

# *Autism & Asperger's Disorder*

*Avril V. Brereton PhD  
Bruce J. Tonge MD*

**Centre for Developmental Psychiatry  
Monash University  
Melbourne, Australia**

## WHAT IS AUTISM?

Autism is a syndrome consisting of a set of developmental and behavioural features that must be present for the condition to be diagnosed.

The core features of autism include impairment in three main areas of functioning;

- (i) social interaction,
- (ii) communication,
- (iii) restricted, repetitive and stereotyped patterns of behaviour, interests and activities (Einfeld & Tonge, 1992).

Kanner first described these core features in his paper of 1943 in which eleven children with "autistic disturbances of affective contact" (Kanner, 1943) showed a distinctive pattern of symptoms: (i) inability to relate to people and situations, (ii) failure to use language for the purpose of communication, and (iii) obsessive desire for the maintenance of sameness in the environment.

The DSM-IV diagnostic system emphasises that symptoms may change throughout life and behaviour problems can range from severe to milder impairments.

## WHAT CAUSES AUTISM?

The cause of autism is unknown. It is a biological condition probably due to a number of causes acting together rather than one specific cause.

We do know that children are probably born with autism. It certainly becomes obvious within the first 30 months of life. Autism affects the person throughout life.

### Some history

In the 1950s and early 60s some (eg Bettelheim, 1967) argued that autism was a schizophrenic withdrawal from reality and advocated residential centres for children, removing them from their families. Cold and rejecting parents were said to be causing autistic behaviour in their children and residential programmes were seen as a means of undoing autistic behaviours and establishing appropriate behaviours in their place. The treatment involved individual psychotherapy with the autistic child and attempts were made to change the parents and make them acknowledge their role in the development of the child's condition. Bettelheim (1967) referred to such a child as the "empty fortress".

This "psychogenic" theory and its treatment approaches fell from favour because it was not supported by evidence from systematic studies.

In the 70's, new research highlighted basic cognitive deficits and organic brain dysfunction. This became known as the "nature" theory of causation of autism and the bulk of the evidence pointed to a neurological (brain) dysfunction in autistic children.

Support for genetic influences on autism came from the research by Folstein and Rutter (1977), who undertook a study of 21 pairs of same-sexed twins, one or both of whom had autism. This study pointed to the "importance of brain injuries, especially during the perinatal period which may operate either by themselves or in combination with a genetic disposition involving language. Both mode of inheritance and exactly what is inherited remain uncertain"

### **Recent brain research**

It is assumed that people with autism probably share certain common features of abnormal brain function, but the nature of this underlying neural pathology remains elusive and controversial.

Varied findings suggest that autism is a disorder that encompasses both subcortical and cortical levels of brain processing. Abnormal brain activity, arousal levels, deficits in the ability to respond accurately to sensory input, abnormal event related potentials measured in the brain, impairment of left hemisphere functioning, pathophysiology of the temporal lobe and specific structural abnormalities have been investigated.

Current research points to abnormalities in brain systems that are sub-served by brain stem structures such as the cerebellum and limbic system and there is evidence that the brains of people with autism are often underdeveloped and immature. Other researchers have reported increased head circumference and brain volume but these findings have not been linked to clinical features such as severity of autism or IQ levels.

Neurotransmitters such as serotonin have also been implicated, but abnormalities that have been found have not been shown to be specific to autism and the only consistent finding is the elevation of whole blood serotonin levels in about 25% of individuals with autism. The significance of this is unclear, although Bailey (1996) suggested that developmental mechanisms in the brain may be affected.

Current neurobiologic theories postulate single or multiple primary clinical deficits in higher-order cognitive processing abilities, for example involving language, social understanding and emotional insight; and the involvement of cerebral cortex in the final common pathway for the clinical symptomatology.

Future research is needed to define: (i) the pathophysiology of the clinical syndrome of autism; (ii) the developmental pathophysiology of the structural and functional brain abnormalities that underlie the clinical syndrome and (iii) the genetic mechanisms that trigger the disruption in brain development that lead to these abnormalities.

### **Recent genetic research**

Recent genetic research has attempted to address the issues of transmission of vulnerability to autism and the nature of the autistic phenotype. There is now no doubt that genetic factors play an important, if not central, role in the causation of autism although the precise genetic mechanisms have not been determined.

Evidence points to not a single gene but the interaction of at least three abnormal gene sites.

Autism is 3-4 times more common in males. The chance of having a first child with autism is less than 1:1000 but reduces to probably about 1:50 with a second child, particularly if it is male. There is also the increased likelihood of a family history of learning problems, speech delays, aloofness and social eccentricity, obsessional behaviours and depression.

It is anticipated that advancement in molecular genetics will help in the understanding of how the genes involved lead to autism, whether there is an interaction between specific environmental features and genetic susceptibility and why there is variation in the cognitive impairment that is associated with autism.

### **What we now know about causes of autism**

Research over the past forty years has clarified a number of issues about the causes of autism.

The psychogenic causation theory of the 50's has been found to be lacking in evidence and dismissed. Evidence has made it clear that autism is a neurodevelopmental disorder involving basic cognitive and information processing deficits, affection, communication and social skills.

However, many questions remain unanswered regarding the neuropathophysiology of autism and the mode of genetic inheritance.

### **Associated medical conditions**

There is a frequent association between autism and a number of medical conditions that affect the brain, such as:

- tuberous sclerosis and congenital rubella
- pre- and perinatal trauma, neonatal asphyxia
- certain acquired encephalopathies and brain malformations
- metabolic disorders such as PKU, histidinemia, and Lesch-Nyhan syndrome
- a number of genetic conditions and chromosomal abnormalities including: Fragile X, tuberous sclerosis, Cornelia de Lange syndrome, Joubert syndrome, Williams syndrome and Hypomelanosis of Ito.

Most importantly, there is an approximately 30% risk of developing seizures through childhood to early adulthood. The majority of persons with autism have non-specific abnormal electrical brain activity shown on an electro-encephalogram (EEG).

Some other medical conditions that lead to intellectual disability are rarely associated with autism, noticeably Down Syndrome and cerebral palsy.

The nature and meaning of the association between autism and these various other neurobiological conditions has yet to be determined.

### **HOW COMMON IS AUTISM?**

Prevalence estimates for autism have been gathered for over thirty years. At least twenty- three prevalence studies have been reported in the literature from 1966 to 1997. These studies use varying diagnostic criteria as definitions of autism have changed over time and population samples have varied in size and type.

Recent works with the most rigorous ascertainment methods have consistently yielded rates of about 9 per 10,000. A prevalence rate for autism of 10-12 per 10,000 was reported by Gillberg (1997) who computed a mean of the numerous studies conducted worldwide since 1985. These studies all adopted a broader definition of autism than that used in earlier work. In the most recent review of 19 prevalence studies from 10 different countries, covering the period from 1966 to 1996, Fombonne (1998) estimated that the average figure was about 60 per 10,000 or 1 in 160. It has been suggested that the prevalence of autism is increasing however; improved community awareness and assessment may have increased the number identified. Autism is approximately four times more common in males than females.

**DIAGNOSIS OF AUTISM.**

Because the cause of autism is unknown, diagnosis relies upon matching the child's behaviour patterns and development with the diagnostic criteria. Autism usually emerges in early infancy, but the diagnosis of autism remains especially difficult before two years of age when language skills become more obvious.

In 1980, the American Psychiatric Association's Diagnostic and Statistical Manual (DSM-III) introduced the diagnostic term: Pervasive Developmental Disorder (PDD) to cover a group of disorders of development including autism which presented with abnormalities and impaired functioning across the social, cognitive, emotional and language domains. These impairments were present from the first few years of life.

