AUTISM SPECTRUM DISORDERS : CONSTRUCTION OF A DIAGNOSTIC SCALE FOR SLPs

ADITI.C

Reg. No. M2K01

A Master's Dissertation submitted in part fulfillment for the
Second year M.Sc, (Speech and Hearing)
University of Mysore, Mysore.

ALL INDIA INSTITUTE OF SPEECH AND HEARING
MANASAGANGOTHRI, MYSORE - 570 006

MAY - 2002

Dedicated to....

.....Sharad,

"If I could reach up and
hold a star for every
instance that you stood by
me, the entire evening sky
would be in the palm of
my hand."

.....Ma and Daddy,
I am here today because of you.

CERTIFICATE

This is to certify that the dissertation entitled ***"AUTISM SPECTRUM DISORDERS : CONSTRUCTION OF A DIAGNOSTIC SCALE FOR SLPs"*** *is the bonafide work in part fulfillment for the degree of Master of Science (Speech and Hearing) of the student (Register No. M2K01).*

Director
All India Institute of Speech and Hearing
Mysore - 570 006

Mysore,
May, 2002

CERTIFICATE

*This is to certify that the dissertation entitled "**AUTISM SPECTRUM DISORDERS : CONSTRUCTION OF A DIAGNOSTIC SCALE FOR SLPs**" has been prepared under my supervision and guidance. It is also certified that this has not been submitted earlier in any other University for the award of any Diploma or Degree.*

Shyamala C.C.

Dr. SHYAMALA CHENGAPPA
Guide
Reader & Head,
Department of Speech Pathology
All India Institute of Speech and Hearing
Mysore - 570- 006

Mysore,
May, 2002

DECLARATION

This dissertation entitled ***"AUTISM SPECTRUM DISORDERS : CONSTRUCTION OF A DIAGNOSTIC SCALE FOR SLPs"*** *is the result of my own study under the guidance of* ***Dr. Shyamala Chengappa,*** *Reader & Head, Department of Speech Pathology, All India Institute of Speech and Hearing, Mysore, and has not been submitted earlier at any other University for the award of any Diploma or Degree.*

Mysore,
May, 2002

Reg. No. M2K01

ACKNOWLEDGEMENTS

My Heartfelt Gratitude to:

Shyamala ma'am: *Your faith in me has helped me come this far…Thanks a Million, ma'am- You ignited my passion for Language!*

Dr.M.Jayaram, *Director, AIISH, for permitting me to carry out this study.*

Ma, Daddy, Akshay*…You were always there beside me, pushing me to go on when I thought I couldn't. My confidence stems from your unshakeable faith in my Abilities…*

Sharad*…I'm bereft of words… for all the love, friendship and compassion – thru' thick and thin… I thank my stars for giving me You!!!*

Puru*…" Buddhu!!" The past months and the moments shared with you will remain among my most treasured memories – Thank God for You, or I'd have been convinced that I was a Freak!!!!*

Gupta*…Yes, Mr. J.I…We've come a LO…NG way in the last one year, Thanks for being there!*

Anjana, Sona*…You guys have been so much a part of my life this year…we've made wonderful memories…here's to us!!!*

Dear Alfina *Thanks for sitting into the night with me!*

Goswami Sir*…I wish you were still here…Maybe I'd have finished sooner…!!!*

Anna...We've had our differences, but PDDs still bind us together...here's to all those times we spent fantasizing 'bout our projects...This is IT!!! In PRINT!!!

To **Softouch** *for making my dissertation a reality in print.*

II M.Sc.s (2002)...it would have been an incomplete jigsaw puzzle without you guys...you all have your own rough edges, but you sure have a special place in my Life!!!

Dear God...You see me through, every time, and I thank you again...

TABLE OF CONTENTS

INTRODUCTION

INTRODUCTION

There is no enigma like the mind. The normal mind functions at the speed of light, in a multitude of directions, and yet, there are certain shadows that are never dissolved by light, and remain a deep mystery, as when presented by a disordered human mind.

Autism, a disorder first accounted in the mid - 20th century (Kanner, 1943, cited in Volkmar, 1998) was initially speculated to be a result of a disordered mind. The term has now, with extensive and intensive research, acquired myriad dimensions (the mind being only one of them), and belongs to a new genre of disorders of which it is considered the most cardinal member.

A substantial body of research has established the validity of autism as a diagnostic concept. For e.g. On the basis of its characteristic clinical features and course. (Volkmar, 1998). Recent attention has focused on mechanisms in Autism as well as on the spectrum of conditions which share some similarities with Autism and which are now included in the category of Pervasive Developmental Disorders (PDD) / Autism Spectrum Disorders (ASD).

Interest in what are now recognized as ASD can be traced back to the middle of the nineteenth century with the first descriptions of childhood 'Psychoses' (Volkmar, 1996). This interest stemmed from an increasing awareness of the importance of the factors of both experience and endowment in child development. Early descriptions of childhood "insanity" were followed by descriptions of childhood schizophrenia (DeSanctis, 1906, cited in Volkmar, 1998). The latter term became synonymous with all forms of severe mental disorder in children (Volkmar, 1998). The particular genius of Leo Kanner was reflected in his description in 1943 of the syndrome of infantile autism, which he initially believed to be quite different from forms of "psychosis" then recognized in children. In the subsequent decades autism has been the focus of considerable interest from clinicians and researchers alike. Some of the conditions included in the PDD category, such as Asperger's and Rett's syndromes, were proposed after Kanner's classic description of autism, whereas others, notably childhood disintegrative disorder were proposed many years before Kanner's work. (Volkmar, 1998).

The Pervasive Developmental Disorders are a phenomenologically related set of neuropsychiatric disorders, characterized by patterns of both delay and deviance in multiple areas of development, their onset typically in the first months of life (Volkmar and Lord, 1998). The term "PDDs" first came into

usage in the 1980s, to describe a class of disorders, which essentially have in common the following characteristics (Mauk, 1993):

- Impairments in social interaction
- Impairments in verbal and nonverbal communication
- Impairments in imaginative activity
- Limited number of interests, and repetitive activities.

According to the definition set forth in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) (APA, 1994), Pervasive Development Disorders are characterized by severe and pervasive impairment in several areas of development:

- Social interaction skills;
- Communication skills; or
- The presence of stereotyped behaviors, interests and activities.

So far, while the validity of autism has been relatively well-established issues regarding syndrome-boundaries remain the topic of some debate (Volkmar, 1998).

The assessment of the characteristic features in ASD / PDDS, and of particular deficits in psychological development and functioning, using appropriate scales and tests is indispensable to complete the diagnosis, to

determine the severity of the disorder and to work out an individual plan of therapy. (Barthelemy & Lelord, 1991, cited in Adrian et al, 2001).

Various classificatory systems have evolved over the years, the most popularly used being DSM and ICD. The intent behind these systems is that the diagnostic criteria *not* be used as a checklist, but rather as guidelines for diagnosing the disorders - in this context being the PDDs (Boyle, 1995, cited in Volkmar, 1998). There are few clearly established guidelines/ tools for measuring the severity of a person's symptoms. Therefore, the line between autism and the other PDDs is often blurred. (Boyle, 1995, cited in Volkmar, 1998).

The more studies that are conducted into questions of diagnosis, the stronger becomes the impression that difficulties in recognizing the boundaries of Autism are not solely a consequence of the subjective and elusive nature of the symptoms; rather, it seems that we are dealing with a disorder that has no clear boundaries (Bishop, 1989). Wing (1980) has argued that rather than thinking rigidly in terms of a discrete syndrome of autism, we should be aware that there is a continuum of autistic disorders. She regards social impairment as the core symptom of disorders. Children with this social impairment are characterized by a triad of deficits in social recognition, social communication and social under

standing. In each of these domains a wide range of severity of impairments is recognized.

In talking of an autistic continuum a single dimension is implied, in which a condition such as Asperger's disorder constitutes a milder form of the same underlying disorder that is seen in autism.

The concept of a precise diagnosis derives from a medical model in which specific disease processes can be identified: such precision is nearly impossible in describing children's psycho-educational difficulties and needs. (Shea & Mesibov, 1985). There has been much criticism of the "medical model" approach to developmental disorders, since once a label is attached to a child, we are likely to have stereotyped expectations and lose sight of his/her individuality (Bishop, 1989).

However real th ough these drawbacks are, we abandon diagnostic labels at our own peril. Without them we have no means of planning for treatment or to give a prognosis. Labels should be regarded as a useful way of summarizing information; it must be kept in mind that labels arise from an evaluation of symptoms and cannot be used vice-versa, i.e. to presume the symptoms of the individual (Bishop, 1989).

Hence the ever prevailing tussle between labeling and descriptive profiling of these disorders (Bishop, 1989) along with the changing perspectives of autism / ASD as being on a spectrum rather than discrete entities (Aarons and Gittens, 1992) indicates the need for a diagnostic system which serves a two fold function of being able to discretely evaluate an individuals symptoms as well as to show how and where the individual is situated on the PDD spectrum.

Hence this study endeavors to develop a diagnostic scale for Autism Spectrum disorders which (1) helps in the identification and diagnosis of these disorders, and (2) allows for profiling of children who cannot be definitively labeled, but show a spread of symptoms across subcategories.

REVIEW OF LITERATURE

REVIEW OF LITERATURE

This study was carried out following a detailed review of the literature pertaining to the diagnostic concepts related to Autism Spectrum Disorders. The review traces diagnostic developments right from the Kannerian Period up until what it is today.

Development of the Concept of Autism

Kanner's Account of the Syndrome

In Kanner's (1943, cited in Volkmar, 1998)) first account of autism, he stated that the condition he described "differs markedly and uniquely from anything reported so far". In this paper, he did not attempt to specify strictly defined diagnostic criteria, but presented detailed case histories of eight boys and three girls, noting the following characteristic features.

1. Inability to relate to people, including members of own family, from the beginning of life.
2. Failure to develop speech, or abnormal / largely non-communicative use of language in those who did speak. Pronoun reversal was observed in all children who could speak (eight cases), and echolalia, obsessive questioning and ritualistic use of language in several of them.

3. Abnormal responses to environmental objects and events, such as food, loud noises moving objects. Kanner viewed the child's behavior as governed by an anxiously obsessive desire for the maintenance of sameness, which led to a limitation in the variety of spontaneous activity.
4. Good cognitive potential with excellent rote memory and normal performance on the non-verbal Seguin Form Board test.
5. Normal physical status. Several children were clumsy in gait but all had good fine-muscle coordination.

