically treat autistic spectrum disorders. There is no medication that is going to "cure" or eliminate the disorder. However, there are medications which are commonly used to treat some of the "symptoms," or behavioral manifestations, generally associated with these disorders. These behaviors include irritability, aggression, stereotypy, hyperactivity, inattention, anxiousness, and mood lability. Co-morbid conditions are not unusual with Pervasive Developmental Disorders (PDD). Co-morbid diagnoses most frequently associated with Asperger Syndrome and other Pervasive Developmental Disorders include Attention-Deficit/Hyperactivity Disorder (ADHD), mood disorders, anxiety disorders, or Oppositional Defiant Disorder (ODD) (Klin, Volkmar & Sparrow, 2000). As the number of co-morbid diagnoses increase, the number of prescribed medications generally increase. Typical classes of drugs used include the atypical antipsychotics, mood stabilizers, SSRI's, and anti-anxiety medications.

Two studies published in 2003 reported on the effectiveness of the atypical antipsychotics with Pervasive Developmental Disorder youngsters. A three-year study of preschool children with severe behavior problems, and diagnosed with Autism or Pervasive Developmental Disorder, Not Otherwise Specified, found that risperidone was effective in improving affect and behavior control (Masi et al., 2003).

Hollander et al. (2003) also evaluated the use of risperidone with preschoolers who had severe behavior problems. This study concluded that risperidone was effective in reducing irritability, repetitive movements, and hyperactivity. They noted there were no significant improvements in social withdrawal or inappropriate speech. Another atypical antipsychotic, olanzapine (zyprexa) produced a modest decrease in disruptive behaviors (Hollander et al., 2003). The main side effect reported for these atypical antipsychotics was weight gain.

Hollander et al., (2003) also reported the effectiveness of other categories of prescription medications for autism: mood stabilizers, and SSRI's. The mood stabilizers, valproate (depakene) and levetiracetam (keppra) were found to decrease aggression, labile mood, and impulsive behaviors. In patients diagnosed with mild autism and a family history of manic depression, lithium was reported to be beneficial.

In non-controlled and retrospective studies, some of the SSRI's were associated with a reduction in symptoms (Hollander et al., 2003). For example, in adult autistic patients, fluvoxamine (luvox) and sertraline (zoloft) were associated with improvement in repetitive thoughts and behavior, aggression, social skills, and language. Decreased inattention, hyperactive and repetitive behaviors, and social skill deficit, and improved communication skills, were associated with low doses of venlafaxine (effexor). Overall, the SSRI's were found to be more effective in reducing symptoms associated with the mood disorders and obsessive-compulsive disorder.

A recent review of prescribed medications for 24 students diagnosed with Asperger Syndrome or Pervasive Developmental Disorder, Not Otherwise Specified and enrolled at The Learning Clinic (a private residential school in NE CT) found that 54% received an atypical neuroleptic. Forty-two percent (42%) of the students received medication for inattention. Antidepressant or mood stabilizing medication was prescribed for 75%, and 50% of the antidepressant medications were SSRI's; 40% of 70 student-clients in treatment were diagnosed with mood disorders.

In summary, although there are no medications designed to specifically treat pervasive developmental disorders, there are medications which are commonly used to treat many of the "symptoms," or behavioral manifestations generally associated with these disorders. The following charts summarize the typical categories of medications for behavioral and psychiatric problems:

Hyperactivity, Inattention and Impulsivity
Psychostimulants Alpha-adrenergics Atypical antipsychotics
Aggression & Irritability
SSRI's Alpha-adrenergics Beta blockers Mood stablizers Atypical antipsychotics
Anxiety
SSRI's Alpha-adrenergics Minor tranquilizers Busprione
Preoccupations, Rituals, Compulsions
SSRI's TCA's Atypical antipsychotics Alpha adrenergics
Depression
SSRI's TCA's

A description of the person with an Asperger Syndrome diagnosis

More recent research shows an Autism Spectrum of disorders (Baron-Cohen et al., 2001), but the defining criteria that differentiate sub-groups are not clear. As a result, many individuals are diagnosed incorrectly. Asperger Syndrome, High Functioning Autism, Autism, and Non-Verbal Learning Disability are

described to have overlapping symptoms that differ in degree (Mayes et al., 2001). These diagnostic groups, as well as Schizophrenia, require more research to specify firm differentiating characteristics. Clear diagnostic categories are needed to explain etiology, academic performance, and social development. However, the medical model of classification used by the DSM-IV and ICD-10 may be ineffective. The degree of severity of characteristics may best be described as points on a continuum of symptoms (Klin et al. 1995) rather than as a single diagnostic classification of symptoms.

One such characteristic is intelligence. Educators and clinicians are often asked to interpret the meaning of intelligence in the context of a Non-Verbal Learning Disability diagnosis, or an Asperger Syndrome student profile, or a child described as High-Functioning Autistic. The current state of knowledge provides little clear guidance to professionals who are required to provide answers.

Intelligence

Intelligence test scores do not necessarily predict classroom success, nor do the scores predict skills associated with higher order cognitive tasks. Information processing, retention of higher order tasks, and problem-solving strategies are idiosyncratic and different for each Asperger Syndrome student. Intelligence is one factor and, often, an important asset. However, the level of cognitive inflexibility observed in the behavior of Asperger Syndrome, High Functioning Autism, and Non-Verbal Learning Disability students competes with the adaptability required to solve novel problems or similar problems in novel situations. Intelligence measurements of normal to gifted cognitive ability are not a reliable predictor of executive function and adaptability (Rhinehart et al. 2002) among students with Asperger Syndrome, High Functioning Autism, or Non-Verbal Learning Disability.

Rourke (1995), Klinn, et al. (2000), and Schopler, et al. (1998) state that normal and higher intelligence quotients are more frequently reported for students with an Asperger Syndrome diagnosis. Asperger Syndrome students demonstrate, but not to a statistically significant degree, higher verbal intelligence than performance scores by about two standard deviations on the WISC III test (Minshew et al. 2002). Intelligence scores indicate greater learning potential for Asperger Syndrome students than for students with autism diagnoses who may score in the seventy-point Full Scale IQ range. The WISC-R or Stanford Binet IQ score is a helpful guide to teachers in planning instructional programs since intelligence scores are typically stable and reliable overtime (Canivez & Watkins, 1998). But even higher intelligence test scores require further analysis. The Full Scale score places the student on the normal curve in relation to others of his chronological age. The detail in the subtest score pattern on each of the two types of tests, Verbal or Performance, provides a profile of specific strengths and weaknesses (Ozonoff et al. 2000).