The DSM-IV includes five categories of pervasive developmental disorders; Childhood Disintegrative Disorder, Asperger's Disorder and Rett's Disorder and Pervasive Developmental Disorder- Not Otherwise Specified (PDD-NOS).

**Autism Spectrum Disorders**

The term Autism Spectrum Disorders (ASD) is currently used but its definition lacks the level of international agreement attached to Pervasive Developmental Disorders.

For some, ASD refers to a group of different autistic-like conditions, a similar concept to PDD. For others, ASD refers to a unitary concept of autism conveying a notion of severity from the aloof intellectually delayed child with "Kanner" type autism at the severe end through to intelligent, less severely disturbed children with Asperger's Disorder (AS) at the other end of the spectrum.

The problem with this approach relates to what is being defined as severe to mild. Is it IQ level, or language ability, or obsessional behaviour, or social impairment? Young people with AS may have the intelligence on IQ testing of a typical child but might have severe impairment in social behaviour and crippling obsessions. Therefore, the concept of severity relates to multiple cognitive, social and behavioural domains and has limited if any value if applied to a child with PDD.

There is now a general international consensus regarding the development of features and behaviours that are required to make a diagnosis of Autism defined in either the International Classification of Diseases 10<sup>th</sup> Edition ICD-10 (WHO) or the DSM-IV.

### **DSM-IV Criteria for Autistic Disorder**

---

- A.** A total of at least six items from (1), (2), and (3), with at least two from (1), 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 non-verbal behaviours 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) Markedly impaired expression of pleasure in other people's happiness;
    - (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 gestures or mime);
    - (b) In individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others;
    - (c) Stereotyped and repetitive use of language or idiosyncratic language;
    - (d) Lack of varied spontaneous make-believe play or social imitative play appropriate to developmental level.
  - (3) Restricted repetitive and stereotyped patterns of behaviour, interests, and activities, as manifested by at least one of the following:
    - (a) Encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus;
    - (b) Apparently compulsive adherence to specific non-functional routines or rituals;
    - (c) Stereotyped and repetitive motor mannerisms ( e.g., hand or finger flapping or twisting, or complex whole-body movements );
    - (d) Persistent preoccupation with parts of objects.
- B.** 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.
- C.** Not better accounted for by Rett's Disorder or Childhood Disintegrative Disorder.

---

From the Diagnostic and Statistical Manual of Mental Disorders, 4<sup>th</sup> Edition, (1994). Washington, DC: American Psychiatric Association, pp. 70-71.

## ASSESSMENT

It is clear from the DSM-IV diagnostic criteria that the diagnosis requires a comprehensive, multi-disciplinary assessment comprising at least:

- developmental and family history
- observation of the child's behaviour and interaction with others
- a medical assessment including tests for known causes of developmental delay (eg chromosome analysis) and hearing tests
- a cognitive assessment using appropriate tests such as: Psychoeducational Profile-Revised (PEP-R) (Schopler et al, 1990), Wechsler Pre-school and Primary Scale of Intelligence-Revised (WPPSI-R) (Wechsler, 1989)
- structured language assessment
- structured assessment tools such as the Autism Diagnostic Instrument and Observational Scales (Le Couter et al, 1989; Lord et al, 1989), clinician completed rating scales e.g. the Childhood Autism Rating Scale (CARS) (Schopler et al, 1980), and parent or teacher completed checklists such as the Developmental Behaviour Checklist (DBC) (Einfeld & Tonge, 1992).
- Comprehensive and sensitive feedback to the parents and carers about the diagnosis as the first step in developing a plan of intervention and services required.

### Assessment Instruments

Over the past forty years various instruments have been developed specifically to assist in the diagnosis of autism and measurement of associated behaviours.

Because the cause of autism is unknown, diagnosis relies heavily upon behavioural description, observation of the child's behaviour patterns and history of development being matched with the diagnostic criteria. Therefore assessment instruments assist in the screening for autism, standardisation of diagnosis and measurement of change.

Contemporary assessment instruments are usually administered in one of three ways: a checklist or rating scale completed by a trained clinician based on behavioural observation (eg Childhood Autism Rating Scale (Schopler et al, 1980), Autism Behaviour Checklist (Krug, Arick & Almond, 1980) ; a structured parent/carer interview administered by a trained clinician ( eg the ADI/ADOS (Le Couteur et al, 1989; Lord et al, 1980); or a parent/carer completed questionnaire (eg the Developmental Behaviour Checklist (Einfeld & Tonge, 1992); the Autism Screening Questionnaire (Berument et al, 1999).

No one instrument is able to undertake all the tasks of diagnosis, behavioural description, measurement of response to treatment or change over time, and serve as a screening instrument. At present clinicians and researchers must evaluate an instrument's ability to meet a specific purpose and choose the appropriate psychometrically sound instrument(s) from the range available.

## HOW DOES AUTISM AFFECT CHILDREN?

### 1. Social impairments

One of the key features of autism is abnormality in interpersonal relationships, such as: reduced responsiveness to or interest in people, an appearance of aloofness and a limited or impaired ability to relate to others.

Infants with autism do not assume a normal anticipatory posture or put up their arms to be picked up and often do not seek physical comfort. However they do show selective attachments to their primary caregivers. It is not simply the case that infants with autism do not develop social relating skills. It is more true to say that the quality of the relationship is abnormal.

Children with autism show very little variation in facial expression in response to others, generally have abnormal eye contact and tend not to engage in social imitation such as waving bye-bye and pat-a-cake games.

They rarely develop an age-appropriate empathy or ability to understand that other people have feelings. Their ability to make friends is absent or distorted and they are usually unable to play reciprocally with other children. All children with autism show social impairments, however, the nature of these impairments can vary and may modify as the child grows older. For example, there may be an increase in interest in other people and the development of some social skills often learned in a mechanical or inflexible manner.

### 2. Communication skills

Impairments in both verbal and non-verbal communication skills are often the cause for parents of children with autism to be first concerned and seek help.

Children with autism usually have markedly delayed and deviant speech with approximately half failing to develop functional speech. Research supports the notion that approximately 50% of children with autism will eventually have useful speech. Children with autism also have an impaired ability to use gesture and mime.

In those children who do develop language, the pattern of development and usage is strikingly deviant. Tone, pitch and modulation of speech is often odd and the voice may sound mechanical and flat in quality with a staccato delivery. Some children speak in whispers or too loudly, sometimes developing an unusual accent.

Their understanding of spoken language is often literal and they fail to comprehend underlying meaning and metaphor such as "shake a leg", or "pull your socks up".

Abnormal use of words and phrases is a common symptom of autism. Echolalia (repetition of language spoken by others) is one of the most noticeably deviant aspects of speech. It can be either the immediate repetition of what has just been said, or the delayed repetition of phrases. Some children repeat advertising jingles or large pieces of dialogue, perhaps days later, from videos for no apparent reason. Echolalic speech may serve some function.

Children with autism often confuse or reverse pronouns. Kanner originally attributed this to echolalia however more recent research has found that this problem relates to the deficits that autistic children have in understanding the perspective of another, joint attention and difficulty conceptualising the notion of self and other.

Some children have idiosyncratic speech and neologisms such as "door go by" when asking to go outside, or calling a drink a "dorfla".

Language comprehension (receptive language) deficits in autism are also of great importance. Poor understanding is probably linked to social difficulties and impairments in social understanding. Inability to express needs by words or gesture, or a significant difference in the child's ability to use words compared to their level of understanding of the verbal responses of others, is a source of frustration and can cause distress or disturbed behaviour.