Many psychiatrists found that the clinical picture described by Kanner fitted puzzling cases they had observed in their own clinics, but progress in documenting and understanding autism did not follow smoothly. Kanner (1965) (cited in Bishop, 1989) complained of two related trends in child psychiatry. Some child psychiatrists did not accept that autism was a distinctive syndrome, and suggested it was fruitless to draw sharp dividing boundaries between autism and other types of atypical development. Others accepted that autism was a syndrome, but applied this fashionable diagnosis far too widely. Wing (1976) noted that yet others interpreted Kanner's summary of the features of his syndrome far too narrowly, so that autism would not be diagnosed unless the child showed no sign of awareness of other people, despite the fact that none of Kanner's own cases was this severely impaired.

Specification of Diagnostic Criteria

Rutter (1978a)(cited in Bishop, 1989) documented the chaos that reigned for some years after Kanner's early report, with a wealth of terminology being applied inconsistently to children who has some or all of the clinical features of Kanner's early cases.

Rutter discussed the question of how far autism could be regarded as a syndrome and how it related to other conditions. He concluded that, although there were still many unsettled questions, in order to avoid ambiguity, investigators should adopt the following criteria in relation to behavior before 5 years of age to define childhood autism:

1. Onset before the age of 30 months.
2. Impaired social development, which has a number of special characteristics and is out of keeping with the child's intellectual development.
3. Delayed and deviant language development, which also has certain defined features, and which is out of keeping with the child's intellectual level.
4. Insistence on sameness, as shown by stereotyped play patterns, abnormal preoccupations or resistance to change.

Rutter noted that these diagnostic criteria left many unresolved issues, in particular the question of whether there were distinct subtypes of autism, and how to classify children who showed some but not all of the features of autism.

Variability in the interpretation of diagnostic criteria

The clarification of diagnostic criteria was widely welcomed as a step forward in enabling researchers to select children with common characteristics and to communicate with one another with some confidence that the same condition was being referred to. Nevertheless, points of difficulty remained when trying to apply them. The first was that the language used to describe symptoms requires subjective interpretation. To achieve greater consistency in diagnosis, it is crucial that we distinguish between abnormalities that must be present for a diagnosis of autism to be made, and behaviors that are characteristic, but not invariable features of autism.

Also, quite apart from problems in deciding what behavior constitute necessary and sufficient diagnostic features, disagreements may arise when there is a failure to appreciate how the clinical picture may change with age.

A number of studies have emphasized the variability of symptoms in children with Autism (Wing, 1978; Chengappa & Indu, 1991, Volkmar & Lord, 1998, cited in Volkmar, 1998). This is a central factor of consideration in this study, as the efficacy of any diagnostic system for Autism Spectrum Disorders rests on to what extent it can account the range of symptoms encountered.

The Borderlands of Autism

A major result of the evolutionary process of diagnosis, of the appearance of different sets of diagnostic criteria, and of different motives of diagnosis (Research, clinical, etc.), is that the diagnosis was not applied in a consistent manner. This has resulted in a tremendously heterogeneous population of Autistic children, which is probably why we today view "them" as Autism Spectrum Disorders (Schreibman, 1988)

Three reasons for lack of agreement over the diagnosis of autism have been considered: use of different diagnostic criteria, subjectivity of the symptoms used as diagnostic criteria and changes in the clinical picture with age (Bishop, 1989). Recognition of these difficulties and attempts to overcome them have undoubtedly led to much greater consensus in how the diagnostic label is applied. However, although specification of clear-cut diagnostic criteria has made it easier for different observers to agree on which children are autistic, we are left with the problem of how to classify the child who is clearly abnormal, has some autistic characteristics, yet does not meet the criteria for autism or any other disorder. There is no doubt that such children exist. Virtually every symptom characteristic of autism can be observed in children who do not fit this diagnostic category (Rutter, 1966; Bishop, 1989).

It has, hence, been argued that rather than thinking in terms of rigid diagnostic categories, we should recognize that the core syndrome of autism shades into other milder forms of disorder in which language or non-verbal behavior may be disproportionately impaired (as discussed in the previous chapter).

Of the various labels that have been suggested, the one that is most comprehensive and non-controversial is "Autistic Spectrum Disorder" (Rimland, 1993). This term was first suggested by Wing and Gould in 1979. The advantages of this term are obvious. For one, it acknowledges that there is a range of problems and of subtypes, and it does not pretentiously claim to be based on knowledge that is not yet available to us (Rimland, 1993).

Categorical definition of autism

Diagnostic and Statistical Manual of Mental Disorders

In DSM-III (American Psychiatric Association, 1980), autism was accorded diagnostic status for the first time. This inclusion reflected the body of work on autism which had accumulated over the previous decade. In DSM-III, the condition, termed infantile autism, was included in a new class of disorders, the Pervasive Developmental Disorders (PDD). Several other conditions, including a separate category for childhood onset pervasive developmental disorder and another category, termed 'residual' autism, were included in this

class as well. Although the term PDD was rather cumbersome, it achieved relatively wide acceptance. The DSM-III definition of infantile autism was much influenced by Rutter's earlier work and emphasized the early onset of serious disturbances in social and communicative development and unusual patterns of environmental responsiveness. The recognition of autism in DSM-III was a major advance, as was the availability of an officially recognized definition of the condition.

In DSM-III-R, the term pervasive developmental disorders, was retained to describe the overarching diagnostic class to which autism was assigned. The problematic diagnostic concepts, e.g. childhood onset PDD and residual autism, were eliminated. The DSM-III-R definition was specifically designed to be more developmentally oriented and to be appropriate to the entire range of syndrome expression over both age and developmental level. This was reflected in the new name "Autistic Disorder" rather then the DSM-III term "Infantile Autism". DSM-III-R included more criteria and a polythetic definition; because of various concerns, age of onset was not included as an essential diagnostic features although age of onset could be specified. Criteria in DSM-III-R were arranged developmentally and grouped into three broad categories relating to : (1) Social development, (2) Communication and play , and (3) restricted activities and interests. This last category reflects the earlier concept of 'insistence on sameness' included in previous diagnostic schemes, e.g. Rutter (1978). For a

diagnosis of autism, an individual was required to exhibit at least eight of the sixteen criteria, with at least two from the social and one from each of the two remaining groups. In DSM-III-R, only autism and the sub threshold category PDD-NOS were included in the PDD class.

As a result of concerns about the DSM-III-R definition of autism and an awareness of the categories and criteria, a large multi-site field trial was undertaken for DSM-IV. This field trial (Volkmar et al., 1994) included ratings of nearly 1000 cases by over 100 clinicians of varying backgrounds and experience.

Although DSM-IV primarily focused on the definition of autism the results of the field trial also provided support for the inclusion of Rett's syndrome, childhood disintegrative disorders (Heller's Syndrome) and Asperger's syndrome in the PDD class in DSM-IV.

The International Classification of Diseases

The ICD-10 research definitions of autism and other pervasive developmental disorders are thus: For a diagnosis of autism, a total of at least six criteria (from impairments in social interaction, communication, and restricted interests and activities) is required, with at least two social impairment criteria present. By definition, the condition must have its onset before age 3 years and not be due to either Rett's syndrome or childhood disintegrative disorder.

The ICD-10 system provided separate clinical descriptions and research criteria. Major differences in both criteria for autism and disorders from previous diagnostic systems were noteworthy. The draft ICD-10 research definition included age of onset as an essential diagnostic feature and included more detailed and numerous criteria for autism. In addition, other disorders in the PDD class included Rett's syndrome, Asperger's syndrome, childhood disintegrative disorder (Heller's syndrome) and atypical autism, as well as the sub threshold PDD-NOS category (Rutter and Schopler, 1992).

Existing Diagnostic Tools

As an alternative, and sometimes as a complement to, categorical diagnoses / profiles, various diagnostic instruments, rating scales and diagnostic checklists have been devised relative to autism. The ability to quantify the severity of autism would be helpful both for research and clinical purposes (Lord, 1991, cited in Volkmar, 1998), however, such estimates become very complex because of the developmental nature of autism.

There are some important issues in the development and use of dimensional assessment tools. As individuals with autism are rarely amenable to direct interview, dimensional assessment instruments usually rely either on behavioral observation (in structured or unstructured situations) or parent or caregiver report.

This section includes a brief description of all the tools that were reviewed for this study.

The Childhood Autism Rating Scale (CARS)

The Treatment and Education of Autistic and Related Communication Handicapped Children (TEACCH) program staff in North Carolina, to formalize observations of the child's behavior throughout the day, developed the Childhood Autism Rating Scale (CARS) (Schopler, Reichler, De Vellis and Daly, 1980). This 15-item behavior-rating scale helps to identify children with autism and to distinguish them from developmentally disabled children who are not autistic. Brief, convenient, and suitable for use with any child older than two years of age, the CARS makes it much easier for clinicians and educators to recognize and classify autistic children. Developed over a 15-year period, with more than 1,500 cases, CARS includes items drawn from five prominent systems for diagnosing autism. Each item covers a particular characteristic, ability, or behavior. The items are classed under the following areas:

- Relating to people
- Body use
- Adaptation to change
- Listening response
- Verbal communication

After observing the child and examining relevant information from parent reports and other records, the examiner rates the child on each item. Using a seven-point scale, he / she indicates the degree to which the child's behavior in the given area deviates from that of a normal child of the same age. A total score is computed by summing the individual ratings on each of the 15 items. Children who score above a given point are categorized as autistic. In addition, scores falling within the autistic range can be divided into two categories: mild-to-moderate and severe.

The Gilliam Autism Rating Scale (GARS)

Designed for use by teachers, parents, and professionals, the Gilliam Autism Rating Scale (GARS) (Gilliam and James, 1995) helps to identify and diagnose autism in individuals of ages three through twenty-two years, and to estimate the severity of the problem. Items on the GARS are based on the definitions of autism adopted by the DSM-IV. The items are grouped into four subtests:

> stereotyped behaviors

> communication

> social interaction

> developmental disturbances.

The GARS has three core subtests that describe specific and measurable behaviors.

An optional subtest (Developmental Disturbances) allows parents to contribute data about their child's development during the first three years of life. Validity and reliability of the instrument are high. Coefficients of reliability (internal consistency, test-retest, and inter-scorer) for the subtests are all in the 0.80s and 0.90s. Behaviors are assessed using objective, frequency-based ratings. The entire scale can be completed in five to ten minutes by persons who have knowledge of the child's behavior or the greatest opportunity to observe him or her. Standard scores and percentiles are provided.

The results obtained from GARS allow the professional to discriminate between persons with autism and those with other behavioral disorder.