Memory, "Anxiety," Performance

Other dimensions of Asperger Syndrome are atypical memory, information processing deficits, and "anxiety," as well as the four dimensions reported by Wing and Gould (1979): (1) aloofness, (2) passivity, and (3) active, odd, inappropriate approaches to others, and Wing (1988): (4) failure to acquire social rules through the course of normal development. All dimensions of Asperger Syndrome may compete with learning and are associated with academic performance deficits. These same factors may be similarly present in the variations in performance of students with Autism, High Functioning Autism, and Non-Verbal Learning Disability. Aloofness, passivity, active odd inappropriate approaches to others, and the inability to acquire social rules through typical developmental experience may impede the Asperger Syndrome student.

Dr. Liza Little (2001) reports that Asperger Syndrome students experience ridicule and peer "shunning" in 94% of the cases in a survey of over 400 parent reports. Peer rejection may contribute significantly to school avoidance performance anxiety and to declines in academic performance. If the child avoids attending school, he is less likely to learn. Certainly Asperger Syndrome symptoms contribute to social isolation and to the ongoing inability to develop social and communication skills with peers. Left to his own devices, the Asperger Syndrome student has the odds against him. Positive social contact is necessary to develop the social skills needed for effective communication with others, at home, at school, or on the job.

Communication

The research on levels of pragmatic language skills demonstrated by Asperger Syndrome students over the last decade reveals a persistent pattern of pragmatic language deficits (DuCharme & McGrady, 2003). Asperger Syndrome students have more difficulty communicating with peers than with adults. And they have more difficulty communicating with peers and adults than do comparison groups.

Asperger Syndrome is, in large measure, a communication disorder. Understanding language processes illustrates that language is the partner of memory and shapes the essential concepts for social learning, pragmatic skills, and internal control over behavior (Koning & MagiII-Evans, 2001); (Jolliffe & Baron-Cohen, 1999). Language and behavior patterns become increasingly difficult to remediate as the child moves from pre-adolescence to young adulthood. Odd behaviors such as self-talk, isolation from peers, cognitive distortion, and denial of aberrant behaviors become egosyntonic and highly resistant to treatment.

Asperger Syndrome students often appear, at first view, to be verbally bright, facile, and effective in their communication. A more careful analysis of their language structure, cognitive flexibility, word use, and especially their ability to process connotative meaning reveals substantial deficits (Church et al., 2000).

The Asperger Syndrome student is often characterized by teachers as literal, concrete, inflexible, and tangential in verbal expression. These behaviors become more frequent as the child moves from elementary to middle school, junior high, and high school.

The Asperger Syndrome child is then subjected to an increasing number of teachers with academic content specialties. As these teachers establish personal instructional styles, classroom routines, and grading expectations, the Asperger Syndrome child's performance becomes more discrepant with peers. As grade level increases, the level of symbolic and abstract language used by teachers also increases. The child's immersion in such higher-level language creates a situation that accentuates the child's difficulties (Adreon & Stella, 2001).

The Asperger Syndrome student demonstrates uneven language skill development (Barnhill et al., 2000). Language levels are acquired through the curriculum at developmental stages; sounds (phonemes), word bits (morphemes), semantic skills, syntax (sentence structure), discourse (large meaningful "chunks"), and meta-linguistics (higher order thinking). As the Asperger Syndrome child grows older, these skills appear to be more delayed. To further complicate the child's educational life, the teacher and the curriculum require receptive language skills, reading ability, and expressive language. Teachers also demand written summaries, research reports, notes, and homework.

The central point here is not to be misled by intelligence scores. Early language fluency and topical, narrow bands of expertise are often characteristics of the Asperger Syndrome child. Further, we need to recognize that the child's language experience may be limited by his having few social contacts and few language models. Television programs and computer games are not known for high levels of language, syntax, or meta-linguistic examples. Many children demonstrate receptive language deficits that add to poor language structure.

Neurological Development

Dr. M. Levine, in his book *A Mind at a Time* (2002), discusses the differences between neurotypical functions and neurodysfunctions in the development of children. He suggests that educators need to recognize the "hidden dysfunctions" that affect children's learning and adjustment to the social demands of their environments. Dr. Levine outlines the neurodevelopmental systems that influence attention, memory, language, motor behavior, spatial ordering, sequential ordering, higher thinking, and social judgment. Dr. Levine describes the interrelationship of these systems. Further, he discusses individual and inter-system functions as they affect performance. Using student profiles, Dr. Levine reveals strengths and weaknesses in each "system" and the implications for inter system function. The Asperger Syndrome student profile indicates that genetics, family, environment, temperament, and emotionality as well as peers, culture, health, and education interact with intersystem functions.

Dr. Levine's point is that in his view and experience "splitting rather than lumping" children is helpful in developing treatment and educational strategies. He suggests that "lumping" children into diagnostic categories is not sufficient. We agree that individual Asperger Syndrome profiles are best viewed in relation to structure and tasks within the education environment.

Dr. Levine alerts the reader to the meaning of neurotypical and neuroatypical functioning in children and adolescents. He minimizes, however, the importance of accurate diagnostic differentiation, and he makes only passing reference to Asperger Syndrome. The current literature points to cognitive and social-judgment differences along a continuum (Klin, Volkmar & Sparrow, 2000); (Jolliffe & Baron-Cohen, 1999); (Niehart, 2000). Such differences are best viewed as a set of concurrent symptoms that may form an identifiable pattern, such as the 15 developmental indicies previously discussed (see Chart 3).

Control of Attention

We suspect that the Asperger Syndrome child's control of attention and ability to shift attention significantly influences classroom performance. Consistent attention is absent and varies according to academic tasks and environmental influences such as class size, type of instructional method, and response mode expectations (DuCharme & McGrady, 2002); (Jackel, 1996). Control of "intake" of information and "selection" of information is also compromised for Asperger Syndrome children, subjecting the child to stimulus overload and behavior disinhibition.

Anxiety observed as a co-morbid condition with Asperger Syndrome may be more appropriately described as a function of "stimulus overload". The task may demand sequential steps and simultaneous responses. Under such conditions disinhibited behavior, task avoidance, accelerated speech, increase in speech volume, and requests for clarification of task requirements may produce what we see as "anxiety". The "anxious" behavior is a function of Asperger Syndrome, an inability to process multiple stimuli.