Even those children with autism who develop a wide vocabulary and expressive verbal skills show difficulty with the pragmatic or social use of language. They have impaired ability to initiate conversation, communicate reciprocally with others and maintain the "to and fro" of a conversation. The child with autism is more likely to talk at you rather than with you, to intrude and talk out of context and use speech as a means to an end rather than engage in a social conversation. Howlin (1998) described the "failure to use communication for social purposes" as the most characteristic feature of the language deficit in autism.

### **3. Play and Imagination**

Children with autism usually have rigid and limited play patterns with a noticeable lack of imagination and creativity. They may repetitively line up toys, sort by colour, or collect various objects such as pieces of string, special stones or objects of a certain colour or shape. Intense attachment to these objects can occur with the child showing great distress if these objects are taken away or patterns disrupted.

Older children may develop play that superficially appears to be creative, such as re-enacting the day at school with dolls and teddies, or acting out scenes from favourite videos. Observation of this type of play over time often reveals a highly repetitive, formalised scenario that does not change and cannot be interrupted.

Children with autism rarely involve other children in their play unless they are given a particular role in a controlled situation. Howlin (1998) drew a parallel between the pervasiveness of the language disorder in autism and the child's inability to develop normal, imaginative play patterns. The stereotypes seen in language are also observed in the repetitive, non-social and ritualistic play of children with autism.

### **4. Ritualistic and Stereotyped Interests or Behaviours**

Ritualistic and compulsive phenomena are also common, such as touching compulsions and rigid routines for daily activities. There is often an associated resistance to change in routine or the environment so that the child may become extremely distressed if, for example, a new route is taken going to school, the furniture in the house is rearranged, or the child is asked to wear new clothes.

Hand and finger mannerisms and repetitive complex body movements of a stereotyped kind such as hand flapping or tip toe walking are common. There is often a fascination with movement of objects such as spinning a plate or wheel. Close visual scrutiny of the fine detail of an object such as the edge of a table, or pattern of spokes on a wheel is common as is the collection of objects such as buttons or twigs. Many children with autism, especially in middle to late childhood, have unusual preoccupations that they follow often to the exclusion of other activities. These may involve a fascination with bus routes or train timetables in association with repeatedly asking questions to which specific answers must be given.

### **5. Associated features**

Many other abnormalities are associated with autism such as unusual dietary habits, sleep disturbance, abnormalities of mood and self-injurious behaviour. Perceptual abnormalities such as lack of response to pain, heightened sensitivity to sound and preoccupation with tactile stimulation are also common. These associated features are not specific to individuals with autism and may occur in other children with intellectual disability.

## 6. Cognitive abilities & IQ scores

Although Kanner stated that children with autism possessed normal cognitive potential and "islets of ability", it is now quite clear that the majority of children with autism have intellectual disability.

A recent review of the literature found that in most epidemiological samples approximately 50% of cases exhibit severe intellectual disability, 30% mild to moderate disability and the remaining 20% have IQ's in the normal range. Low IQ scores are more likely to be associated with the development of epilepsy. One third of intellectually disabled children with autism develop epilepsy whilst only approximately one in twenty of those with normal intelligence do.

IQ scores of children with autism often show an unusual and distinctive pattern of performance on standardised tests of intelligence.

Individual profiles usually show a wide scatter of abilities with deficits in verbal sequencing and abstraction skills although rote memory may be relatively better. Tasks requiring manipulative, visuo-spatial skills or immediate memory may be performed well, such as Block Design, Object Assembly and the Seguin Formboard. These skills may be the basis of "islets of ability" such as musical ability shown by a few children with autism. Around 20% of children with autism have overall cognitive abilities in the normal range and are referred to as "high functioning", but still usually have the pattern of a relatively wide scatter of abilities.

The cognitive deficit is as much social as intellectual and linguistic. Rutter (1983) contended that these cognitive deficits are basic to the condition of autism and not secondary features. It has been found that such deficits are present in virtually all children with autism and that they constitute the most powerful predictors of functioning in later adolescence and early adult life.

Cognitive deficits are a fundamental aspect of the disability of autism.

## DOES AUTISM CHANGE OVER TIME?

Yes, autism does change over time.

Stone (1997), described the classic picture of autism in a young pre-school aged child as one who exhibits a marked lack of interest in others, failure in empathy, absent or severely delayed speech and communication.

Marked resistance to change, restricted interests and stereotyped movements may develop or become more noticeable after 3 years of age.

The form and degree of features may change markedly as the child grows older but the core social, communication and behavioural difficulties persist. Many parents find the pre-school years most difficult to manage but, with early intervention and education, improvement can be expected.

With education and training primary school aged children usually become more socially responsive and communication skills increase. Self-stimulatory behaviours, problems in coping with change and transitions and disruptive or compulsive behaviour may increase at this time.

Adolescence can also bring the development of symptoms such as aggressive and oppositional or obsessive compulsive behaviour, and an increase in anxiety, tension and mood disturbance. Depressive illness is not uncommon and is probably due to a combination of the development of some degree of insight as well as hormonal and central nervous system (CNS) functional changes (Prior & Tonge, 1990; Wing, 1988).

There is a relatively increased risk for the development of seizures in adolescence. Estimates indicate that that 25% to 40% of people with autism develop epilepsy before the age of 30. Gillberg and Steffenberg (1987) noted an increased risk for boys.

**What is the long-term outcome?**

Outcome, or follow up studies of people with autism in later life are few. Venter, Lord and Schopler (1992) studied higher functioning adolescents and adults to determine the role of cognitive and behavioural factors in predicting later social-adaptive and academic achievement. They found that early verbal skills were the best predictor of both academic functioning and adaptive behaviour later in life. Gillberg and Steffenberg (1987) followed forty-six cases into early adulthood and found that 60% to 75% had relatively poor outcomes in social adjustment. Of these about half were institutionalised.

During adulthood the majority of persons with autism are likely to require some level of support. For example, one study found that two thirds of the group were in day or residential treatment programmes (Goode, 1994). A minority are able to work and live independently and have some social contact and friendships. Another minority deteriorate or need high levels of care.

It is usually those adults who have higher levels of cognitive and communication skills that are able to live independently and remain in employment; however some difficulties with social interaction remain. The majority of people with autism will experience behavioural, emotional and social problems throughout life, but nevertheless will make some developmental improvement and progressively become more independent.

Unfortunately in the young child with autism there is no way of knowing with confidence what the developmental trajectory will bring.

**Do young people with autism have additional emotional and behavioural problems?**

Children and adolescents with autism have high levels of anxiety and mood disturbance, disruptive and self-absorbed behaviour as well as communication disturbance and social relating problems.

The high levels of emotional and behavioural disturbance persist throughout childhood and adolescence.

**Anti-social behaviour:**

Anti-social behaviours that require social intention and awareness, such as lying, stealing, hiding, lighting fires and refusing to go to school or work are seldom seen in autism as they require a degree of social knowledge and skill beyond most young people with autism. However, behaviour perceived by others as anti-social may occur in persons with autism, particularly in those with higher intellectual abilities, as a manifestation of an obsessional preoccupation or self-stimulatory activity without social intent or understanding of the impact on others. For example, one young man regularly set fire to the hay shed on the family farm because he enjoyed the sight, sound and smell of the flames.

**Disruptive behaviour:**

Disruptive behaviour, such as tantrums, noisiness, abusiveness, impatience, aggression, self-injury and stubbornness is problematic for clinicians, family, and teachers alike.