The Checklist for Autism in Toddlers (CHAT)

The Checklist for Autism in Toddlers (CHAT) is a screening instrument designed to detect core autistic features to enable treatment as early eighteen months. The most effective treatment currently available for autism is early educational intervention, beginning as soon as possible after a child's diagnosis. Unfortunately, intervention rarely begins before the age of three years because few autistic children are diagnosed before they reach preschool age. CHAT offers physicians a means of diagnosing autism in infancy so that educational programs can be started months or even years before most symptoms become obvious. According to the authors, "We stress that the CHAT should not be used

as a diagnostic instrument, but it can alert the primary health professional to the need for an expert" (Baron-Cohen, Allen and Gillberg, 1992).

This first study (Baron-Cohen, Allen, and Gillberg, 1992, cited in Volkmar, 1998) using the CHAT revealed that key psychological predictors of autism at thirty months are showing two or more of the following at eighteen months:

(a) Lack of pretend play,

(b) Lack of protodeclarative pointing,

(c) Lack of social interest,

(d) Lack of social play, and

(e) Lack of joint-attention.

The CHAT detected all four cases of autism in a total sample of 91 eighteen-month-old children. The authors recommend that if a child lacks any combination of these key types of behavior on examination at eighteen months, it makes good clinical sense to refer him or her for a diagnostic assessment by a specialist with expertise in autism.

A second study (Baron-Cohen, Cox, Baird, Swettenham, Nightingale, Morgan, Drew, and Charman, 1996, cited in Volkmar, 1998) concluded that "consistent failure of three key items from the CHAT at eighteen months of age

carries an 83.3 percent risk of autism, and this pattern of risk indicator is specific to autism when compared to other forms of developmental delay". In the second study, research data on 16,000 children suggested that children who failed three items on the CHAT are at high risk of being autistic. The items include protodeclarative pointing (pointing at an object to direct another person's attention to it - not to obtain the item, but simply to share an interest in it); gaze monitoring (turning to look in the same direction as an adult is looking); and pretend play.

The Autism Diagnostic Interview - Revised (ADI — R)

The Autism Diagnostic Interview - Revised (ADI - R) is a semi-structured, investigator-based interview for caregivers of children and adults for whom autism or pervasive developmental disorders is a possible diagnosis. Two studies (Lord, Rutter, LeCouteur, 1994; Lord, Pickles, McLennan, Rutter, Bregman, Folstein, Fombonne, Leboyer & Minshew, 1997) were conducted to assess the psychometric properties of the ADI - R. Reliability was tested among 10 autistic (mean age 48.9 months) and 10 mentally handicapped or language - impaired children (mean age 50.1 months), and validity was tested among an additional 15 autistic and 15 non-autistic children. Results indicated the ADI - R was a reliable and valid instrument for diagnosing autism in preschool children. Inter-rater reliability and internal consistency were good, and inter-class correlations were very high.

A standard diagnostic interview is conducted at home or in a clinic. The ADI-R is considered by some professionals in the field as a measure of high diagnostic accuracy. It takes several hours to administer and score. The ADI-R is recognized as one of the better-standardized instruments currently available for establishing a diagnosis of autism. It is a semi-structured interview administered to subjects' caregivers, which determines whether or not an individual meets the Diagnostic and Statistical Manual of Mental Disorders (3rd ed., revised) criteria for autism. The authors of the ADI-R plan to update the scoring procedure so it reflects DSM-IV criteria. The assessment begins with a home visit by a therapist who interviews the child's parents. A home visit provides a chance to meet the child and to get a sense of the parents' priorities. This interview may be scheduled as part of the in-clinic assessment (Rutter, Lord, and LeCouteur, 1990).

The Autistic Continuum

"The Autistic Continuum: An Assessment And Intervention Schedule" (Aarons and Gittens, 1987) consists of a Manual and a Schedule. Its aim is to provide a framework for gathering information relevant to the understanding of children with a spectrum of autistic or autistic-like difficulties. It enables the user to decide what to look at, how to interpret the information, and how to use it appropriately, so that teaching or therapy is realistic and relevant to the child's

needs. In addition the Schedule may be used to monitor progress and changes as the child develops.

The approach here underlines the fact that autism exists on a continuum, and is no longer regarded as a discrete disorder with clearly defined boundaries.

The basis of the Schedule is a conflation of developmental tests and assessments, which in the authors' experience have proved useful when working with children with autism. This means that, as a clinical or teaching tool, it can be used flexibly and as often as required.

This schedule comprises eight sections, one each on:

> General observations
> Attention control
> Sensory function
> Non-verbal symbolic function
> Concept formation
> Sequencing and rhythmic abilities
> Communication development
> Educational attainments and psychometric assessment.

The Behavior Function Inventory (BFI)

In order to assess particular disorders of psychological development and functioning in children with developmental disorders, this tool was developed by Adrien et al (2001), based on eleven neurophysiological functions, disorders of which are considered to contribute to the core autistic syndrome. The eleven functions are attention, perception, association, intention, motility, imitation, emotion, contact, communication, cognition and regulation.

The construction of the BFI was based on three clinical and methodological principles: to give a precise and clear definition of each characteristic behavior, to attribute an equal number of items to each function category, and to be easily applicable to clinical and research practice. If offers precise information of the functional symptomatology of autism, showing clear evidence of disordered areas of functioning.

The Asperger's Syndrome Diagnostic Interview (ASDI)

The interview was developed over several years on the basis of experience with several hundred patients with high-functioning autism spectrum disorders and 'Asperger's syndrome'. The authors compiled diagnostic criteria for Asperger's syndrome for the First International Conference on Asperger's Syndrome, which was held in London in 1988. These criteria were published a year later (Gillberg and Gillberg, 1989) and were followed by more detailed

operationalization and a diagnostic algorithm in 1991. The set of operationalized criteria was based on Asperger's first case histories (Asperger, 1944) and was gradually reworked so as to make them all fit the criteria (Gillberg, 1991). The six criteria comprise 20 different items (four 'social', three 'interests', two routines' five 'verbal and speech', five 'non-verbal communication' and one 'motor').

The diagnostic interview was then developed and designed to cover the 20 items. It is a relatively highly structured interview intended for use with informants who know the individual very well - and who knew them well when they were children. The first version comprised three possible ratings for each item (1 = does not apply, 2 = applies sometimes or somewhat, 3 = definitely applies) and was used to select typical cases for research (into which would be recruited only those with ratings of 3 for diagnostic items). In a later version, mostly used in clinical practice, ratings 2 and 3 were collapsed, so that only two ratings per item were possible, 0 to 1 (as used in present study).

Preliminary data (Gillberg et al, 2001) shows that the test has excellent inter-rater reliability and test-retest stability, and the validity appears to be relatively good.

The Autism Research Institute's Form E-2 Checklist

Rimland (1964) drafted a checklist designated "Form E-l" (E for experimental). Within a year the Form E-2 replaced E-l.

Form E-2 is designed for completion by the child's parents, and asks questions about the child's early development and about language and behavior through age five an a half. (According to Rimland (1964), after age five and a half, autistic children begin to change in many ways, so it is better to rely on behavior prior to that age.) Once a completed E-2 form is received from a parent or professional, the data is entered into our computer and a score is derived which tells the child's position to the continuum ranging from "classical autistic" at one end to "not autistic" on the other. Following this, a report is mailed to the sender.

A major purpose of this effort is to collect data for statistical analysis. As of June 1993, the Autism Research Institute has collected over 16,800 E-2 forms, completed by parents of autistic and possibly autistic children in over 50 countries (Form E-2 is available in eight languages).

The Australian Scale for Asperger's Syndrome

The Australian Scale for Asperger's Syndrome (ASAS) was designed to identify those children whose social and emotional behavior is within the abnormal range, in order to steer these children to an accurate diagnosis, which may include Asperger's Syndrome and differential diagnoses of Asperger's Syndrome. The ASAS is divided into five sections, which loosely correspond to the five broad categories of behavior identified by other researchers to identify Asperger's:

- Impairments in social/emotional areas
- Cognitive skill deficits
- Communication skill deficits
- Specific interests
- Motor clumsiness.

The first section, Social and Emotional Behavior, corresponds to the social-impairment subsections of each of the diagnostic criteria. Questions reflect specific behavioral features: lack of social and emotional reciprocity, avoidance of others, clumsy social approach, difficulty sensing feelings of others, inability to interact with peers, socially and emotionally inappropriate behavior, impairment of two-way interaction, lack of ability to understand and use social rules, and lack of empathy (DSM-IV, APA, 1994; Wing, 1981).

The second section, Cognitive Development, includes items relevant to concentration, reading interests, memory and imagination. Ability to concentrate on a specific area of interest but not on others has been included as a diagnostic indicator by DSM-IV and ICD-10. Ability for solitary imaginative play is included as important for diagnosis in the ASAS.

Communication skills, the third area of the questionnaire, have been noted to be impaired in each list of diagnostic criteria available. Also, the ASAS specifically examines unusual vocal tone, one-sided approach in conversation and literal interpretations. Pedantic, lengthy speech was found to discriminate between HFA and AS.

The fourth area, Specific Interests, includes the presence of narrow, circumscribed interests and a preference for routine and structure.

Lastly, Motor Clumsiness was included in the ASAS. Presence or absence of motor clumsiness is not regarded as a diagnostic feature by authors of diagnostic criteria for AS, however, in the only empirical study which has measured motor development in AS, Gillberg (1989) found motor development to be a major discriminator between autism and AS.

The Autistic Behaviour Composite Checklist and Profile

Developed by Riley (1984) as a tool to check for various aspects of Autistic features. This tool serves more as a checklist than a profile, since the items are brief and very specific. A rating scale is employed for responses, but the test does not specify how to rate the individual on the spectrum; instead it gives a categorical diagnosis of whether the individual is autistic or not. The main drawback of this tool is that it has not been adequately standardized across population. Hence apart from the review, it was not considered for the study.

As observed from the review of the existing state-of-the-art of diagnostics in Autism Spectrum Disorders, there are no currently existing tools that have been standardized to the Indian population, and that are being used. Diagnosis of ASD, as a trend in India, rests on parent/caregiver information, although detailed language evaluation (depending on the presence of verbal/non-verbal language) may later be done using standardized language tests. (This is strictly an observation, and is not meant as a generalization). Hence, there is a stringent need for a comprehensive diagnostic scale/profile, which can be standardized for use in the Indian context.

METHOD

As this study endeavors to construct a Diagnostic Scale for Autism Spectrum Disorders, the review constituted a vital part of the study. Based on the review, the following methods were employed.

Item Pooling

This step was carried out following a review of about 11 different assessment scales / tools / checklists. The items were pooled with the DSM-IV criteria for Autism spectrum Disorders as the backbone referent criteria.