DuCharme and McGrady (2003) point out that the students' control over various "mind activities" may be compromised in ways that reveal tangential thinking, free associating, and day dreaming behaviors often associated with Asperger Syndrome. Other "mind activity" such as control of the span of focus is also significant. Short attention span is directly related to the complexity of the instructional tasks, (the cognitive level required to perform the task), and the time allowed to complete the task. The ability to shift attention is often lacking in Asperger Syndrome students as they may perseverate and extend their attention beyond what is expected (Rhinehart et al., 2001). Other neurotypical functions such as setting and monitoring the pace and quality of performance and the ability to apply self-reinforcement are often compromised for an Asperger Syndrome student (DuCharme and McGrady, 2002).

Atypical neurodevelopment influences memory functions such as short-term, active mediation, and long-term. Memory efficiencies are positively influenced by reliable, well-rehearsed formats that involve opportunity for over learning and systematic reapplications of previously mastered material (DuCharme, 2003). The Asperger Syndrome student's memory for discrete facts may be facilitated by practice and task organization. Comprehension, analysis, synthesis, and evaluation are significantly more problematic for the Asperger Syndrome student (Niehart, 2000); (DuCharme, 2001).

The body of literature on Asperger Syndrome pays little attention to medication and psychopharmacological therapies for behavioral issues. The prevalence of mood and anxiety problems among children with Autism and Asperger Syndrome (Kim, et al., 2000) are well documented (Tantam, 2000) as are other co-morbid treatable conditions. The emphasis on individual differences in child neurological function is important, but not at the expense of careful differential diagnostic work and multi-modal intervention (Ozonoff et al., 2000).

Expectations Inherent in the Student Role

There is little empirical validation for specialized approaches for children with Asperger Syndrome. Teachers often rely on newsletters, conferences, and the Internet for information. Most books for teachers are based on sporadic behavioral observations, limited samples of students, and inadequate research design (Safran, 2001).

The University of North Carolina at Chapel Hill, Department of Psychiatry, has formed a special division: Treatment, Education of Autistic and Related Communication Handicapped Children (TEACCH). Their researchers have investigated instructional methods that link structured interventions with positive outcomes for Asperger Syndrome students (Kunce & Mesibov, 1998). The consensus is that teachers need to follow specific guidelines (Ghaziuddin & Gernstein, 1996; Strain, 2001):

1. Obtain current research based knowledge about Asperger Syndrome
2. Use both formal and informal assessment tools appropriate for Asperger Syndrome characteristics
3. Create a consistent and predictable environment for Asperger Syndrome students
4. Provide clear instructions and precise behavioral expectations with consistent follow-through
5. Provide daily assignments, plans, and schedules
6. Identify students' interests for motivation

Task Analysis

The staff at The Learning Clinic (TLC) in Brooklyn, Connecticut use a task analysis approach to instruction. Task analysis is defined as the identification of the set of behaviors and abilities needed to perform a task. The Asperger Syndrome student's initial experience with an unfamiliar task will depend on the structure of the task and the student's ability to perform the prerequisite skills needed to complete the task.

Task analysis may be classified by type, size, and kind. Three *types* of task analysis are content, interaction, and pre-requisite. A content task analysis requires that the teacher identify teachable components, determine relationships among components, and then sequence the instructional components of the task. In content analysis, each component represents a response or set of responses, and each component is stated clearly as a behavioral objective. The relationship among components may be:

Superordinate (A must be learned before B)

Coordinate (Components may be learned in any order)

Interaction analysis requires the teacher to specify the teaching procedures for each component of the task. The teacher must define the degree of practice (i.e. massed or distributed). The teacher must also describe the degree of interaction with the student, such as ways to prompt, confirm, or model students' responses. The teacher's method of presenting the task must be stated. The teacher might prescribe forward chaining, backward chaining, or total task presentation.

- In forward chaining you present the elements of the task in the order that is needed to complete the task.
- In backward chaining you begin with the final product and work back to identify elements and their relationship to one another.
- In total task presentation you present the complete task along with all its elements.

The teacher prescribes the emphasis on elements and the effective presentation to match the Asperger Syndrome students' interests.

The third type of analysis is prerequisite task analysis. This type of analysis defines the abilities and previous experiences needed to perform the components of the task. If the Asperger Syndrome student is weak in prerequisite ability, the teacher may

- Teach the prerequisite skill before beginning the task
- Adjust the material to compensate for a student weakness (e.g., dysgraphia, compensated for by use of the computer).

The *size* of the task refers to the number of units or to a skill hierarchy. The *kind* of task might be perceptual-motor as in catching a ball or buttoning a shirt. Another kind of task is symbolic – conceptual as in reading, writing, and computing. The more abstract the final objective, the more complex the task. Bloom's taxonomy of the cognitive domain offers examples of kinds of tasks.

The purpose of task analysis is to examine the requirements of the classroom and, more precisely, the teacher's expectations of the Asperger Syndrome student. Teachers often act on expectations for prerequisite behaviors that the Asperger Syndrome student has not yet learned. When prerequisite behaviors are not clarified or taught, the Asperger Syndrome student is likely to fail.

Content Task Analysis

The student's behavior can be examined using content analysis of teachable coordinate components. Fourteen components of behavior are described below.

1. Attending Behaviors. The teacher expects the student to demonstrate the following abilities:

a. sit in a chair at a desk for a specified period of time
b. follow teacher directions
c. orient to the task
d. scan information from printed text
e. discern task expectations from material presented
f. demonstrate necessary visual-spatial capabilities
g. focus attention on relevant stimuli
h. control attention to apprehend and start the task
i. shift attention to the appropriate task
j. repeat the task
k. ignore irrelevant, tangential stimuli and attend to relevant stimuli
l. perform multi-task operations relevant to completing the task

The Asperger Syndrome student is subject to distraction from sound (Bettison, 1996) and from sight (Burack, 1994). An unfamiliar task or a task that requires an association between a previously taught concept and new application of skill will shorten task perseverance (Minshew et al., 2002) and increase error rates (DuCharme and McGrady, 2002).

One-to-one or small teacher-pupil ratios help the student to sustain attention (Fondacardo, 2001). Conversely large classrooms with high student-to-teacher ratios may lead to inattention.