In the school setting, disruptive behaviour has been found to relate directly to a loss of productive learning time. Disruptive behaviours are also likely to contribute to failure of integrated school placement in a mainstream setting and the rise of more restricted special school placements. High levels of disruptive behaviour also contribute to parental burden and are the main reason for placement of children into respite care or residential care.

**Anxiety:**

Young people with autism often have high levels of anxiety. The symptoms of anxious behaviour included fear of separation from familiar people, specific fears or phobias (eg certain sounds, smells, objects, animals), resistance to change (eg new clothes, food, routines), panic and emotional distress for little or no apparent reason, tenseness, shyness and irritability. These co-morbid symptoms of anxiety, apart from the distress they cause the child, have the potential to disrupt education, further impair social interaction and create management problems and stress for the parents and carers.

The identification of anxiety in a child with autism creates an opportunity for management. Psychological treatments, particularly cognitive and behavioural approaches are effective treatments. Pharmacological treatments, such as selective serotonin re-uptake inhibitors and tricyclic anti-depressants may also reduce anxiety in children. Psychological treatments might need some modification in order to compensate for language impairment, and the effectiveness of pharmacological treatments need to be confirmed using baseline and follow up records of target symptoms.

These co-morbid emotional and behavioural problems are not confined to young children with autism, but remain a challenge for parents and carers at least into adolescence. Further follow up studies are required to follow the changes in psychopathology into adult life.

**Depression:**

Adolescents with autism are at increased risk of suffering depression and mood disturbance with associated symptoms of irritability, sleep and appetite disturbance (including weight loss), obsessional thoughts and preoccupations, compulsive behaviours, psychomotor retardation, and thoughts of suicide with a potential to act on these thoughts. These symptoms of mood disorder are likely to impair their education and school adjustment, further handicap their already compromised social interactions and interfere with the quality of their family life.

Depression responds to psychological treatments such as cognitive therapy, relaxation training, and pleasant events scheduling modified according to the intellectual ability of the young person. Rewarding experience, reduction of stress at home and school and attention to parental mental health are helpful. Antidepressant medication may also be necessary if the depression is severe or persistent.

**Attention Deficit Hyperactivity:**

Distractibility, lack of concentration, impulsiveness, poor planning ability, disorganised behaviour, fidgetiness and motor overactivity are common symptoms in young people with autism but may decrease with maturity. Management requires a broad approach including planned, structured, time limited activities in simple steps, limitation of the amount of environmental stimulation, planning for change, communication programmes (eg visual systems), behaviour modification, relaxation and perhaps medication.

**APPROACHES TO TREATMENT**

There is no cure for autism. Many treatment approaches and therapies have been reported during the past four decades often without strong empirical evidence of benefit. Many of these were based on specific theories of causation. Some came and went quickly, such as swimming with dolphins. Others became outdated such as aversive therapies, as knowledge increased and social approaches to disability and ethics changed.

Current treatment usually consists of well-designed, multidisciplinary structured treatment programmes that incorporate developmental approaches with early intervention, special education, behavioural management, social and communication skills training and psychotropic

medication when indicated. Treatment must be a collaborative approach between the family/carers and the professionals involved in the child's care.

### **1. Behavioural Approaches:**

Behavioural approaches to the education, treatment and management of young people with autism have been successfully used for the past three decades. It is now clear that behaviour management techniques lead to a reduction in difficult behaviour and may increase social, communicative and cognitive skills in some people with autism.

#### **(i) Traditional approaches**

In traditional behaviour management, the target behavioural problem is studied then the environment is manipulated in such a way as to increase, decrease or maintain the behaviour. This is referred to as the ABC approach. The target Behaviour to be managed is described and then either the Antecedents and/or the Consequences of the behaviour are manipulated. For persons with autism, the treatment programme comprises a set of procedures designed to reduce behavioural excesses (eg self-stimulation, obsessions, self-injurious behaviour) and to increase behavioural competence (eg attention to task, language and social skills). Current behaviour management combines the teaching of new skills together with the suppression of undesirable behaviours. There are several ways of encouraging and increasing new behaviours. Some commonly used methods are:

##### 1. Positive reinforcement:

This is the easiest and most often used method of strengthening a behaviour. By following the target behaviour with a pleasant event we are increasing the likelihood of that behaviour occurring again. One of the trickiest things here is to work out what the child actually finds pleasant! We must not assume that what we find pleasant and rewarding will be shared by others, particularly children with autism. For example, we may find attention in the form of a hug and a kiss very pleasant, but for the child with autism this may actually be experienced as unpleasant and overwhelming.

##### 2. Time out:

This strategy is widely known and used to decrease undesirable behaviours in young children. The underlying principle is that most people like to be rewarded with attention or some other positive feedback when a behaviour has occurred. If that behaviour is met with no positive reinforcement, and the child is actually removed from any opportunity of attention, the behaviour is less likely to happen again. The child may be taken to another room or merely sent to another part of the room he/she is currently in and ignored for a short time. This method does rely on the child being able to link the two events, ie no attention because of what he/she has just done. For some children with autism, the removal to a quiet and empty space may actually be rewarding and lead to an increase in some behaviour in order to achieve isolation.

Time out can be effective as a "circuit breaker" for both child and parent when a break or separation is needed to stop a situation from escalating. Time out for the parent and child to cool down, and the parent to think through how best to respond. Time out is best used in conjunction with methods that teach new or replacement behaviours.

##### 3. Prompting:

This is a procedure that is used when the required behaviour does not exist at all. The child is guided to perform the response. There are a number of ways to prompt a child.

Physical prompts are literally "hands on" attempts to encourage the new behaviour. For example, if the new behaviour required is for the child to eat using a fork rather than his fingers, the physical prompt will involve putting your hand over the child's on the fork and helping him to stab the food and lift it to his mouth.

Verbal prompts involve telling the child what to do. For example "Stab your food with the fork". Verbal prompts need to be very explicit and concrete at first. It is not sufficient to just say "Use your fork" as it doesn't tell the child exactly what he should be using the fork for (eg to poke the cat!).

Pointing can also be used to prompt the correct response. Eventually the prompt will fade and become unnecessary over time. At first a combination of prompts is usually required. For example, a physical prompt will be combined with a verbal prompt that clearly tells the child what to do as he is doing it. As the behaviour is improving, the physical prompt may be dropped and a point and verbal prompt used instead.

Subtle prompts can be used very successfully with older children where a new behaviour has been learnt but the child still needs just a little cue or reminder of what to do. For example, in the classroom, a child who continually shouted out to enthusiastically contribute to the class had to learn to put up his hand and wait for the teacher to say his name. The cue he continued to need was simply the teacher raising a finger to indicate that he needed to raise his hand. The benefit of a small cue is that it helps the child without being obvious to everyone else.

#### 4. Shaping:

This method involves encouraging and reinforcing successive approximations of the new behaviour until the behaviour is learnt. For example, if the child is unable to wave bye-bye, any attempt to raise a hand or arm in response to your waving bye-bye is rewarded. It may begin with only a slight movement. As the child gets better at raising her arm and moving her hand you wait until both occur before giving the reinforcer. The child learns that more is expected of her in gradual steps until the whole wave is learnt.

Shaping is a useful method to use with young children at any developmental level. It does not require the child to have an existing level of speech or comprehension of speech. Shaping can be used without spoken instructions, although praise and encouragement through words usually accompanies the reinforcer. It does require some ability in the child to attend and imitate an action.

#### 5. Chaining:

This is a useful way of teaching a more complex behaviour or task and involves breaking it down into small steps. The steps are then taught one at a time. As each step is learnt, the next is taught. You can't miss steps, or teach them out of logical order.