As mentioned in the previous chapter, the tools that were reviewed were:

> *The childhood autism rating scale (CARS)*

> *The Gilliam Autism Rating Scale (GARS)*

> *The Checklist for Autism in Toddlers (CHAT)*

> *The Autism Diagnostic Interview - Revised (ADI- R)*

> *The Autistic Continuum*

> *The Behavior Function Inventory (BFI)*

> *The Asperger 's Syndrome Diagnostic Interview (ASDI)*

> *The Autism Research Institute's Form E-2 Checklist*

> *The Australian Scale for Asperger's Syndrome*

All the items were pooled from the above checklists under 4 areas, namely:

1: *Social Characteristics:*

 # 2: Behavioral characteristics:

 # 3: Cognitive skills

 # 4: Communication skills

After pooling, the items were screened for synonymy, and the synonymous items were merged to eliminate redundancy.

Finally, the items were distributed as follows:

DOMAINS	**NO. OF ITEMS**
# 1: Social Characteristics:	
Interpersonal Interaction	*17*
Play	*7*
# 2: Behavioral Characteristics:	
General	*14*
Adaptive	*9*
Motor	*10*
Sensory	*20*
#3: Cognitive Skills	*21*
# 4: Communication Skills	
Prelinguistic Skills	*19*
Non-Verbal Communication	*14*
Verbal Communication	*38*

Procedures

Phase -I

The items in the pool were subjected to content validation by 5 experts. The criteria for selection of these experts was that they should be holders of a Master's Degree in Speech-Language Pathology, and should have had experience in handling a minimum of 6 cases with ASD.

The experts were asked to rate each item on its relevance in measuring features of the ASD. They were told to rate items on a 5-point scale: 0 indicating least relevance, and 4 implying that the item is indispensable.

Items that were in 60 % agreement across experts, (i.e. same rating by at least 3 experts) were taken for the next phase, and the items that did not meet this criteria were dropped.

Phase - II

The items selected on the basis of Phase I were administered across a group of 20 subjects already diagnosed to be having Speech and Language Disorder with Autistic Features.

SUBJECTS : The subjects selected were of ages ranging from 3 to 7 years, and they had all been attending therapy for 3-6 months prior to the study.

In the administration of these items, the ordinal Likert scale was used to rate the presence of the symptom in each individual. Here:

0 implied almost never/No agreement

1 implied very rarely/Mild agreement

2 implied some times/50% agreement

3 implied often/Moderate agreement

4 implied almost always/Complete agreement

The scores on each item across the 20 subjects were tabulated under each sub-domain and subjected to appropriate statistical analysis.

Phase III

The items selected from Phase II were then incorporated and drawn up into the final checklist.

RESULTS

&

DISCUSSION

RESULTS AND DISCUSSION

This study was embarked on with the purpose of constructing a diagnostic scale for Autism Spectrum Disorders. Items crucial for the diagnosis of the same were selected following a detailed review. The methods described in the previous chapter aimed at sifting the items reviewed, and eliminating redundancy, while selecting the more pertinent and well-worded items. The results of the various stages carried out during the study are as follows:

Results of Phase I

All the items (in each sub-domain) that were in 60% agreement or above across experts, (i.e. received the same rating from at least 3 experts) were retained for phase II. Very few items were deleted in this phase.

1. Social Domain

Interpersonal interaction : 2 items were deleted, as the ratings received were not in 60% agreement.

The items that were deleted were:

a. Does he/she react when spoken to?

b. Does he/she have problems appreciating social cues?

The experts did not uniformly rate the above items, probably because both items are very broadly stated.

Play : None of the items were deleted from this sub-domain.

2. Cognitive domain

All the items in this domain showed uniformity in rating across experts.

3. Behavioural domain

General Behaviours : 2 items were rejected under this sub domain. These items were:

a. Did the child behave normally for a time before the abnormal behaviour began?

b. Is it possible to categorize the child as being hyperactive?

The non-uniformity in rating for both the above items can be explained by the fact that neither is a characteristic that is necessarily present in individuals with ASD (Volkmar &Lord, 1998, cited in Volkmar, 1998). Item (a) however, was included for phase II, since it is considered by DSM-IV (APA, 1994) to be a differentiating characteristic of childhood disintegrative disorder / Heller's syndrome.

Adaptive behaviours : None of the items were rejected in this sub domain.

Sensory behaviours : Only 1 item was rejected here, viz.:

a. Does the child show behaviour related to tactile self-stimulation?

The above item may have been difficult to rate on grounds of a difficulty in observations of the behaviours.

Motor behaviours : 2 items were rejected in this sub-domain

a. Presence of facial tics / grimaces: Not usually observed in children with ASD.
b. Good coordination in doing fine work with fingers / playing with small objects: There are two points of disagreement for this item - one being that fine motor coordination may usually be restricted to a single task, and is not otherwise observed. The other fallacy in the statement was found to be that children with ASD do not usually play with objects, small or large. They only handle the objects(Schreibman, 1988), wherein fine coordination is difficult to observe / monitor.

4. Communication Domain

Prelinguistic skills : None of the items rejected.

Non-verbal communication : One item was rejected.

a. Does the child see humour and laugh at a funny picture or scene?

This item was agreed upon as being redundant, since inappropriate emotional expression was already agreed upon in the 'General Behaviours' sub-domain.

Verbal communication : Here 3 items were rejected -

a. Vocalizes animal and machinery sounds an request: This item is difficult to observe in a child and while interviewing the parents, it is not likely that they would have attempted to try it on the child earlier, given his overall communication deficit.

b. Is there any characteristic about his / her voice that is peculiar?: Not a specifically worded item, difficult for the caregiver to answer confidently.

c. Tells own name when asked: - This has been disagreed upon, perhaps because response here is characteristically inconsistent and mostly absent. However, it must be noted here that other items related to naming have been given a uniform (albeit low) rating. This is perhaps because all the experts agreed upon the low degree of relevance of those items. Whereas for the above item, the relevance was not rated with as much certainty.

Hence for phase II, the item distribution was as follows:

1. Social Domain

Interpersonal interaction : 15

Play : 7

2. Cognitive Domain **: 21**

3. Behavioural Domain

General behaviour : 12

Adaptive :9

Sensory : 19

Motor :8

4. Communication Domain

Prelinguistic skills : 19

Non-verbal communication : 13

Verbal communication : 35

Results of Phase II

The scores obtained on each item (selected from phase I) of each sub - domain across the 2- subjects were statistically analyzed using the SPSS (version 7.5) software. An Item-Total Correlation Analysis was done for each sub-domain using Pearson's 2-tailed Product-Moment Coefficient of Correlation. Only the items which showed a significant correlation were selected from this phase. Both positive and negative correlation was seen, depending on whether the item was positively or negatively stated.

l.Social Domain

Interpersonal Interaction : In this sub-domain, 12 items showed a significant correlation to the total.

Positively correlated items -

- Does the child avoid eye contact?
- Does the child lack precision / appropriateness in expression of emotion?
- Is the child indifferent to the presence of others?
- Is the child often "in a shell", or so distant, that you cannot reach him?
- Does the child prefer to be alone?
- Does he have considerable difficulty interacting with peers?

Negatively correlated items -

- As an infant, did the child reach out to be picked up?
- As an infant, did the child acknowledge the presence of his parents?
- Does the Child display awareness in familiar situations?
- Does the child take interest in other children?
- Is he/she sensitive and affectionate?

Play*:* Here 6 items showed significant correlation.

Positively correlated items -

- Does the child lack initiative to play?
- Does he/she just mouth/feel/fiddle with the toy without actually playing with it?
- Does the child lack an understanding of how to play with other children?

Negatively correlated items -

- Does the child show creativity during play ?
- Does the child ever pretend while playing ?
- Does the child seem to know the various functions of objects while playing ?

2.Cognitive Domain: In this domain, a total of 12 items showed significant correlation.

Positively correlated items -

- Does the child usually not look at what he/she is doing?
- Does the child show an unusual degree of skill in a particular area?
- Does the child sometimes exhibit an uncannily good memory for tunes/jingles/catch-phrases, etc.?
- Does the child repeat rhythms correctly?

- Does the child only pay fleeting attention to you and remain highly distractible?
- Does the child painstakingly focus attention on very trivial details?

Negatively correlated items -

- Does the child recognize common objects?
- Is he/she able to match object-to-picture / picture-to-object?
- Can the child discriminate Same Vs Different objects/colours/shapes, etc.?
- Is he/she aware of degrees - more and less?
- Does the child comprehend referents, like prepositions or pronouns?
- Can he/she discriminate Left Vs Right?

3. Behavioural Domain

General Behaviours : Under this sub-domain, a total of 9 items showed significant correlation to the total.

Positively correlated items -

- Does the child engage in repetitive but aimless activities?
- Can his/her behaviour described as bizarre?
- Does the child engage in repetitive activities, which seem to require a degree of creativity, but with stereotyped outcome (such as drawing / building, etc.)?

- Does he/she have particular interests which border on obsessive?
- Does the child like gazing at certain objects with a repetitive movement, for e.g., fan, etc?
- Is the child fearful of certain sounds / people / strangers, etc.? .
- Is the child unusually aggressive to himself or to others?
- Does the child alternately demonstrate characteristics of hyperactivity and total inactivity?

Negatively correlated items -

- Does the child show any awareness of danger?

Adaptive behaviours : A total of 7 items showed significant correlation in this sub-domain.

Positively correlated items

- Does the child react adversely when interrupted in what he/she is doing?
- Is he/she unduly upset by changes in routine / environmental setting, etc.?
- Does he/she insist on music / T.V all the time?
- Does the child line things up in precise, evenly-spaced rows and insist they not be disturbed?
- Does the child have a pattern of interest which takes up so much of time that other activities are restricted, irrespective of urgency?

Negatively correlated items

- Is he/she able to generalize and adapt to new and variable situations?
- Does the child readily accept new personal articles (toys, clothes, etc.)?

Sensory Behaviours : A total of 11 items in this sub-domain showed significant correlation.

Positively correlated items

- Does the child exhibit a lack of sensitivity to low levels of pain?
- Is the child "look though" people as if they are not there?
- Is the child "deaf to some sounds, but hears other?
- Does the child have unusual cravings for things to eat / chew on?
- Does the child stare into space / at his fingers / at moving ants, etc?
- Does the child show auditory self-stimulation?
- Does he / she display an unusual degree of fear / distress due to certain sounds / touch / objects?

Negatively correlated items

- As an infant, did the child react to bright lights / colours / loud sounds, etc?
- Is the child able to fix his gaze and attend?
- Does the child recognize familiar voices?
- Does he / she recognize own name?