2. Responding Behaviors. The teacher in a grade level or special education classroom expects specific levels of responding behaviors such as:

a. verbal skill sufficient to communicate answers to teacher's questions or to articulate an academic-content based question or a reliable statement of feeling
b. pragmatic language skill at a sufficient level to comprehend communication based on social judgment that is typical for peer and adult interaction in the classroom
c. visual motor skill prerequisite for response to the typical task format, instructional method, or assistive technology
d. writing skills prerequisite to basic task format, and academic level required for classroom performance
e. adequate level of comprehension of written or verbal material that requires a student response
f. organizational, executive function skill to negotiate the classroom environment, academic task demands, homework, and/or independent organization of classroom-related materials such as teacher hand-outs, notes, note taking
g. reading skill and reading comprehension ability required by text, CAI, or other instructional materials
h. the ability to reliably demonstrate a level of perseverance required by the typical classroom assignment given as class work or as homework

i. the ability to sequence information at different levels of cognitive complexity so as to meet the academic task requirement of the instructional material

j. memory skills
   1. short term memory
   2. long term memory
   3. memory for facts
   4. associative memory
   5. memory for denotative and connotative items

The ability to demonstrate sufficient memory skills to acquire and retain academic content is often assumed. The student is expected to recall and apply the strategies and content when elicited by task requirements. All of these skills are part of the expectations inherent in the student role.

The behaviors described as responding present problems for the student who shows the characteristics of Asperger Syndrome. Verbal skills are present within a narrow band of interest, but broad based knowledge and skill are typically absent. Problem-solving, facile recall of past solutions, and verbal negotiation are also absent skills. The TLC Pragmatic Language Skill Survey indicates consistent and persistent deficits in four categories of communication; topic, purpose, abstraction, use of visual-gestural cues (DuCharme, 2003). Organization skills, inferential comprehension, memory, perseverance, sequencing, and ordering part-whole relationships are reported to be problems for Asperger Syndrome students.

3. Reinforcement Behaviors. This pertains to a student's ability to:

a. provide contingent positive social reinforcement appropriate to setting, situation, and persons (peer or adult)
b. assert negative reinforcement in a contingent and appropriate way
c. receive, process, and respond appropriately to positive reinforcement and other classroom incentives such as grades, awards, status
d. perceive, accept, and understand negative reinforcement offered by authorities, peers, adults, and other persons
e. demonstrate a level of motivation in response to either positive or negative reinforcement used in the classroom setting.
f. demonstrate evidence of a hierarchy of internal self-reinforcement consistent with classroom values and sanctions
g. create hierarchical menu of positive reinforcers
h. show a positive response to vicarious reinforcement used in the classroom such as imitation of student behavior following the positive reinforcement of that student's behavior

The student's under-reaction to reinforcing stimuli is observed in relation to motivation. Reinforcement is observed as a cue to associate behavior and responses rather than as a motivator for future performance. Sustained, goal oriented behavior is absent, thereby making delayed reinforcement ineffective. Little reinforcement, positive or negative, is offered to others by the students at TLC in their spontaneous interactions.

Punishment, on the other hand, through response cost systems, loss of activity, status, or privilege is observed to elicit anger, threat, avoidance, and defiant behavior.

4. Initiating Behaviors. Task initiation includes the following abilities:

a. direct oneself so as to anticipate and comply with classroom routines
b. follow directions provided by computer assisted instructions
c. follow teachers' directions to begin classroom tasks, activities, transitions
d. start a task according to directions in the text
e. begin tasks that require the student to use visual-graphic-icon cues

It is observed that self-direction, teacher-direction, and written direction are unreliable methods to elicit task initiation. Computer assisted rehearsal, teacher-coached performance, and the use of icons and visual-graphic directions are effective. These conclusions are based on single subject, multiple baseline, repeated measure designs assessed over time at TLC.

5. Complying Behaviors. This refers to the student's ability to meet task criteria and teacher standards. Task compliance is shown by:

a. accepting correction from teachers, aides, and sometimes peers
b. accepting correction in the public, open situation of the classroom
c. correcting assignments, reading assignments, redoing assignments in a way that corresponds to a predetermined standard

These behaviors – attending, responding, reinforcement, initiating, and complying with standards – present major obstacles to a student with a diagnosis of Asperger Syndrome. The ability to meet task criteria and teacher standards is dependent upon the fit between the student, the task, and task analysis. If the task analysis is correct, and a mastery learning model is used that allows the student to repeat trials and to correct errors, then standards are predictably met (DuCharme, 2001). Teacher-centered instructional methods, lecture formats, and delayed correction and feedback to students are not effective, as measured by student performance on academic tasks.

Additional expectations that may reveal problems for the Asperger Syndrome student are examined below.

6. Completing Behaviors. The ability of the student to finish the assignment depends on:

a. performing specific tasks according to the presented method
b. working independently
c. returning a completed product to the teacher

7. Transitioning Behaviors. The ability to move from one task to the next and to recognize when to stop one task and begin another depends on:

a. taking independent steps between tasks (e.g., the student can follow a multi-step strategy to solve a math problem and then change from math to science or other kind of task)
b. recognizing and using prompts that signal the need to move from one task to another

8. Cooperating Behaviors. Students are expected to display and maintain a demeanor appropriate to the classroom such as:

a. waiting for another person to finish speaking
b. avoiding arguing
c. taking turns in discussion
d. maintaining appropriate speech volume
e. sharing equipment (e.g., computer time)
f. avoiding ridicule of peers
g. displaying appropriate posture
h. maintaining eye contact
i. requesting to exit the classroom

Asperger Syndrome students, though desiring positive peer relationships, are ill- equipped to control their odd behaviors, clinical symptoms, and poor pragmatic language deficits. Soderstrom et al. (2002) report on characteristics of adults with an Asperger Syndrome diagnosis. The most common (Asperger Syndrome) temperament is characterized by obsessive, passive dependent and explosive features. The Asperger Syndrome individual demonstrates a desire for peer relationship and attempts to fit into mainstream expectations (Jones & Meldal, 2001). Little (2001) conducted a peer-victimization survey with a response rate of four hundred and forty-one (70%) parents of Asperger Syndrome and Non-Verbal Learning Disability students. The survey data is arranged by age, gender, and diagnosis. Ninety-four percent of the respondents reported assault or shunning by peers and siblings.