Self-help skills, such as dressing are often taught using this method. For example pulling up pants. The task has a lot of different steps which need to be thought about and written down. If you are forward chaining, you start with the first step which may be picking the pants up in both hands. The next step may then be lifting one leg to step into the pants etc. If you are using backward chaining you teach the other way around and start with the last step which would be the final pulling up of the pants.

Chaining breaks down the task into tiny steps that do not overwhelm the child and you work through one step at a time until the whole task has been learnt. Success builds on success as each step is mastered. This method is very successful when teaching young children with few skills and little language.

#### **(ii) Understanding the communicative function of difficult behaviour**

More recent approaches try to understand the *function* or *purpose* of particular behaviour and what the person is trying to tell us, i.e. the *communicative function* of the behaviour. Current behaviour management programmes for persons with autism take into account more than the ABC approach considering: individual variables, environmental factors and the how the ability to communicate is affecting behaviour.

For example, disruptive behaviours such as aggression, self-injury, stereotypies may have as many as 5 communicative functions such as:

- to indicate the need for help or attention;
- to escape from stressful situations or activities;
- to obtain desired objects;
- to protest against unwanted events/activities;
- to obtain stimulation.

If the communicative function of the behaviour can be determined, then it is possible to teach a substitute behaviour that helps the person to get his/her message across more appropriately.

## **2. Early Intervention:**

There have been numerous approaches to early intervention for children with autism. These include: home-based versus school-based programmes; integrated versus specialist autism settings; length of intervention varying from 4 – 40 plus hours per week. Most treatments report gains in symbolic play, language and social interaction. Early intervention programmes employ both behavioural and special education techniques. Professional teaching support is vital for those family members and carers who are working on treatment programmes at home as they are generally intensive and demanding.

Recent claims that highly intensive behaviourally-based interventions (40 plus hours per week, for two years or more) lead to recovery or normal functioning are controversial. Behavioural interventions probably lead to improvements, particularly in scores on IQ tests, however, suggestions that initial benefits are maintained over time require replication. Longer term evaluations are needed, particularly those that measure social communication and interaction, conceptual abilities, obsessional and ritualistic behaviours, and the additional emotional and behavioural problems associated with autism.

The specific effects of early intervention require further study, particularly the effects of different treatments and the responses of sub-groups of children with autism, such as lower and higher functioning children.

## **3. Teaching and Special Education:**

Special educational programmes for children with autism are individually designed by teachers using a problem solving approach to address specific needs. These programmes aim to provide predictable, consistent and highly organised teaching situations in the classroom. The child's specific cognitive profile needs to be considered, eg, the use of visual-based rather than verbal instruction will improve outcome in the child with good visual-motor skills. The response to teaching is related to the severity of intellectual and language impairment, however, most children make some gains when behavioural methods and special educational approaches are used.

The move to integrate children with autism into as normal a learning situation as possible is generally appropriate. Placement in mainstream or special education schools is generally dependent upon the child's intellectual level. Integration is a desirable principle, however, some children with autism have difficulty without close supervision and support. Without adequate special resources and teaching, children with autism are at risk of becoming more isolated and unoccupied, or may become more disruptive and disturbed.

## **4. Communication Skills Programmes:**

It is not possible to put appropriate intervention programmes (either language or behavioural) in place without careful assessment of the person's current level of cognitive and language functioning. Lower functioning or non-verbal people with autism also require assessment of possible communicative intent in their behaviour (eg. the child who hits himself when he wants an activity to stop). For those who have speech, it is also important to assess pragmatic (the social use of speech) abilities. Recently, more attention has been paid to the effects of communication

problems on behaviour in order to replace inappropriate behaviour with more effective communication eg, using a picture system.

**Augmentative communication** helps those who are non-verbal to communicate by using other systems. These systems are called "augmentative" because they augment or increase the strength of the person's power to communicate. Visual systems using simple pictures and line drawings, signing systems and also photographs are often used to augment communication for children with autism. Each person must be carefully assessed to determine which system will suit him/her best. The choice of system to help improve communication will depend upon level of cognitive and language ability.

Three systems frequently used are signing, the Compic (computer generated pictures) system, and also photographs and objects.

**(i) Signing:** was probably the first alternate system used with non-verbal children with autism. At first, the signing systems used by the deaf were taught, but these are complex systems that require finger spelling of words and use abstract concepts. In the early 80's, a simpler system called Makaton was devised to use with children with intellectual disability. This system has varying degrees of difficulty, but at its easiest level, signs learnt are simple, concrete and do not require difficult finger spelling. Many of the first signs learnt use only one hand. For example, the sign for drink uses one hand in the shape of a cup that is lifted to the mouth and tilted as if the child were having a drink.

One advantage of signs is that they are very portable and do not require the child to carry around equipment. Another advantage of establishing a signing system is that it has been found to encourage speech in children, rather than what many parents fear, that it would reduce the chance of their child talking. However, signing is not widely understood in the community and the child may not always be well understood outside the circle of those who can sign with him/her. Signing does also require that the child can attend to the person teaching the signs and also imitate an action.

**(ii) Compic** (computer generated pictures): are used successfully in many teaching programmes. Compics are very simple and clear line drawings that represent a wide range of objects, actions, feelings etc. They can be used initially at a very simple, but practical level with young children who learn to point at the picture or show the picture to indicate their needs. When children are familiar with a number of these pictures, they can be put into a wallet of pictures that the child carries with him and takes out to indicate his needs. The child gradually builds up a vocabulary of pictures to meet his own special needs. Compic programmes are widely available in computer software format and loose-leaf book. Compic pictures are easily understood by everyone and do not require the child to learn and remember complex actions, as does signing. Children who have low cognitive skills can generally use a picture system in a simple way to communicate more effectively.

**(iii) Photographs:** of objects and people in the child's world can be used effectively with lower functioning children who cannot master the use of symbols or line drawings. Use of photographs usually requires that the child first learns to match an object with an photograph of that object. The child learns that the photograph represents the object. The photograph must be simple, clear and uncluttered. After the child has learnt to match photographs and objects, the more complex concept of matching photograph and activity or action can be taught.

Once the child is able to recognise a number of photographs, a photo vocabulary can be built up in the same way as a Compic vocabulary. Photographs can be used to help the child understand timetables or the steps involved in completing an activity. For example, the classroom may have photographs of the day's activities pinned to the wall. When each activity finishes, the child may put away that photograph. Similarly, when the child is required to get dressed, the steps involved may be pinned to his bedroom door in the correct sequence and easily followed.

**(iv) Objects** can be used in a similar way to photographs with children who have difficulty understanding photographs. Object time-tables are useful. Objects that represent activities can be laid out or stuck on the wall to show the child what happens next. For example, a crayon means work at the table, and the next object is a juice box straw that represents snack time comes after work.

A great advantage of photographs and objects is that the child can attend to them for as long as he/she needs to, and also return to them to refresh his memory. This is not possible with a sign where once the sign has been demonstrated, it is gone.

### **5. Social Skills Programmes:**

Social impairment in autism affects most aspects of the person's functioning. The approaches used to treat social difficulties vary according to the needs of each person with autism, particularly, their level of cognitive ability, age and the nature of their social impairment. For example the young child with autism who is aloof and withdraws from social contact requires a very different programme to an older, more able adolescent who attempts to join in with others but shows little empathy or reciprocity. Areas covered may include social isolation, understanding about friends and strangers, social play skills, interacting with peers, understanding rules and when they may be broken, understanding emotions and increasing imaginative and social imitative play.