Motor behaviours : A total of 5 items significantly correlated with the total in this sub-domain.

Positively correlated items

- Does the child have a tendency to flap / rock when excited / distressed?
- Does the child whirl himself like a top?
- Does the child hold his hands in strong
- Does the child have an odd gait?

Negatively correlated items

- Does the child seem well-coordinated while running, walking, climbing, etc?

4. Communication Domain

Prelinguistic Skills : Under this sub-domain, 14 items were found to have significant correlation.

Positively correlated items

- Is the child mute (others than crying or some vocal sounds)?
- Does the child lack communication intent?

Negatively correlated items

- Does the child look at people when they talk to him / her?
- Does the child respond to name call?
- As an infant, was there differential babbling?
- Did the infant "reach out" for items of interest?
- Did the infant consistently cry to indicate needs?
- Did the infant engage in "turn-taking dialogue" with smiles and coos, etc?
- Does the child respond to facial expressions?
- Does the child respond to environmental sounds?
- Does the child imitate anyone?
- Does the child understand basic gestures like pointing/nodding?
- Does the child ask for desired objects with vocalizations / gestures?
- Does the child attend to others speech?

Nonverbal Communication *:* 8 items in this sub-domain showed significant correlation.

Positively significant correlation

- Does the child make limited use of gestures?
- Does the child have a stiff/ strange / peculiar gaze?
- Is the child's body language strong, unusual or clumsy?
- Does the child use another person like an instrument?

Negatively correlated items

- Does the child use his index finger to point and ask for something?
- Does the child attempt to communicate gesturally?
- Does he / she point to different objects when named?
- Did the child as an infant initiate communication for anything other than basic needs?

Verbal communication : This was the sub-domain with most number of items. Of these, 22 items showed significant correlation.

Positively correlated items

- Does the child show a total lack of meaningful speech, and instead have a persistent use of bizarre phrases?
- Is the child's vocabulary greatly out of proportion with his communication ability?
- Does the child repeat phrases / expressions (that he / she has heard before) in a parrot-like manner without situational relevance? (Echolalia)
- Is echolalia used for:
    - Sounds?
    - Tunes?
    - Intonation patterns?
    - Words?

- Phrases?
- Gestures?

- Is the child able to pronounce certain difficult words?
- Does the child only take literal interpretation of statements?
- Is the child's speech over-precise / pedantic?
- Does the child have problems repairing a conversation?
- Is the use of language highly stereotyped and concrete?
- Is the language content idiosyncratic, bizarre or obsessive ?
- Does the child seem to lack initiative to communicate verbally with peers / adults?

Negatively correlated items

- Can the child understand what is said to him?
  (Judging from his responses)
- When asked to look in a particular direction, does the child attempt to find and focus on the target?
- Can the child answer simple questions?
- Can the child name some common objects?
- Can the child name family members?
- Can the child carry out a simple series of 2 related commands?
- Does he / she appear to be interested in the other side of the conversation?

- Is echolalia ever used appropriately?Does he / she modify utterances before repeating them (mitigated echolalia)?
- Does the child use the personal pronoun?
- Is the child familiar with conversational rules like turn taking and listening?

Phase HI

The selected items (from phase II) were then drawn up into the final checklist (see Appendix I). The items were arranged in decreasing order of "relevance" as rated by the experts in Phase I.

The final scale was divided into 3 sections: Section I being for the item-checklist, Section II being for the clinician's profile of the case, and Section III being the scoring instructions. As a prologue to the scale, some instructions were included for the Evaluator.

This scale bears scope for both qualitative categorizations as well as for profiling of the symptoms, to account for a more thorough diagnosis. The items are scored on an ordinal scale, which is specified for the individual items. Among the various other scales reviewed, it was observed that they are either purely checklists, or symptom-scales, or profiles. This scale attempts to combine all the above properties to make for a more effective tool.

SUMMARY

&

CONCLUSION

SUMMARY & CONCLUSIONS

Autism Spectrum Disorders are a condition-class, which remain a mystery to speech-language pathologists all over the world even today - 8 decades after their discovery. Misconceptions regarding the disorders are still rampant, even after an ocean of research results and literature has been made available to the world.

We have come a long way since the Kannerian Era (1943), and we have so much information at are doorstep, that we have expended almost a couple of decades trying to organize and categorize this information.

In particular, the diagnosis of this class of disorder meets with much disagreement and controversy among various groups of experts. We might go as far as to place these experts in two distinct "Schools of Thought": One being that of precise, specific diagnostic labels, and the other adopting a more diffuse view of Autism as a continuum/spectrum of disorders, and not a specific set of criteria. This study has tried to take into consideration both these views, although it definitely advocates the latter.

This study is an attempt to shed light on the changing perspectives of Autism and its diagnosis, and make a humble contribution to the existing ocean of literature, by constructing a scale for the diagnosis and profiling of Autism Spectrum Disorders, for use by the Speech-Language Pathologist.

The study essentially aimed at the construction of a diagnostic scale that could qualify the nature of the ASD, and also make an allowance for the profiling of symptoms. The study was completed in various phases, following a detailed review of 9 prevalent diagnostic tools from all over the world. Items from all the reviewed checklists were taken and categorized into 4 domains: Social(including Interpersonal interactions and Play), Cognitive, Behavioural (including General, Adaptive, Sensory, and Motor behaviours), and Communication (inclusive of Prelinguistic, Nonverbal and Verbal sub domains). These items were then subjected to two stages of analysis: Content Validation by a panel of 5 experts, and Item-Total Correlation (using SPSS 7.5). Items were eliminated and selected after each stage, and finally incorporated into the diagnostic form, which was named "The Diagnostic Scale for Autism Spectrum Disorders". The final checklist comprises 3 sections: One for the actual checklist, one for the Profile, and one for scoring instructions. The scoring scale was different for different items, as specified in the form.

During the study, many technical difficulties were encountered, the primary one being the diversity of symptoms in cases labeled "Autistic". Also, all the subjects studied had undergone therapy for different durations, which might imply that they had moved along the spectrum since their first diagnosis. After so much intensive study, there is still the need to discover something concrete about this "Spectrum", of which we speak more or less in the abstract plane.

Limitations of Study

- The constructed tool has to be standardized across a larger population.
- Secondly, the scale is only a qualitative tool for the measurement of Autism Spectrum Disorders, although it attempts to quantify the severity of impairment.
- This scale does not define other entities (Asperger's Disorder, Childhood Disintegrative Disorder, and Rett's Disorder) on the spectrum.
- Various exemplary tools were reviewed for the study, however, the review was by no means exhaustive.

Implications for further Research

This study opens up some more avenues for research in the area of diagnostics itself.

- Further refinement of the constructed tool following standardization across a larger population.
- The scale can be standardized using subjects with confirmed diagnoses of Asperger's, Rett's, or Heller's syndromes, to validate its efficacy.
- The tool can also be used for baseline and post-therapy assessment.

APPENDICES

APPENDIX -1

THE DIAGNOSTIC SCALE FOR AUTISM SPECTRUM DISORDERS

Instructions to the Evaluator

- This form should be filled by the professional on the bases of both parent/caregiver report, and observation of the child.
- The responses have to be recorded according to the ordinal scale as specified after each item.
- Three scales have been specified, with scales A and B for each. These scales must be applied appropriately depending on the item specification (Superscripts ^{A} or ^{B};$^{\#}$, *, or none.)
- The score should finally be totaled separately for each sub-section of the form.
- In the spaces provided at the end of the form, a profile of each sub-domain should be entered (based on the subject's score in that particular sub-domain). This is meant to be a free-statement of the evaluator's observations.
- **Note:** The pronoun "He" has been used throughout in the form to refer to the case *for the sake of convenience only.*

SECTION -I

1. Social Domain

I. *Interpersonal Interaction*

a) [A] Does the child avoid eye contact? ☐

b) [A] Does the child lack precision/appropriateness in expression of emotion? * ☐

c) [A] Is the child indifferent to the presence of others? * ☐

d) [A] Is the child often "in a shell", or so distant, that you cannot reach him? ☐

e) [A] Does the child prefer to be alone? ☐

f) [A] Does he have considerable difficulty interacting with peers? * ☐

g) [A] Does he exhibit socially inappropriate behaviours? ☐

h) [B] As an infant, did the child reach out to be picked up? ☐

i) [B] As an infant, did the child acknowledge the presence of parents?* ☐

j) [B] Does he display social awareness in familiar situations? * ☐

k) [B] Does he take interest in other children? * ☐

1) [B] Is he affectionate? * ☐

2. Play

a) [A] Does the child lack initiative to play? * ☐

b) [A] Does he just mouth/feel/fiddle with toys instead of playing with them? ☐

c) [A] Does he lack an understanding of how to play with other children? ☐

d) [B] Does the child show creativity during play? * ☐

e) [B]Does the child ever pretend while playing? [#] ☐

f) [B]Does the child seem to know the various functions of objects while playing? * ☐

II. Cognitive Domain

a) [A]Does the child usually not look at what he is doing? ☐

b) [A]Does the child show an unusual degree of skill in a particular area? [#] ☐

c) [A]Does the child sometimes exhibit an uncannily good memory for tunes/jingles/catch-phrases, etc.? ☐

d) [A]Does the child repeat rhythms correctly? * ☐

e) [A]Does the child only pay fleeting attention to you and remain highly distractible? ☐

f) [A]Does the child painstakingly focus attention on very trivial details? * ☐

g) [B]Does the child recognize common objects? ☐

h) [B]Is he able to match object-to-picture / picture-to-object? [#] ☐

i) [B]Can the child discriminate Same Vs Different objects/colours/shapes, etc.? [#] ☐

j) [B]Is he aware of degrees - more and less? [#] ☐

k) [B]Does the child comprehend referents, like prepositions or pronouns? * ☐

1) [B]Can he discriminate Left Vs Right? [#] ☐

III. Behavioural Domain

I. *General Behaviours*

a) Does the child engage in repetitive but aimless activities? ☐

b) [A]Can his behaviour described as bizarre? ☐

c) [A]Does the child engage in repetitive activities, which seem to require a degree of creativity, but with stereotyped outcome (such as drawing / building, etc.)? ☐

d) [A]Does he have particular interests that border on obsessive? ☐

e) [A]Does the child like gazing at certain objects with a repetitive movement, for e.g., fan, etc? ☐

f) [A]Is the child fearful of certain sounds / people / strangers, etc.? ☐

g) [A]Is the child unusually aggressive to himself or to others? ☐

h) [A]Does the child alternately demonstrate characteristics of hyperactivity and total inactivity?[#] ☐

i) [B]Does the child show any awareness of danger? ☐

2. Adaptive behaviours

a) [A]Does the child react adversely when interrupted in what he/she is doing? * ☐

b) [A]Is he/she unduly upset by changes in routine / environmental setting, etc.? * ☐

c) [A]Does he/she insist on music / T.V all the time? ☐

d) [A]Does the child line things up in precise, evenly spaced rows and insist they not be disturbed? ☐

e) [A]Does the child have a pattern of interest, which takes up so much of time that other activities are restricted, irrespective of urgency? [#] ☐

f) [B]Is he able to generalize and adapt to new and variable situations? * ☐

g) [B]Does the child readily accept new personal articles (toys, clothes, etc.)? ☐