9. Competing Clinical Behaviors. The classroom norm expects Asperger Syndrome students to work without distracting or disturbing others. Elsewhere in this chapter we discuss the clinical issues associated with an Asperger Syndrome diagnosis and review psychiatric symptoms and co-morbid conditions. The teacher must prescribe instruction that competes with the clinical symptoms listed below:

- Perseveration on a topic not related to the classroom instruction
- Obsessive thought
- Inability to shift topics from personal view to data based view
- Threatening behavior, verbal aggression
- Dichotomous thinking – win – lose orientation to discussion
- Confabulation
- Affirming false (data) information
- Not taking responsibility for own actions, resisting accountability
- Stealing
- Sexually inappropriate comments
- Violation of personal boundaries
- Cognitive disorientation, distortion of information

The combination of evidence-based instruction, medication therapy, and cognitive behavioral therapy are recommended for treatment. Behaviors such as speaking out, exiting the classroom without permission, expressing tangential ideas, self-talk, or other behaviors may be reduced (DuCharme & McGrady, 2003).

10. Adapting Behaviors. The ability to move from class to class, and to follow the teacher's prescribed schedule requires explicit directions. Different teachers may have different classroom procedures and schedules. Some teachers have unpredictable, flexible routines that present change in each class. Such classrooms may be described as unilateral and unreliable. To adapt to classroom routines the student must learn to:

a. identify the particular schedule and routine of each classroom
b. follow the schedule and routine

"Closed" classroom environments, such as self-contained classrooms or schools that prescribe consistent routines, provide greater structure and predictability. The Asperger Syndrome student will more readily learn the reliable expectations of a closed setting. Such classrooms are described as unilateral and reliable.

"Open settings" are environments that require multiple transitions within and between classrooms. The "open setting" requires that the student initiate and regulate performance and cooperation. "Open settings" are most suited for group activities that are interactive and oriented toward symbolic – conceptual tasks. The complexity of the task requires a high degree of ability to solve abstract problems. "Open settings" are the most difficult for the Asperger Syndrome student to negotiate.

11. Cooperating with Medication Administration. The ability of the student to accept his need for and use of medication may be prerequisite to performing in the classroom. The student's ability to accept the need for medication on a prescribed schedule may also be prerequisite. The probability that an Asperger Syndrome student will require medication as part of a dual-diagnosis with co-morbid conditions for treatment is increasing. Attention deficit disorders, bipolar disorders, depression, and other mental health conditions require a regimen of medications. The need for prescribed medications to be taken during the school day and at times in the classroom is more evident (Ghaziuddin et al., 1998); (Kim et al., 2000). Important skills to teach are:

a. following prescribed schedules of medication
b. managing one's own medication

TLC uses a specific teaching procedure to enable Asperger Syndrome students to demonstrate reliable self-administration of medication. This skill is a prerequisite for a student's acceptance into an independent living program.

12. Depending on Structure. It is reported in anecdotal and clinical observations that students with an Asperger Syndrome diagnosis are structure dependent. The researches at TLC over the past decade support such observations. The general school curricula includes recess, physical education, music, art, and lunch visits as part of a weekly student schedule. These types of activities are less structured, more open, more dependent on self-initiation and self-regulation. Most Asperger Syndrome students have problems with less structured activities.

Art and music are particularly important experiences for Asperger Syndrome students since these activities often coincide with abilities and interests. The structure of the activity, task type, size, and kind are related to the student's successes. In physical education classes the student's gross motor awkwardness may compete Recess and cafeteria time are most problematic for Asperger Syndrome students. At these times the student's social oddity, poor pragmatic language, self-talk, and fast walking offer targets for peer ridicule and shunning.

13. Completing Homework. The completion of homework to fulfill standards and submission of work on time are two of the most frequent complaints of parents and students about teacher requirements. The lack of homework preparation and failure to complete the work on time result in poor grades and discipline issues. Independent work at home and study time at school require that students remember academic strategies and apply them appropriately. The student is also expected to be sufficiently organized to remember books and materials needed for independent work. All these skills are lacking in the Asperger Syndrome student.

14. Attending School. The ability to maintain regular attendance at school is a critical component of classroom performance. Mastery of patterns and expectations are associated with regular attendance. All of the above components of performance expectations are factors in a student's attendance or avoidance of school and the classroom.

Regular school attendance doesn't always predict classroom attendance. A recently referred student produced a record of excellent school attendance. The vice-principal was his "best friend" as he spent most of his school day in the principal's office and not in his classroom.

Our content analysis of classroom expectations is not all inclusive, nor have we presented teachable subcomponent skills hierarchies. However, the list of tasks do present a picture of misfit between the characteristics of Asperger Syndrome and the expectations inherent in a classroom.

Cognitive Resources

Cognitive Load Theory offers research that is particularly relevant to precise task analysis of academic content. Cognitive Load Theory (CLT) is concerned with the manner in which cognitive resources are focused and used during learning and problem solving (Sweller & Chandler, 1991). The main goal is to guide decisions about instructional design. A complete discussion of CLT is provided in the special issue of *Educational Psychologist* (2003).

CLT explores the relationship between instructional task design and the academic performance of Asperger Syndrome students.

CLT is based on assumptions about human cognitive structure. The theory postulates the relationships between long term memory capacity, schema of mental representation of knowledge, and limited processing capacity of working memory. The mechanisms of working memory have executive control over visual-spatial information such as text and pictures and the phonological loop for spoken text or music. Understanding the limits of capacity and independence of function of these systems may shed light on mastery issues associated with Asperger Syndrome.

Scaffolding whole-task practice "explicitly pertains to a combination of performance support and fading" (van Merrienboer et al. 2003). The scaffolding strategies and supports are organized in a way for a student to demonstrate an action not otherwise able to perform. When the performance expectation is met then supports are gradually removed. Scaffolding strategies are designed with specific consideration to an individual's need for type and number of structured components for performance support. Parsimony is a critical consideration in scaffolding activities as too much support may interfere with learning.

CLT provides for the use of strategies such as coaching, prompts, feedback, modeling, verbal self-rehearsal, check lists and backward chaining of tasks (Chandler & Sweller, 1992).

Measuring cognitive load depends upon self-report measures and objective measures such as physiological, behavioral, and learning outcome measures. The measurement of cognitive load as part of task design and analysis helps us to define the difficulty of different types of learning materials. Learned information may be recalled and applied by Asperger Syndrome students according to its cognitive load measures.

Toward an Optimal Classroom

The recommended instructional methods were tested with students diagnosed with Asperger Syndrome according to DSM-IV criteria, male and female in a ratio of eight-to-one, of adolescent age, and demonstrating a dual diagnosis that includes attention deficit disorder, depression, anxiety disorder, specific learning disability, obsessive-compulsive disorder, and aggressive patterns of behavior. All the students demonstrated normal to gifted intelligence quotients as measured by the WISC-R.