Treatment for young children with autism initially involves the teaching of social skills according to specific, inflexible rules that can be learnt in specific situations eg "You only talk to people you know, not strangers". As children grow older social skills training may include the use of:

**Picture scripts:** (drawings that represent social situations and how to handle them) to rehearse social situations and teach a range of appropriate responses

**Social stories:** to help understand social situations, routines and make judgements about a social situation on an individual basis. Details are gathered about a problem situation (the target), the person's abilities, interests and responses, and others involved. These details are used to form a story. The person is given information about the situation and how to respond. Stories can be written, or presented as videotapes or audio tapes for those who cannot read.

**Social skills groups:** including the involvement of competent peers can be helpful to teach social interaction skills. Role-play activities and use of videotapes are helpful in teaching and practising social interaction skills and enable the person with autism to observe his/her behaviour and practice correct responses.

### **6. Pharmacotherapy**

The use of medication should only occur as part of a comprehensive management plan that includes approaches to improving communication, behaviour management, education, social skills training, structuring of daily routine, and parent support.

There is empirical evidence of variable quality regarding the effectiveness of drugs in the treatment of various behaviours, symptoms and psychopathological disorders associated with autism.

Drugs should only be presented after assessment and diagnosis have defined the symptoms or disorder. To some extent the use of any treatment is experimental, therefore when using drugs it is necessary to record baseline and follow up descriptions of the target symptoms, eg using a behaviour checklist in order to demonstrate change. Baseline assessment of abnormal movements helps distinguish these from any later drug induced movements.

Regular inquiry regarding possible side effects is also necessary. Compliance with treatment is improved when the family or carers and the person with autism are involved in regular review of management.

**a. Anxiety.**

- Tricyclic antidepressants (TCA's) (e.g. Imipramine) but not when there is a history of heart disease, due to potential cardiotoxic effects, or epilepsy.
- Selective Serotonin Reuptake Inhibitors (SSRI's) (eg Fluoxetine, Paroxetine, Sertraline). Excitation, disinhibition, nausea and headache may be troublesome side effects.
- Neuroleptics (e.g. Haloperidol, Risperidone, Phenothiazines) in low dose as a last resort due to potential neurological side effects (dystonia, akathisia, dyskinesias), weight gain and rarely blood disorders.
- Buspirone – some limited evidence.

**b. Depression.**

- SSRI's
- TCA's for older adolescence.

**c. Obsessive Compulsive Symptoms.**

- SSRI's
- TCA's particularly Clomipramine and Imipramine but these may unmask epilepsy.

**d. Frustration, Rage, Aggression, Disruptive Behaviour and Withdrawal.**

- Neuroleptics (Haloperidol is the drug of choice)
- Naltrexone – may reduce self-injurious behaviour and hyperactivity. Monitor liver function.
- Anti-convulsants (eg Valproate, Carbamazepine) may improve learning. Monitor liver function.

**e. Cycling Mood Disorder**

- Lithium – requires regular serum level and renal function monitoring. Avoid dehydration. May also reduce self-injurious behaviour and aggression.
- Anti-convulsants (as above)

**f. Attention Deficit Hyperactivity Symptoms.**

- Stimulants (eg Dexamphetamine). Symptoms need to be unequivocal. Frequent side effects (mood disturbance, irritability, worsening hyperactivity, withdrawal and stereotypies, insomnia and tics) limit usefulness.
- Neuroleptics
- TCA's (see above)
- Buspirone
- Naltrexone

### **Some points to remember about treatment:**

- Detailed assessments and behaviour, language, cognitive and social skills baselines must be completed before any treatment programme can begin so that change can be documented.
- Intervention must be sensitive to the realities of the development and skills of each child with autism if it is to be effective. For example, the use of signing is not indicated if the child is unable to imitate or use gesture.
- Given our current state of knowledge, there is not necessarily only one way to manage a child with autism. There may be a variety of different ways of approaching management.
- A multi-modal approach to treatment is more likely to promote development, improve behaviour and reduce stress experienced by the child and family.
- When treating behavioural problems it is important to understand and deal with the underlying causes, antecedents and consequences.

## **ASPERGER'S DISORDER**

### **WHAT IS ASPERGER'S DISORDER?**

One year after Kanner's original paper on autism, Hans Asperger published a paper in 1944 that formed the basis of what was to become known as Asperger's Disorder. Both Kanner and Asperger trained in medicine in Vienna, but unlike Kanner, who moved to the USA, Asperger remained working in Europe.

Asperger and Kanner were apparently unaware of each other's work, probably because of World War II. Asperger's paper remained relatively unknown as it was published in German and was not widely available in translation.

Asperger's paper described a group of children and adolescents who had deficits in communication and social skills, had obsessional interests and behaviour, disliked change and had a dependence on rituals and routines. In addition many were physically clumsy.

Unlike the children described by Kanner, the children in Asperger's paper generally had no significant delays in early cognitive or language development. Asperger described this condition as *autistic psychopathy*.

There has been increasing interest in Hans Asperger and his syndrome over the past twenty years. In the early nineties, Asperger's paper was translated by Frith (Frith, 1991) and became more widely available. Since that time Asperger's Disorder has been more frequently used to describe a group of children who presented with developmental deficits in social skills and behaviour but were difficult to classify.

For the past decade or so there has been a continuing debate as to whether or not Asperger's Disorder is a type of autism or whether it constitutes a separate disorder. Many publications have tried to delineate the boundaries, if any, between autism and Asperger's Disorder.

Despite the differences that can be seen when looking at the original cases described by both Kanner and Asperger, there is continuing confusion over the diagnostic criteria for Asperger's Disorder, particularly as subsequent accounts and case studies have not necessarily adhered to the criteria suggested by Asperger himself. The principal areas of inconsistency relate to early development in the areas of cognition, motor skills and language.

The DSM-IV and the ICD-10 have attempted to introduce a consistent international approach to diagnosis and specify that the key differentiation is that persons with Asperger's disorder do not have delayed language development which is a characteristic of Autistic disorder. Persons with Asperger's disorder have overall normal intellectual ability. Approximately 20% of persons with Autistic disorder also have IQ in the normal range and are referred to as high functioning.

### **HOW COMMON IS ASPERGER'S DISORDER?**

Asperger's Disorder is thought to be more common than autism. Ehlers and Gillberg (1993) studied a population of Swedish children and suggested an incidence of 36 per 10,000 compared with an incidence of about 10 per 10,000 for autism. Because of the lack of diagnostic clarity, estimates of prevalence should be treated circumspectly. It is very likely that mild degrees of Asperger's Disorder may not cause sufficient social, emotional, or mental health problems for recognition to be necessary or even desirable, except perhaps for epidemiological purposes. One of the most reliable current estimates of the prevalence of people with Asperger's Disorder who have needs for a service is that of Fombonne, who concluded that 20 in 10,000 of the general population met accepted criteria for the disorder. The prevalence might be higher in

special populations, for example patients in a high security hospital. One estimate puts the prevalence in one special hospital at 150 per 10,000 (Scragg, P. and Shah, A., 1994).

Some small-scale epidemiological studies suggest that the ratio of males to females is about 10:1.

Both prevalence and gender distribution figures require confirmation by larger-scale epidemiological studies and at this stage are only rough estimates.

## AGE OF ONSET

Asperger's Disorder tends to be diagnosed later than autism in young children. Neither ICD-10 nor DSM-IV stipulate the criteria for age of onset as they do for autism. However, in his original paper, Asperger described children as having difficulties by the age of two.

Parents of young children with autism often recognise problems with behaviour and in particular, language development by about 18 months to two years of age. Because children with Asperger's Disorder do not have delayed early language, or problems with cognitive development, there are few early signs that all is not well. It is more usual for parents to become concerned about their child's emerging unusual or odd behaviour and social development but these tend to be identified later, usually from about 3 to 4 years of age.