3. Sensory Behaviours

a) [A]Does thechild exhibit a lack of sensitivity to low levels of pain? * ☐

b) [A]Does the child "look though" people as if they are not there? ☐

c) [A]Is the child "deaf to some sounds, but hears other? ☐

d) [A]Does the child have unusual cravings for things to eat / chew on? ☐

e) [A]Does the child stare into space / at his fingers / at moving ants, etc? ☐

f) [A]Does the child show auditory self-stimulation? ☐

g) [A]Does he / she display an unusual degree of fear / distress due to certain sounds / touch / objects? ☐

h) [B]As an infant, did the child react to bright lights / colours / loud sounds, etc? ☐

i) [B]Is the child able to fix his gaze and attend? * ☐

j) [B]Does the child recognize familiar voices? ☐

k) [B]Does he recognize own name? ☐

4. Motor behaviours

a) [A] Does the child have a tendency to flap / rock when excited / distressed? ☐

b) [A] Does the child whirl himself like a top? ☐

c) [A] Does the child hold his hands in strange positions? ☐

d) [A] Does the child have an odd gait? *

e) [B] Does the child seem well coordinated while running, walking, climbing, etc?*

IV.Communication Domain

1. Prelinguistic Skills

a) [A]Is the child mute (others than crying or some vocal sounds)? [#]

b) [A]Does the child lack communication intent?

c) Does the child look at people when they talk to him / her?

d) [B]Does the child respond to name call?

e) [B]As an infant, was there differential babbling? [#]

f) [B]Did the infant "reach out" for items of interest?

g) [B]Did the infant consistently cry to indicate needs?

h) [B]Did the infant engage in "turn-taking dialogue" with smiles and coos, etc?

i) [B]Does the child respond to facial expressions?

j) [B]Does the child respond to environmental sounds?

k) [B]Does the child imitate anyone? [#]

1) [B]Does the child understand basic gestures like pointing/nodding?

m) [B]Does the child ask for desired objects with vocalizations / gestures?

n) [B]Does the child attend to others speech? *

2. Nonverbal Communication

a) [A]Does the child have a stiff/ strange / peculiar gaze? ☐

b) [A]Is the child's body language strange, unusual or clumsy?[#] ☐

c) [A]Does the child use another person like an instrument? ☐

d) [B]Does the child use his index finger to point and ask for something? ☐

e) [B]Does the child attempt to communicate gesturally? ☐

f) [B]Does he point to different objects when named? [#] ☐

g) [B]Did the child as an infant initiate communication for anything other than basic needs? ☐

3. Verbal communication

a) [A]Does the child show a total lack of meaningful speech, and instead have a persistent use of bizarre phrases? ☐

b) [A]Is the child's vocabulary greatly out of proportion with his communication ability?[#] ☐

c) [A]Does the child repeat phrases / expressions (that he / she has heard before) in a parrot-like manner without siruational relevance? (Echolalia) ☐

d) [A]Is echolalia used for:[#]

- Sounds? ☐
- Tunes? ☐
- Intonation patterns? ☐
- Words? ☐
- Phrases? ☐
- Gestures? ☐

e) [A]Is the child able to pronounce certain difficult words? ☐

f) [A]Does the child only take literal interpretation of statements?[#] ☐

g) [A]Is the child's speech over-precise / pedantic? * ☐

h) [A]Does the child have problems repairing a conversation? ☐

i) Is the use of language highly stereotyped and concrete? * ☐

j) [A]Is the language content idiosyncratic, bizarre or obsessive? * ☐

k) [A]Does the child seem to lack initiative to communicate verbally with peers / adults? ☐

1) [B]Can the child understand what is said to him? (Judging from his responses) ☐

m) [B]When asked to look in a particular direction, does the child attempt to find and focus on the target? ☐

n) [B]Can the child answer simple questions?[#] ☐

o) [B]Can the child name some common objects?[#] ☐

p) [B]Can the child name family members?[#] ☐

q) [B]Can the child carry out a simple series of 2 related commands?[#] ☐

r) [B]Does he / she appear to be interested in the other side of the conversation? ☐

s) [B]Is echolalia ever used appropriately? ☐

t) [B]Does he / she modify utterances before repeating them (mitigated echolalia)? ☐

u) [B]Does the child use the personal pronoun? ☐

v) [B]Is the child familiar with conversational rules like turn taking and listening?* ☐

SECTION - II

PROFILE

I. Social Domain

/. *Interpersonal Interactions*

2. Play

II. Cognitive Domain

III. Behaviour Domain

1.. *General Behaviours*

2. Adaptive Behaviours

3. Sensory Behaviours

4. Motor Behaviours

IV. Communication Domain

1. Prelinguistic Skills

2. Nonverbal Communication

3. Verbal Communication

SECTION - III

SCORING

- Items are to be scored on a 5-point scale; from 0 to 4.
- The scale to be used for each item is indicated against the items. Superscripts *, # and Nil indicate the scale to be applied, and superscripts A and B indicate the direction of the scale

  For most items, the scoring is thus:

A	*B*
0 => Almost Never	0 => Almost Always
1 => Very Rarely	1 => Often / Most of the time
2 => Sometimes	2 => Sometimes
3 => Often / Most of the time	3 => Very Rarely
4 => Almost Always	4 => Almost Never

  For other items*, scoring is thus:

A	*B*
0 => No	0 => Yes
1 => To a slight extent	1 => To a great extent
2 => To some extent	2 => To some extent
3 => To a great extent	3 => To a slight extent
4 => Yes	4 => No

- For yet other items , a polar scale has to be applied, i.e. Yes or No.

A	*B*
0 => No	0 => Yes
4 => Yes	4 => No

- The scores should be totaled for each sub domain.
- A profile for each sub domain should be filled in the space provided in the form.
- The domain may be graded as Mild, Mild-Moderate, Moderate, Moderate-Severe, and Severe Impairment, depending on the scores in each domain.
- The score break-ups are:

Social:	0-14: Mild
	15-29: Mild-Moderate
	30-44: Moderate
	45 - 59: Moderate-Severe
	60-72: Severe

Cognitive:	0-9: Mild
	10-19: Mild-Moderate
	20-29: Moderate
	30 - 39: Moderate-Severe
	40-48: Severe

Behavioural:	0-25: Mild
	26 - 50: Mild-Moderate
	51-75: Moderate
	76 - 104: Moderate-Severe
	105-128: Severe
Communication*:*	
Prelinguistic	0-11: Mild
	12-22: Mild-Moderate
	23-33: Moderate
	34-44: Moderate-Severe
	45 - 56: Severe
Nonverbal	0-6: Mild
	7-12: Mild-Moderate
	13- 18: Moderate
	19-25: Moderate-Severe
	26-32: Severe
Verbal	0-17: Mild
	18-34: Mild-Moderate
	35-52: Moderate
	53 - 69: Moderate-Severe
	70-88: Severe

APPENDIX - II

DSM-IV (TR) (APA, 2000) CLASSIFICATION OF PERVASIVE DEVELOPMENTAL DISORDERS

Diagnostic Criteria for 299.00 Autistic Disorder

A. A total of six (or more) items from (1), (2), and (3), with at least two from (I), and one each from (2) and (3):

1. Qualitative impairment in social interaction, as manifested by at least two of the following:

    a. Marked impairment in the use of multiple nonverbal behaviors such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction.

    b. Failure to develop peer relationships appropriate to developmental level.

    c. A lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g., by a lack of showing, bringing, or pointing out objects of interest).

    d. Lack of social or emotional reciprocity.

2. Qualitative impairments in communication as manifested by at least one of the following:

    a. Delay in, or total lack of, the development of spoken language (not accompanied by an attempt to compensate

through alternative modes of communication such as gesture or mime) in individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others.

b. Stereotyped and repetitive use of language or idiosyncratic language.

c. Lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level.

d. Restricted repetitive and stereotyped patterns of behavior, interests, and activities, as manifested by at least one of the following:

e. Encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus.

f. Apparently inflexible adherence to specific, nonfunctional routines or rituals stereotyped and repetitive motor manners (e.g., hand or finger flapping or twisting, or complex whole-body movements).

g. Persistent preoccupation with parts of objects

3. Delays or abnormal functioning in at least one of the following areas, with onset prior to age 3 years: (1) social interaction, (2)

language as used in social communication, or (3) symbolic or imaginative play.

4. The disturbance is not better accounted for by Rett's Disorder or Childhood Disintegrative Disorder.

Diagnostic Criteria for 299.80 Rett's Disorder

A. All of the following:

1. Apparently normal prenatal and perinatal development
2. Apparently normal psychomotor development through the first 5 months after birth
3. Normal head circumference at birth

B. Onset of all of the following after the period of normal development:

1. Deceleration of head growth between ages 5 and 48 months
2. Loss of previously acquired purposeful hand skills between 5 and 30 months with the subsequent development of stereotyped hand movements (e.g., hand-wringing or hand washing)
3. Loss of social engagement early in the course (although often social interaction develops later)
4. Appearance of poorly coordinated gait or trunk movements
5. Severely impaired expressive and receptive language development with severe psychomotor retardation .

Diagnostic Criteria for 299.10 Childhood Disintegrative Disorder

A. Apparently normal development for at least the first 2 years after birth as manifested by the presence of age-appropriate verbal and nonverbal communication, social relationships, play, and adaptive behavior.

B. Clinically significant loss of previously acquired skills (before age 10 years) in at least two of the following areas:

    1. Expressive or receptive language
    2. Social skills or adaptive behavior
    3. Bowel or bladder control
    4. Play
    5. Motor skills

C. Abnormalities of functioning in at least two of the following areas:

    1. Qualitative impairment in social interaction (e.g., impairment in nonverbal behaviors, failure to develop peer relationships, lack of social or emotional reciprocity).
    2. Qualitative impairments in communication (e.g., delay or lack of spoken language, inability to initiate or sustain a conversation, stereotyped and repetitive use of language, lack of varied make-believe play).
    3. Restricted, repetitive, and stereotyped patterns of behavior, interest, and activities, including motor stereotypes and mannerisms.