During a ten-year period one hundred and fifty Asperger students, were referred for services because of school failure, school avoidance, and clinical issues. All the students were identified through the IDEA procedures and standards in order to be eligible for special services and meet section 504 criteria.

The following list of instructional modifications for the student with an Asperger Syndrome diagnosis are outlined by topic and key factors. An "optimal" modification is stated as a general recommendation. For example, if identification of staff is the topic and key factors are listed as:

- number of staff interacting with each student
  - each period
  - each morning
  - each afternoon
  - total individual staff each day

- definition of staff role
  - primary staff – self-contained classroom
  - content specialist teacher
  - teacher – disciplinarian
  - academic teacher and social skill teacher and counselor
  - teacher – subject – tutor

then the recommendation is:

Optimal. Optimal is defined to be the staff role that will yield the greatest benefit to the student. The optimal staff role in the example above prescribes one "coach" for monitoring student performance and providing academic tutorial and social skill instruction "in-vivo"; all classes.

Instructional Setting

The "open" vs. "closed" environmental influence on social learning and compliant behavior is described by Tharpe & Wetzel (1969) in their examination of the variables connected to behavior modification in the natural environment. "Open" environments require self-regulation of transitions, interactions with others, and movement in space. "Closed" environments provide external control over behavioral options, number and type of transitions, pre-planned schedules, social and instruction prompts, and degrees of personal freedom earned through reinforcement menus based on standards for performance.

Optimal. Behavioral standards and choices designed for Asperger Syndrome students are limited, precise, and based on the level of self-regulation ability. A closed environment is more effective for instruction and social skill development than an open environment.

Class Size

Adolescent students in The Learning Clinic programs report that the size of the group is important to them. The instructional task and level of complexity also influences their ability to master new academic information. There appears to be, according to student reports, a relationship between the task, the size of the instructional group, and the rate of learning (DuCharme & McGrady, 2002).

Optimal. Teachers' experience over the past twenty years shows that the optimal group size is over three students but under ten. One-on-one instruction, in tutorial format is best to introduce new, complex cognitive material and to monitor the acquisition rate and retention of skills.

Environmental Structure

According to *Webster's New International Dictionary*, 2nd Edition Unabridged (1934) definition, structure refers to "the interrelation of parts as dominated by the general character of the whole, as the structure of society or the structure of a sentence . . . "Structure, then, is an organization of parts in order to make a unified whole. The student with an Asperger Syndrome diagnosis requires a cohesive, precise educational structure. The student's success depends on the way in which the structure of the child's experience at school is defined and communicated.

A whole school approach is designed to coordinate expectations, standards of conduct, sanctions, and student-staff roles across settings. This appears most beneficial when designed on the basis of the student's developmental needs (Grace, 1998).

The Learning Clinic accomplishes the aim of designing a defined structure by employing the whole school with fidelity of treatment model. An example of the effect of fidelity of treatment is shown by an orchestra. In a group of wonderfully talented musicians, one might perform a solo, the strings would have their part, and the brasses theirs. An orchestra leader conducts. The sheet music keeps everyone focused on the piece. Each musician plays particular notes. Harmony passes to our senses and we experience melody. But what happens when a musician plays an unrelated sheet of music? Discord. Discord in the experience of children with Asperger Syndrome is a negative and serious outcome.

There are various means to communicate structure to the student. The structure may be cued by the adult staff with clear, succinct verbal messages. The environment may be arranged to prompt student behavior. A procedural education and treatment approach is used by TLC staff in the form of a written manual.

Optimal. Cues and prompts are needed to maintain the student's perception of the structure designed for him. Guided instruction is optimal for successful task completion.

- Daily plans and standards for self-monitoring their performance during and at the completion of an academic task is consistently reported as helpful by students.
- Checklists and digital devices (organizers) provide prompts and reminders that assist students in keeping schedules.
- Assigned work stations, individual computers, pre-written daily plans, and schedules for each student can serve as prompts.
- Peer-coaching or tutorial may guide student performance with text or script for additional guidance.
- Icons and ideograms illustrate steps needed to perform tasks.

Discipline

The need for a reliable system of discipline is one of the most frequent requests of students at TLC. Many students perceive rules in their previous schools as not enforced reliably. The "inflexible" approach of Asperger Syndrome students to rules and their reliance on predictable structure contribute to their sensitivity about "rule breakers."

Students report that they want to “know the rules”. They want rules to be consistently applied. They want the whole school to have the same rules, standards and sanctions.

Students with Asperger Syndrome are frequently the “junior attorneys” of the school. They quickly recognize violations of rules in others that go unpunished. They explain how their behavior doesn’t quite fit the description of a violation.

The Learning Clinic has developed and employed a behavior management flow chart that is used in all parts of the program – school, residence, and home environments (Diagram: FC). A written manual explains the use of the flow chart for staff, students, and parents.

The effectiveness of a flow chart is noted in the clarity of direction given to students, the time allowed to understand the direction, and the consequences. The clarity of direction states what the student is to do. The direction is precise, brief and within the response repertoire of the child. Then, at least ten seconds are given for the student to process the request and to respond. The ten-second time for response is based on researches by DuCharme in 1972 that measured response latencies for children of different development ages when given verbal learning tasks. The use of the flow chart results in consistent improvement in compliance and decreases the need for negative consequences.

The teacher’s ability to wait a sufficient amount of time for a student to process a request and to respond is critical to the student’s ability to comply with the request. We have observed students who had been defined as “elective mute”. The “mute behavior” is indicative of the student’s inability to respond within the time allowed by the teacher. The child may require more time to formulate and express a response than is allowed. In such cases, the child is not mute. He simply requires more time than the teacher typically allows him to answer.

Optimal. A precise, reliable, school-wide behavior management system in combination with clear verbal directions and sufficient time allowed for response is best for Asperger Syndrome students.

Student Diagnosis and Classroom Mix

The diagnoses of other students in the classroom are important. The diagnosis of Asperger Syndrome, even with co-morbidity, is compatible with some diagnostic groups and not others. First, the co-morbidity associated with an Asperger Syndrome diagnosis determines inclusion criteria. Analysis of the mix of Asperger Syndrome students with students who have other disabilities raises certain questions. Is the ratio of diagnosed to non-diagnosed students discernable to the teacher? If so, is the teacher able to teach children within the range of diagnoses? Can students who have medical needs be served given the mix of clinical issues? Is the student intelligence quotient a factor for inclusion or exclusion in the class?