Diagnosis of Asperger's Disorder may not occur until the child has attended pre-school or some other early childhood setting such as crèche. This is probably because the child's social and behavioural problems become more noticeable when the child is seen with peers in a more structured social setting where there are more demands for social interaction.

## DIAGNOSIS

In the interest of avoiding confusion for the person, his/her family, clinicians and researchers it is advocated that the DSM-IV / ICD-10 criteria should be applied. One practical answer to the lack of clarity about diagnosis is to break diagnosis down into three steps: 1. Does a person have a pervasive developmental disorder?; 2. Is there a history of delayed language development?; and 3. Is the person of overall normal intellectual ability, i.e. is he or she high functioning? This approach has some advantages. It may be more reliable to diagnose the presence of a pervasive developmental disorder than to make a diagnosis of a specific pervasive developmental disorder. Many professionals use Wing and Gould's triad of social impairments (see Table 1) as a guide to the presence of a pervasive developmental disorder and indeed elements of the triad are apparent in both the ICD-10 and the DSM-IV criteria.

Table 1. ***The triad of social impairments,***  
*adapted from (Wing, L. and Gould, J., 1979)*

<p>Absence or impairment of:</p> <ol style="list-style-type: none"> <li>1. comprehension and use of communication, both verbal and non-verbal</li> <li>2. two-way social interaction</li> <li>3. true, flexible, imaginative activities, with the substitution of a narrow range of repetitive, stereotyped pursuits</li> </ol>
---

Another advantage of this pragmatic approach is that it is needs based. More able people with either high functioning autism or Asperger's Disorder do need very different services than less able people. They are much more self-reflective and are therefore very conscious of their environment. More able adolescents and adults with high functioning autism or Asperger's Disorder may have been sensitised to humiliation and may have consequently become very sensitive to status. They may therefore be very intolerant of receiving help in a mixed group containing people who are much more handicapped than themselves. Finally, more able people with autism or Asperger's Disorder may be capable of considerable or even complete independence and autonomy, and the services that they receive should reflect this.

The presentation and skills of a person with a pervasive developmental disorder may change over time and a less able child may grow into a more able adult. Children with autism and normal intellectual ability will probably develop into adults with adequate language ability although they are still likely to have problems with the social and conversational use of language. In these cases, the diagnosis of high functioning autism would continue to apply. Although adults diagnosed with high functioning autism and those with Asperger's disorder are likely to have a number of features in common, their differing developmental pathways particularly with respect to language development, produce neuro-cognitive and behavioural differences.

The adjustment of a person with a pervasive developmental disorder is the end result of the interaction of various neuro-cognitive disabilities, a person's way of coping with them, and the impact of other people's reactions to them. Applying this 'functional' diagnostic approach leads to a multilevel assessment (see Table 2). The profile of specific disabilities so obtained will distinguish Asperger's Disorder from autistic disorder, but it will also be found that each person will differ slightly and each will therefore have their own personality and profile of strengths and weaknesses.

Table 2. **Multilevel approach to assessment**

<b>Level 1.</b> Examine the patient, obtain systematic developmental information. What developmental disorders are present.
<b>Level 2.</b> Talk to the patient, and a key informant. How have the patient's developmental difficulties been affected by their emotional reactions to them? How have they been influenced by other factors, such as age, intelligence, anxiety levels, co-morbidity?
<b>Level 3.</b> Talk to the patient, talk to a family member, consider other professional reports. How has the patient's reactions to their disabilities been influenced by other people's reactions to them? Has the patient been victimised? What has been the family's expectations of, and reactions to, the patient?

### WHAT CAUSES ASPERGER'S DISORDER?

There is widespread agreement that genetic factors predominate as the primary cause of Asperger's Disorder. Asperger himself noted that in all cases where he studied the family closely, similar traits were found to some degree in parents and other family members. Later studies have found similar autistic traits in the relatives of young people with Asperger's Disorder.

## **CHILDREN AND YOUNG PEOPLE WITH ASPERGER'S DISORDER**

Some examples of how Asperger's Disorder affects children

- Acquisition of language follows a normal or even accelerated pattern, but content of speech is abnormal - pedantic, and may centre on one or two favoured topics.
- Little facial expression, vocal intonation may be monotonous and tone may be inappropriate.
- Impairment in two-way social interaction including an inability to understand the rules governing social behaviour. May be easily led.
- Problems with social comprehension despite superior verbal skills.
- Very rigid, prefer structure.
- Well developed verbal memory skills, absorb facts easily, generally good level of performance at maths and science.
- Highly anxious with a dislike of any form of criticism or imperfection.
- Most attend mainstream schools and are often victims of teasing which causes withdrawal into isolated activities.
- Are seen to be "odd" or "eccentric".

## **ARE THERE ANY DIFFERENCES BETWEEN AUTISM AND ASPERGER'S DISORDER?**

The simple answer to this question is yes. The recent debate as to whether or not the two disorders differ is clouded because clinicians have not used a consistent set of diagnostic criteria to characterise their subject populations when exploring the differences between Asperger's Disorder and autism. This variability of diagnostic assignment has led to a situation where studies examining the validity of Asperger's Disorder as a separate disorder, particularly in contrast to high-functioning autism, cannot be easily compared, or interpreted. This problem can be addressed by the use of the ICD-10 and DSM-IV definitions and diagnostic criteria.

For example a recent study (Tonge, Brereton, Gray and Einfeld, 1999) of high-functioning autism and Asperger's Disorder strictly defined by DSM-IV criteria found that children and adolescents with Asperger's Disorder presented with higher levels of overall psychopathology, were more disruptive, antisocial and anxious, and had more problems with social relationships than the children with high-functioning autism. These differences were not due to any age or global IQ differences.

The finding of high levels of anxiety and disruptive behaviour in the Asperger's group has particular clinical relevance as these psychopathological problems are potentially open to treatment. Anxiety symptoms may be responsive to cognitive behavioural interventions and psychopharmacological treatment. Disruptive behaviours can be modified by educational, environmental and behavioural modification techniques.

In the absence of identifiable neurological damage, neurobehavioural studies have indicated differences between autism and Asperger's Disorder. While there are broad similarities in the clinical (eg. social dysfunction) and neuropsychological (eg. visual-perceptual processing anomalies) features associated with high-functioning autism and Asperger's disorder, recent

research has identified differences in executive functioning, lateralisation and motor ability, supporting the notion of a differing neurobiological basis. For example, a recent series of experiments have indicated that executive functioning, in particular, inhibitory deficiencies, are quantitatively and qualitatively different in autism and Asperger's disorder (Rinehart, Bradshaw et al., 2001a). Individuals with autism had difficulty inhibiting cognitive-motor responses at increasing levels of task complexity. In contrast, individuals with Asperger's disorder performed similarly to age and IQ matched controls. It was noted that a combination of inhibitory and set-shifting deficits may have accounted for performance deterioration in the autism group. Interestingly, past researchers have emphasised only set-shifting, but not inhibitory, deficiencies in autism (Ozonoff & Jensen, 1999). Further, young people with autism are significantly slower at shifting attention from local to global features of a numerical configuration, than those with Asperger's disorder who had no such difficulty (Rinehart, Bradshaw et al., 2001a).