D. The disturbance is not better accounted for by another specific Pervasive Developmental Disorder or by Schizophrenia.

Diagnostic Criteria for 299.80 Asperger's Disorder

A. Qualitative impairment in social interaction, as manifested by at least two of the following:

1. Marked impairment in the use of multiple nonverbal behaviors such as eye-to eye gaze, facial expression, body postures, and gestures to regulate social interaction.
2. Failure to develop peer relationships appropriate to developmental level.
3. A lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g., by a lack of showing, bringing, or pointing out objects of interest to other people).
4. Lack of social or emotional reciprocity.

B. Restricted repetitive and stereotyped patterns of behavior, interests and activities, as manifested by at least one of the following:

1. Encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity of focus.
2. Apparently inflexible adherence to specific, nonfunctional routines or rituals.

3. Stereotyped and repetitive motor mannerisms (e.g., hand or finger flapping or twisting, or complex whole-body movements).
4. Persistent preoccupation with parts of objects.

C. The disturbance causes clinically significant impairment in social, occupational, or other important areas of functioning.

D. There is no clinically significant general delay in language (e.g., single words used by age 2 years, communicative phrases used by age 3 years).

E. There is no clinically significant delay in cognitive development or in the development of age-appropriate self-help skills, adaptive behavior (other than in social interaction), and curiosity about the environment in childhood.

F. Criteria are not met for another specific Pervasive Developmental Disorder or Schizophrenia.

299.80 Pervasive Developmental Disorder Not Otherwise Specified (Including Atypical Autism)

This category should be used when there is a severe and pervasive impairment in the development of reciprocal social interaction associated with impairment in either verbal or nonverbal communication skills or with the presence of stereotyped behavior, interests, and activities, but the criteria are not met for a specific Pervasive Developmental Disorder, Schizophrenia, Schizotypal Personality Disorder, or Avoidant Personality Disorder. For example, this

category includes "atypical autism" - presentations that do not meet the criteria for Autistic Disorder because of late age at onset, atypical symptomatology, or sub threshold symptomatology, or all of these.

APPENDIX-III

THE ICD-10 (WHO, 1996)CLASSIFICATION OF PERVASIVE DEVELOPMENTAL DISORDERS

The definitions and dialog below is the taken from ICD-10 Chapter V, which is the chapter for mental and behavioural disorders. It is titled "The ICD-10 Classification of Mental and Behavioural Disorders - Clinical descriptions and diagnostic guidelines" and the following is taken from pages 252-259.

Now on to the definitions of PDD as listed in ICD-10:

F84 Pervasive developmental disorders

This group of disorders is characterized by qualitative abnormalities in reciprocal social interactions and in patterns of communications, and by restricted, stereotyped, repetitive repertoire of interests and activities. These qualitative abnormalities are a pervasive feature of the individual's functioning in all situations, although they may vary in degree. In most cases, development is abnormal from infancy and, with only a few exceptions, the conditions become manifest during the first 5 years of life. It is usual, but not invariable, for there to be some degree of general cognitive impairment but the disorders are defined in terms of *behaviour* that is deviant in relation to mental age (whether the individual is retarded or not). There is some disagreement on the subdivision of this overall group of pervasive developmental disorders.

In some cases the disorders are associated with, and presumably due to, some medical condition, of which infantile spasms, congenital rubella, tuberous sclerosis, cerebral lipidosis, and the fragile X chromosome anomaly are among the most common. However, the disorder should be diagnosed on the basis of the behavioural features, irrespective of the presence or absence of any associated medical conditions; any such associated condition must, nevertheless, be separately coded. If mental retardation is present, it is important that it too should be separately coded, under F70-F79, because it is not a universal feature of the pervasive developmental disorders.

F84.0 Childhood autism

A pervasive developmental disorder defined by the presence of abnormal and/or impaired development that is manifest before the age of 3 years, and by the characteristic type of abnormal functioning in all three areas of social interaction, communications, and restricted, repetitive behaviour. The disorder occurs in boys three to four times more often than in girls.

Diagnostic guidelines

Usually there is no prior period of unequivocally normal development but, if there is, abnormalities become apparent before the age of 3 years. There are always qualitative impairments in reciprocal social interaction. These take the form of an inadequate appreciation of socio-emotional cues, as shown by a lack

of responses to other people's emotions and/or a lack of modulation of behaviour according to social context; poor use of social signals and a weak integration of social, emotional, and communicative behaviours; and especially, a lack of socio-emotional reciprocity. Similarly, qualitative impairments in communications are universal. These take the form of a lack of social usage of whatever language skills are present; impairment in make-believe and social imitative play; poor synchrony and lack of reciprocity in conversational interchange; poor flexibility in language expression and a relative lack of creativity and fantasy in thought processes; lack of emotional response to other people's verbal and nonverbal overtures; impaired use of variations in cadence or emphasis to reflect communicative modulation; and a similar lack of accompanying gesture to provide emphasis or aid meaning in spoken communication.

The condition is also characterized by restricted, repetitive, and stereotyped patterns of behaviour, interests, and activities. These take the form of a tendency to impose rigidity and routine on a wide range of aspects of day-to-day functioning; this usually applies to novel activities as well as to familiar habits and play patterns. In early childhood particularly, there may be specific attachment to unusual, typically non-soft objects. The children may insist on the performance of particular routines in rituals of a nonfunctional character; there may be stereotyped preoccupations with interests such as dates, routes or

timetables; often there are motor stereotypies; a specific interest in nonfunctional elements of objects (such as their smell or feel) is common; and there may be a resistance to changes in routine or in details of the personal environment (such as the movement of ornaments or furniture in the family home).

In addition to these specific diagnostic features, it is frequent for children with autism to show a range of other nonspecific problems such as fear/phobias, sleeping and eating disturbances, temper tantrums, and aggression. Self-injury (e.g. by wrist-biting) is fairly common, especially when there is associated severe mental retardation. Most individuals with autism lack spontaneity, initiative, and creativity in the organization of their leisure time and have difficulty applying conceptualizations in decision-making in work (even when the tasks themselves are well within their capacity). The specific manifestation of deficits characteristic of autism change as the children grow older, but the deficits continue into and through adult lie with a broadly similar pattern of problems in socialization, communications, and interest patterns. Developmental abnormalities must have been present in the first 3 years of the diagnosis to be made, but the syndrome can be diagnosed in all age groups.

All levels of IQ can occur in association with autism, but there is significant mental retardation in some three-quarters of cases.

Includes:

Autistic disorder

Infantile autism

Infantile psychosis

Kanner's syndrome

Differential diagnosis. Apart from the other varieties of pervasive developmental disorder it is important to consider: specific developmental disorder of receptive language (F80.2) with secondary socio-emotional problems; reactive attachment disorder (F94.1) or disinhibited attachment disorder (F94.2); mental retardation (F70-F79) with some associated emotional/behavioural disorder; schizophrenia (F20.-) of unusually early onset; and Rett's syndrome (F84.2).

Excludes:

Autistic psychopathy (F84.5)

F84.1 Atypical autism

A pervasive developmental disorder that differs from autism in terms *either* of age of onset *or* of failure to fulfill all three sets of diagnostic criteria. Thus, abnormal and/or impaired development becomes manifest for the first time

only after age 3 years; and/or there are insufficient demonstrable abnormalities in one or two of the three areas of psychopathology required for the diagnosis of autism (namely, reciprocal social interactions, communication, and restrictive, stereotyped, repetitive behaviour) in spite of characteristic abnormalities in other area(s). Atypical autism arises most often in profoundly retarded individuals whose very low level of functioning provides little scope of exhibition of the specific deviant behaviours required for the diagnosis of autism; it also occurs in individuals with a severe specific developmental disorder of receptive language. Atypical autism thus constitutes a meaningfully separate condition from autism.

Includes:

Atypical childhood psychosis

Mental retardation with autistic features

F84.2 Rett's syndrome

A condition of unknown cause, so far reported only in girls, which has been differentiated on the basis of a characteristic onset, course, and pattern of symptomatology. Thpically, apparently normal or near-normal early development is followed by partial or complete loss of acquired hand skills and of speech, together with deceleration in head growth, usually with an onset between 7 and 24 months of age. Hand-wringing stereotypies, hyperventilation and loss of purposive hand movements are particularly characteristic. Social and play development are arrested in the first 2 or 3 years, but social interest tends to

be maintained. During middle childhood, trunk ataxia and apraxia, associated with scoliosis or kyphoscoliosis tend to develop and sometimes there are choreoathetoid movements. Severe mental handicap invariably results. Fits frequently develop during early or middle childhood.

Diagnostic guidelines

In most cases onset is between 7 and 24 months of age. The most characteristic feature is a loss of purposive hand movements and acquired fine motor manipulative skills. This is accompanied by loss, partial loss or lack of development of language; distinctive stereotyped tortuous wringing or "hand-washing" movements, with the arms flexed in front of the chest or chin; stereotypic wetting of the hands with saliva; lack of proper chewing of food; often episodes of hyperventilation; almost always a failure to gain bowel and bladder control; often excessive drooling and protrusion of the tongue; and a loss of social engagement. Typically, the children retain a kind of "social smile", looking at or "through" people, but not interacting socially with them in early childhood (although social interaction often develops later). The stance and gait tend to become broad-based, the muscles are hypotonic, trunk movements usually become poorly coordinated, and scoliosis or kyphoscoliosis usually develops, Spinal atrophies, with severe motor disability, develop in adolescence or adulthood in about half the cases. Later, rigid spasticity may become manifest, and is usually more pronounced in the lower than in the upper limbs. Epileptic

fits, usually involving some type of minor attack, and with an onset generally before the age of 8 years, occur in the majority of cases. In contrast to autism, both deliberate self-injury and complex stereotyped preoccupations or routines are rare.

Differential diagnosis. Initially, Rett's syndrome is differentiated primarily on the basis of the lack of purposive hand movements, deceleration of head growth, ataxia, stereotypic "hand-washing" movements, and lack of proper chewing. The course of the disorder, in terms of progressive motor deterioration, confirms the diagnosis.

F84.3 Other childhood disintegrative disorder

A pervasive developmental disorder (other than Rett's syndrome) that is defined by a period of normal development before onset, and by a definite loss, over the course of a few months, of previously acquired skills in at least several areas of development, together with the onset of characteristic abnormalities of social, communicative, and behavioural functioning. Often there is a prodromic period of vague illness; the child becomes restive, irritable, anxious, and overactive. This is followed by impoverishment and then loss of speech and language, accompanied by behavioural disintegration. In some cases the loss of skills is persistently progressive (usually when the disorder is associated with a progressive (usually when the disorder is associated with a progressive

diagnosable neurological condition), but more often the decline over a period of some months is followed by a plateau and then a limited improvement. The prognosis is usually very poor, and more individuals are left with severe mental retardation. There is uncertainty about the extent to which this condition differs from autism. In some cases the disorder can be shown to be due to some associated encephalopathy, but the diagnosis should be made n the behavioural features. Any associated neurological condition should be separately coded.