Asperger Syndrome students are diagnosed within a normal to gifted intellectual range. Frequently, in our experience students with intelligence quotients of 70 or lower have an erroneous Asperger Syndrome diagnosis. The instructional methods and curricula for a student with an IQ of 70 are profoundly different than those for students with a 136 quotient.

Asperger Syndrome students do not perform well socially or academically in classes with students diagnosed with conduct disorders, disruptive, or aggressive behaviors. The Asperger Syndrome student is intimidated and/or exploited by students who are prone to victimize their more vulnerable peers.

Optimal. The absence of students who have below average IQ, conduct disorder, acting out – aggressive behavior is optimal for a student with an Asperger Syndrome diagnosis in the classroom.

Teacher-to-Student Ratio

The teacher-student ratio depends upon a number of variables such as type, size and kind of task, number of classroom distractions, clinical issues, and level of skill that the student is able to demonstrate. The range of options for instructional ratios also depends upon school resources. The optimal group size for general instruction is over three and under ten students. But within that range, it must be noted, that the preferred ratio is one-to-one when new information, instructional strategy, or novel application is to be taught.

Optimal. One-to-one tutorial instruction is best for the Asperger Syndrome student in the classroom.

Instructional Methods

It's informative to measure the social perceptions of Asperger Syndrome students because they are so often wrong. Given the complexity of human relationships and the uses and misuses of language, we can expect sometimes to deceive ourselves and to misread others. But not seventy percent of the time, as is observed in the social judgments of Asperger Syndrome students (DuCharme, 2003).

Their tendency to misread social cues makes Asperger Syndrome students particularly vulnerable to methods using collaboration. On the other hand, students can benefit from methods that are consistent, reliable, impersonal, individually paced, and interesting. Resistant learners and students who are interested and familiar with computer assisted instruction (CAI) benefit from the use of CAI.

The best methods for students with an Asperger Syndrome diagnosis are based on the individual's characteristics. The general characteristics of Asperger Syndrome students are also important. The significant identifying markers of Asperger Syndrome in current literature (Klin et al., 1995; Schopler et al., 1998; Frith, 1991) are:

1. absence of desire for social interaction and avoidance of social interaction; misperception of social cues

2. pragmatic deficits and decrease in competence with complex and abstract levels of language processing requirements; preference for picture cues and ideagrams

3. restricted, repetitive patterns of behavior

4. language processing difficulties and expressive language response latency

5. resistance to criticism and performance evaluation by teachers and others

6. sensory overload response to loud noise, too much verbal information, textual material with a "dense" level of content, unregulated pace of questioning, and short time interval in response requirement

7. negative responses to personal judgments of correct-incorrect performance

8. deficits in short term memory and recall of previously learned material

Optimal. The methodology that competes best with the issues listed above is academic task presentation through computer-assisted instruction (CAI). Such instruction provides:

- consistent format
- reliable mode and pace of presentation of tasks
- progressive increases in task complexity based on
- performance evidence
- rapid, contingent, correct-incorrect response feedback and scoring
- controlled learning pace
- impersonal presentation and assessment
- motivation based on interests of Asperger Syndrome students
- a controlled pace for reading text to the student

The computer-assisted tutorial format has been effective for hundreds of students over a twenty year period at TLC based on individual (single subject) performance reviewed weekly and quarterly as measured by an 80% criterion.

CAI is a flexible method that may be used in a tutorial format, in dyadic collaboration, or in small group collaboration under teacher direction. TLC staff have recorded daily performance in each type of instructional format for Asperger Syndrome with high degree, 80% or above, successes during repeated application.

CAI methods are more effective than teacher-directed, group discussions or self-regulated learning models for Asperger Syndrome students. The computer can correct spelling, present word choices, and assist with punctuation and organization. Further, help is cued by icons that support the Asperger Syndrome student's preference for visual systems. CAI methods can include assistive technology such as the reader-scanner, Alternative Learning System curricula, "Co-Writer", "Inspiration" and other text – CAI coordinated materials.

Interpersonal Style

The teacher's interpersonal styles are related to the student's success in the classroom. Observations of fifty different staff-student interactions over the past twenty-years suggests that the teacher's characteristics make a difference. Asperger Syndrome students appear to consistently benefit from teachers who are calm, clear, and positive in their communication.

"*Directness"* in communicating expectations and performance results avoids the problem of misunderstanding. "Directness" also decreases the need to revise messages, repeat directions, or correct student responses.

A *non-judgmental* approach to student behavior is helpful. Asperger students are observed to react negatively to being told what they do wrong. The focus on "what to do" rather than "what was done wrong" is most productive. The Asperger Syndrome student often seizes on the negative correction and perseverates. A calm, low-key personal demeanor appears to have a reassuring and calming effect on student behavior. The teacher who is precise, relevant to the student's interests, organized, and consistent has fewer problems with Asperger Syndrome students. Further, student productivity rises in non-judgmental settings.

The most effective teachers are those who focus on positive behavior and on behaviors that, if demonstrated by the student, will compete with or replace problem behaviors. Allowing negative or task-irrelevant behavior to occur is risky for both teacher and student. Learning a replacement behavior or corrective action is more difficult than practicing a correct response from the start.

Avoid correction, with an emphasis on what is incorrect or with review of the error and attention to why the answer is wrong, produces unintended outcomes and resistance to redirection.

Optimal. Much better, in our experience, is a "backward" chain task analysis. Demonstrate the correct answer, solution, or sequence of steps from the desired result to the first step. Provide the student with a model of the correct answer and then teach the components.

Task Design and Academic Risk

The complexity of the task and the requirements of answering a question
are variables that risk the student's success. Non-compliance and symptoms of perseveration, rigidity, oppositionality, and "anxiety" may be a response to a transition, especially if the transition is out of the ordinary routine and is not well rehearsed in advance.

Optimal. Take the needed time to rehearse the student by explaining the need for a transition. State precisely how and when the transition will be made. Allow sufficient time for rehearsal prior to the transition. Maintain continuity during rehearsal, the transition, and the completion of the transition. A staff "coach" should have the role to support transitions with rehearsal.

Before presenting a question the teacher should ask: What are the parts of a multi-level question? What is the cognitive level required by the vocabulary in the question? What is the student to infer that the answer requires? The cognitive "load" of the question is important and must fit the student's level of ability (Bloom, 1964). The structure of the question, the student's pre-assessed knowledge, and exposure to evaluation and judgment are risk factors to control and to gradually increase. Response modes available to the student may add or detract from risk. If a written response is required, and a time limit is placed on the answer, the risk is increased. If the student must read an answer aloud, additional risk is present. Certainly, Bloom's definitions of level one and level six items contain substantially different cognitive requirements.

Too much risk will prevent a student from demonstrating skills and abilities. The lack of an answer may not signify a lack of knowledge, but rather the student's inability to answer a question with the level of risk present. The manner in which the teacher enables the student to develop a tolerance for academic risk may vary. But the principle is the same: Taking academic risks is a skill and can be taught.

The teacher's level of sensitivity and creativity cannot be overestimated as an influence on the student's success. A teacher was observed speaking quietly, almost secretly, with a student who had a distressed look on his face. He stated that a scary movie about two girls would not leave his mind. The child said that he could not do his work. The teacher took an empty plastic container that had previously held a cookie and calmly said, "When the scary thought comes into your mind, then blow it into this box and cover it with the lid." The boy blew into the box and calmly reported to his teacher that, "It works!" He was very concerned when later that morning the lid fell from the box. He scurried to replace it.

Optimal. Control the level of academic risk in task design. When matching a teacher to a student with an Asperger Syndrome diagnosis, stress the importance of an organized, calm, reliable, and creative approach.

Classroom Routine

The standard expectation at TLC is that each student, given an appropriate task and curricula, will complete twenty-six graded assignments to a minimum standard of 80% correct each academic quarter. Academic performance is self-paced and governed by the completion of designated objectives, not by time spent in class.

Each student, with the teacher's help, establishes a daily schedule of academic subjects with time allotted and specific objectives for each subject. Academic performance is assessed by the end of each day, and a plan for the next day is started.

The number of assignments to be completed each day is recorded as well as the number of assignments that are incomplete and do not meet the 80% standard criterion. Higher level cognitive material requires a higher standard of 90%. The number of assignments and number of times assignments are redone to meet criteria is also recorded. The teacher adjusts the number of assignments per subject each day to ensure a practical expectation for performance. Assignments are adjusted according to ability level.

The student is given time in the schedule to select topics and tasks of interest. Opportunity for collaborative activity with selected peers and other adults is part of the student schedule. No homework is required other than reading or independent non-graded researches based on student interest. Note taking in class is rarely a requirement.

A balance is necessary between tutorial instruction and collaborative learning. Most important is the teacher's opportunity to schedule focused dialogues with each student. Talking about their writing, music, and art are important to students who are developing a pattern to externalize their thought and to consider the responses of others.

Optimal. TLC uses <u>all</u> the strategies and procedures described above with significant effect for Asperger Syndrome students.

Transitions

Transitions are defined as the changes in locations, attention, and responses to tasks that are required of a student.

An examination of transitions required by text books, work books, teachers' interpersonal styles, methods, and daily movements of people reveals hundreds of changes each day. If a child's symptom profile includes decreases in competencies and self-regulation during transitions, then we have probably created too many changes for the child. Programs with significant numbers and types of transitions are not easily negotiated.

Transitions in "performance" expectations on a single page of text may be too numerous for the student to handle. Attentional shifts required by changes in task demands or because of distractions, alter the Asperger Syndrome student's performance.

The teacher is advised to assess the degree of self-regulation expected of the student in the classroom. Expectations may change from one setting to another during and after transitions. Consider expectations of self-regulation along a continuum of supervision by staff, from continuous supervision to 90% supervision, then 80%, 70%, 50%, 25%, and finally none. The behavior of the student at different locations, during different activities, and at different times with different instructional groups will provide the data needed to select optimal levels of supervision.

Students have reported difficulty during physical education classes, particularly in locker rooms. At this time when the instructor is providing "privacy", the Asperger Syndrome student is most frequently victimized by teasing or aggression. The teacher must identify when maximum supervision is necessary.

Optimal. During transitions the teacher must provide 80 – 90% supervision unless the data indicates that it is not needed. The decision about the level of supervision is best made by direct staff observation during various activities at different times. Such decisions are not based solely on the student's report of incidents.

Non-compliance and symptoms of perseveration, rigidity, oppositionality, and "anxiety" may be a response to a request for a transition, especially when the transition is not well rehearsed. Teachers must take the time to rehearse the student by explaining the need for a transition and the steps to follow. Allow sufficient time prior to the transition for rehearsal, but maintain continuity in time from the rehearsal through the transition to its completion. A staff "coach" should have the role of easing transitions by necessary rehearsal.

Assessing Benefits to Students

An evidence-based intervention model typically utilized empirical data on each student's performance for the purpose of assessing instructional benefits. The data provides a stimulus for modifying services when performance measures indicate the need for changes. Continuous monitoring of each student's performance enables staff to assess the intended and unintended outcomes that result from changes of teacher, classroom, task, or medication.

In evidence-based instruction strategies based on empirically validated data is collected at specified intervals, using the various methods of recording. Frequency and percentage of occurrence of selected behaviors are charted and summarized in the form of quarterly reports. The data is then shared with administrators, educators, and clinical staff.

Evidence-based approaches provide opportunities to analyze the AS student's success with factors related to instruction, task organization, response formats, motivation, and feedback systems.

Conclusion

Asperger Syndrome is a life long condition. The effects of specific symptom manifestation at different developmental stages are important to identify because early identification of developmental difficulties facilitate early diagnosis and treatment. The corresponding treatment, environmental modification, education and medication adjustment to changing symptom profiles are important because Asperger Syndrome is not a static condition. As changes occur in the performance and abilities of the Asperger Syndrome individual, appropriate service and treatment options need to be available to the (Asperger Syndrome) individual and family.

Our current approaches to Asperger Syndrome lack a comprehensive life span view of treatment. The day-to-day, developmental stage, or academic year focus is too limited and tends to be reactive rather than proactive. There is enough current research to inform us that if we do not provide a comprehensive-long view approach, then the needed resources will most probably not be available to individuals because over time Asperger Syndrome individual's incorporate their symptoms into their pattern of behavior; i.e., symptoms become ego-syntonic.

The challenges associated with evidence-based treatment of Asperger Syndrome over the life-span are formidable. However, the evidence of effective intervention outcomes for Asperger Syndrome and other individuals with pervasive developmental delays makes it worthwhile to put forth the effort to meet these challenges.

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