Diagnostic guidelines

Diagnosis is based on an apparently normal development up to the age of at least 2 years, followed by a definite loss of previously acquired skills; this is accompanied by qualitatively abnormal social functioning. It is usual for there to be a profound regression in, or loss of, language, a regression in the level of play, social skills, and adaptive behaviour, and often a loss of bowel or bladder control, sometimes with a deteriorating motor control. Typically, this is accompanied by a general loss of interest in the environment, by stereotyped, repetitive motor mannerisms, and by an autistic-like impairment of social interaction and communication. In some respects, the syndrome resembles dementia in adult life, but it differs in three key respects: there is usually no evidence of an identifiable organic disease or damage (although organic brain dysfunction of some type is usually inferred); the loss of skills may be followed by a degree of recovery; and the impairment in socialization and by a degree of

recovery; and the impairment in socialization and communication has deviant qualities typical of autism rather than of intellectual decline. For all these reasons the syndrome is included here rather than under F00-F09.

Includes:

Dementia infantilis

Disintegrative psychosis

Heller's syndrome

Symbiotic psychosis

Excludes:

Acquired aphasia with epilepsy (F80.3)

Elective mutism (F94.0)

Rett's syndrome (F84.2)

Schizophrenia (F20.-)

F84.4 Overactive disorder associated with mental retardation and stereotyped movements

This is an ill-defined disorder of uncertain nosological validity. The category is included here because of the evidence that children with moderate to severe mental retardation (IQ below 50) who exhibit major problems in hyperactivity and inattention frequently show stereotyped behaviours; such children tend not to benefit from stimulant drugs (unlike those with an IQ in the normal range) and may exhibit a severe dysphoric reaction (sometimes with

psychomotor retardation) when given stimulants; in adolescence the overactivity tends to be replaced by interactivity (a pattern that is *not* usual in hyperkinetic children with normal intelligence). It is also common for the syndrome to be associated with a variety of developmental delays, either specific or global.

The extent to which the behavioural pattern is a function of low IQ or of organic brain damage is not known, neither is it clear whether the disorders in children with mild mental retardation who show the hyperkinetic syndrome would be better classified here or under F90.-; at present they are included in F90.-.

Diagnostic guidelines

Diagnosis depends on the combination of developmentally inappropriate severe overactivity, motor stereotypies, and moderate to severe mental retardation; all three must be present for the diagnosis. If the diagnostic criteria for F84.0, F84.1 or F84.2 are met, that condition should be diagnosed instead.

F84.5 Asperger's syndrome

A disorder of uncertain nosological validity, characterized by the same kind of qualitative abnormalities of reciprocal social interaction that typify autism, together with a restricted, stereotyped, repetitive repertoire of interests and activities. The disorder differs from autism primarily in that there is no

general delay or retardation in language or in congnitive development. Most individuals are of normal general intelligence but it is common for them to be markedly clumsy; the condition occurs predominately in boys (in a ratio of about eight boys to one girl). It seems highly likely that at least some cases represent mild varieties of autism, but it is uncertain whether or not that is so for all. There is a strong tendency for the abnormalities to persist into adolescence and adult life and it seems that they represent individual characteristics that are not greatly affected by environmental influences. Psychotic episodes occasionally occur in early adult life.

Diagnostic guidelines

Diagnosis is based on the combination of a lack of any clinically significant general delay in language or cognitive development plus, as with autism, the presence of qualitative deficiencies in reciprocal social interaction and restricted, repetitive, stereotyped patterns of behaviour, interests, and activities. There may or may not be problems in communication similar to those associated with autism, but significant language retardation would rule out the diagnosis.

Includes:

Autistic psychopathy

Schizoid disorder of childhood

Excludes:

Anakastic personality disorder (F60.5)

Attachment disorders of childhood (F94.1, F94.2)

Obsessive - compulsive disorder (F42.-)

Schizotypal disorder (F21)

Simple schizophrenia (F20.6)

F84.8 Other pervasive developmental disorders

F84.9 Pervasive developmental disorder, unspecified

This is a residual diagnostic category that should be used for disorders which fit the general description for pervasive developmental disorders but in which a lack of adequate information, or contradictory findings, means that the criteria for any of the other F84 codes cannot be met.

REFERENCES

REFERENCES

1. **Aarons, M. & Gittens, T**. (1987). The Autistic continuum - An assessment & intervention schedule for investigating behaviour skills and needs of children with Autistic spectrum difficulties. Windsor, Berkshire: NFER-NELSON.

2. **Adrien, J.L., Roux, S., Couturier, G., Malvy, J., Guerin, P., Debuly, S., Lelord, G., Barthelemy, C.** (2001). Towards a new functional assessment of autistic dysfunction in children with developmental disorders: The Behaviour Function Inventory. *Autism,* 5(3); 249-264.

3. **American Psychiatric Association.** (1994). Diagnostic and Statistical Manual of Mental Disorders. 4th ed. Washington, DC: APA.

4. **American Psychiatric Association.** (2000). Diagnostic and statistical manual of mental disorders (Fourth Edition-Text Revision (DSM-IV-TR).

5. **Baron-Cohen, S., Allen, J. & Gillberg,** C. (1992) Checklist for Autism in Toddlers. *British Journal of Psychiatry,* 12(6); 839-843.
6. **Bishop, D.V.M.** (1989). Autism, Asperger's syndrome and Semantic-pragmatic disorder: where are the boundaries? *British Journal of Disorders of Communication,* 24 ; 107-121.

7. **Chengappa,** S. & **Indu,** V. (1991). Variation in verbal and nonverbal behaviour in 5 Autistic children: A Clinical Observation. *Journal of the Indian Speech and Hearing Association,* 7 ; 37-44.

8. **Derek, R.** (1989). Childhood Autism II: Differential Diagnosis. *Journal of the National Institute of Health and Neurosciences,* 7(1); 71-76.

9. **Gillberg, C, Ehlers, S. & Shaumann, H.** (1990). Autism under age 3 years: A clinical study of 28 cases referred for autistic symptoms in infancy. *Journal of Child Psychology,* 31(6); 921-934.

10. **Gillberg, C, Gillberg, C, Rastam, M., Wentz,** E. (2001). The Asperger syndrome (and high-functioning Autism) Diagnostic interview (ASDI): A preliminary study of a new structured clinical interview. *Autism,* 5(1) ; 57-66.

11. **Gillberg, I.C., & Gillberg, C.** (1989). Asperger syndrome: some epidemiological considerations. A research note. *Journal of Child Psychology and Psychiatry,* 30(4); 631-638.

12. **Le Couteur, A., Rutter, M., Lord, C, Rios, P., Robertson, S., Hordgrafer, M., & McLennan, J.** (1989). Autism Diagnostic Interview: A Semi-structured interview for parents and caregivers of Autistic Persons. *Journal of Autism and Developmental Disorders,* 19(3); 363-387.

13. **Lord, C, Pickles, A., McLennan, J., Rutter, H., Bregman, J., Folstein, S., Fombonne, E., Leboyer, M. & Minshew,** N. (1997). Diagnosing Autism: Analysis of data from the Autism Diagnostic Interview. *Journal of Autism and Developmental Disorders,* 27(5); 501-517.

22. **Schreibman, L.E.** (1988). Autism, (pp. 52-60) CA: Sage Publications, Inc.

23. **Shea, V.,** & **Mesibov, G.B.** (1985). Brief Report: The relationship between learning disabilities and higher-level autism. *Journal of Autism and Developmental Disorders*, 15 ; 425-435.

24. **Volkmar, F.R.** (1996). Childhood and Adolescent Psychosis: a review of past 10 years. *Journal of the American Academy of Child and Adolescent Psychiatry*, 35 ; 843-851.

25. **Volkmar, F.R.** (1998). Autism and pervasive developmental disorders, (pp. 16-32) Cambridge University Press.

26. **Wing, L.** (1976). Diagnosis, clinical description and prognosis. In L. Wing (ed.) *Early Infantile Autism,* (pp. 38-41) Oxford: Pergamon.

27. **Wing, L.** (1980). Childhood Autism and Social Class: A question of selection? *British Journal of Psychiatry*, 137 ; 410-417.

28. **Wing, L.** (1988). The continuum of autistic characteristics. In E. Schopler & G.B. Mesibov (Eds.) *Diagnosis and Assessment in Autism,* (pp. 15-22))New York: Plenum.

29. **Wing, L.,** (1981). Asperger's syndrome: a clinical account. *Psychological Medicine,* 11 ; 115-129.

30. **World Health Organization** (1992). The ICD-10 Classification of Mental and Behavioural Disorders: Clinical Descriptions and guidelines. Geneva: WHO.

14. **Lord, C, Rutter, M., & Le Couteur,** A. (1994) Autism Diagnostic Interview - Revised: A Revised version of a diagnostic interview for caregivers of Individuals with possible pervasive developmental disorders. *Journal of Autism and Developmental Disorders,* 24 ; 659-685.

15. **Mauk, J.E.** (1993). Autism and Pervasive Developmental Disorders. *The Child with Developmental Disabilities,* 40(3); 567-578.

16. **Riley, A.M**. (1984). Autistic Behaviour Composite checklist and profile. Arizona: Communication skill builders.

17. **Rimland, B.** (1993). Plain Talk about PDD and the Diagnosis of Autism. *Autism Research Review International,* 7 (2); 25-30.

18. **Rutter, M & Schopler, E.** (1992). Classification of Pervasive Developmental Disorders: Some concepts and practical considerations. *Journal of Autism and Developmental disorders,* 22 ; 459-482.

19. **Rutter, M.** (1966). Behavioural and cognitive characteristics of a series of psychotic children. In L. Wing (Ed.) *Early Childhood Autism,* (pp. 30-45) Oxford: Pergamon.

20. **Rutter, M.** (1978a). Diagnosis and definition. In M. Rutter & E. Schopler (Eds.) *Autism: A reappraisal of concepts and treatment,* (pp. 20-37) New York: Plenum.

21. **Schopler, E., Reichler, R., DeVellis, R., & Daly, K.** (1980). Toward objective classification of Childhood Autism: Childhood Autism Rating Scale (CARS), *Journal of Autism & Developmental Disorders,* 10 ; 91-103.