### Motor functioning

Clinical observation suggested that motor clumsiness is a feature which might distinguish Asperger's Disorder from autism (Tantam, 1988). In reviewing the literature, Ghaziuddin, Tsai et al (1992) found that approximately 50% of publications referred to clumsy, uncoordinated movement patterns in either single case studies or group studies of children with Asperger's Disorder. Gillberg (1989) observed that individuals with Asperger's Disorder 'appeared to be generally clumsy', had a 'stiff or awkward way of walking (often without arm-swing)' and were 'uncoordinated in posture and gesture' (p. 528). Recent functional magnetic resonance imaging data has revealed that individuals with autism exhibit less pronounced activation in the primary motor cortex and supplementary-motor-area during a simple finger tapping task than individuals with Asperger's Disorder who do not exhibit a decrease in supplementary-motor-area activity but show a prolonged activation following the movement (Muller, Pierce et al., 2001; Rinehart, Bradshaw et al., 2001b). If the mechanism for terminating motor movement before another is initiated is dysfunctional in Asperger's Disorder, this could account for their clumsiness.

## REFERENCES

- American Psychiatric Association. (1994). *Diagnostic and Statistical Manual of Mental Disorders*. (4th ed.). Washington, DC: American Psychiatric Association Press.
- Asperger, H. Die "Autistischen Psychopathen" in Kindersalter. *Archiv fur Psychiatrie und Nervenkrankheiten*. 117, 76-136. 1944.
- Bailey, A., Phillips, W., & Rutter, M. (1996). Autism: Towards an integration of clinical, genetic, neuropsychological, and neurobiological perspectives. *Journal of Child Psychology and Psychiatry*, 37, 89-126.
- Berument, S. K., Rutter, M., Lord, C., Pickles, A., & Bailey, A. (1999). Autism screening questionnaire: diagnostic validity. *British Journal of Psychiatry*, 175,444-451.
- Bettelheim, B. (1967). *The empty fortress*. New York: The Free press.
- Bishop, D.-V. M. (2000) What's so special about Asperger's Disorder? The need for further exploration of the borderlands of autism.
- Brooks, J., Fos, L. A., Greve, K. W., et al (1999) Assessment of executive function in patients with mild traumatic brain injury. *Journal Of Trauma*, 46, 159-63.

- Carter, C. (2000) Images in neuroscience. Cognition: executive function. *Am J Psychiatry*, 157, 3.
- Cohen, N. J., Vallance, D. D., Barwick, M., *et al* (2000) The interface between ADHD and language impairment: an examination of language, Achievement, and cognitive processing. *J Child Psychol Psychiatry*, 41, 353-362.
- Duffy, J. D. and Campbell, J. J. 3rd (1994) The regional prefrontal syndromes: a Theoretical and clinical overview. *Journal of Neuropsychiatry and Clinical Neurosciences*, 6, 379-87.
- Ehlers, S & Gillberg, C. (1993). The epidemiology of Asperger's Disorder: A total population study. *Journal of Psychology and Psychiatry and Allied Disciplines*, 34,1327-1350.
- Einfeld, S. L., & Tonge, B. J. (1992). *Manual for the Developmental Behaviour Checklist* Clayton, Melbourne and Sydney: Monash University Centre for Developmental Psychiatry and School of Psychiatry, University of N.S.W.
- Evans, J. J., Chua, S. E., McKenna, P. J., *et al* (1997) Assessment of the Dysexecutive syndrome in schizophrenia. *Psychol Med*, 27, 635-46.
- Folstein, S., & Rutter, M. (1977). Infantile autism: A genetic case study of 21 twin pairs. *Journal of Child Psychology and Psychiatry*, 18, 297-321.
- Fombonne, E. (1998). Epidemiological studies of autism. In F. Volkmar (Ed.), *Autism and Developmental Disorders*. New York: Cambridge University Press.
- Fombonne, E. (1999) The epidemiology of autism. A review. *Psychological Medicine*, 29, 769-786.
- Frith, U. (Ed.). (1991). *Autism and Asperger's Disorder*. London: Cambridge University Press.
- Gansler, D. A., Fucetola, R., Kregel, M., *et al* (1998) Are there cognitive subtypes in adult attention deficit/hyperactivity disorder? *Journal of Nervous and Mental Disease*, 186, 776-81.
- Gathercole, S. E. (1998) The development of memory. *Journal Of Child Psychology And Psychiatry And Allied Disciplines*, 39, 3-27.
- Giancola, P. R., Mezzich, A. C., and Tarter, R. E. (1998) Disruptive, delinquent and aggressive behavior in female adolescents with a psychoactive substance use disorder: relation to executive cognitive functioning. *Journal Of Studies On Alcohol*, 59, 560-7.
- Gillberg, C. (1997). *Autism Is More Common Than Once Widely Held*. Paper presented at the Paper presented at the Autism Workshop of the U.S. Centres for Disease Control and Prevention and the National Alliance for Autism Research, Atlanta, Georgia.
- Gillberg, C., & Steffenburg, S. (1987). Outcome and prognostic factors in infantile autism and similar conditions: A population-based study of 46 cases followed through puberty. *Journal of Autism and Developmental Disorders*, 17, 273-287.

- Gillberg, C. (1989). "Asperger's Disorder in 23 Swedish children." Developmental Medicine and Child Neurology **31**(4): 520-31.
- Goode, S., Rutter, M., & Howlin, P. (1994). *A twenty-year follow-up of children with autism*. Paper presented at the 13th Biennial Meeting of the International Society for the Study of Behavioural Development, Amsterdam, The Netherlands.
- Grossman, J. B., Klin, A., Carter, A. S., *et al* (2000) Verbal bias in recognition of facial emotions in children with Asperger's Disorder. *J Child Psychol Psychiatry*, **41**, 369-379.
- Howlin, P. (1998). *Children With Autism and Asperger's Disorder. A Guide for Practitioners and Carers*. Chichester: John Wiley & Sons.
- Kanner, L. (1943). Autistic disturbances of affective contact. *Nervous Child*, **2**, 217-250.
- Kanner, L. (1973). Infantile autism and the schizophrenias. In L. Kanner (Ed.), *Childhood psychosis: Initial studies and new insights* (pp. 123-141). Washington, D.C: H. Winston & Sons.
- Krug, D. A., Arick, J., & Almond, P. (1980). Behavior checklist for identifying severely handicapped individuals with high levels of autistic behavior. *Journal of Child Psychology and Psychiatry*, **21**, 221-229.
- Le Couteur, A., Rutter, M., Lord, C., Rios, P., Robertson, S., Holdgrafer, M., & McLennan, J. (1989). Autism Diagnostic Interview: A standardized investigator-based instrument. *Journal of Autism & Developmental Disorders*, **19**, 363-387.
- Lessing, D. *The Fifth Child*. 1989. London, Paladin.
- Lord, C., Rutter, M. L., Goode, S., Heemsbergen, J., Jordan, H., Mawhood, L., & Schopler, E. (1989). Autism Diagnostic Observation Schedule: A standardized observation of communicative and social behavior. *Journal of Autism & Developmental Disorders*, **19**, 185-212.
- Lovejoy, D. W., Ball, J. D., Keats, M., *et al* (1999) Neuropsychological performance of adults with attention deficit hyperactivity disorder (ADHD): diagnostic classification estimates for measures of frontal lobe/executive functioning. *Journal Of The International Neuropsychological Society*, **5**, 222-33.
- Minshew, N. J., Goldstein, G., and Siegel, D. J. Neuropsychologic functioning in autism: profile of a complex information processing disorder. *Journal of the International Neuropsychological Society*. **3**(4), 303-316.1997.
- Muller, R. A., K. Pierce, et al. (2001). "Atypical patterns of cerebral motor activation in autism: a functional magnetic resonance study." Biological Psychiatry **49**(8): 665-76.
- Ozonoff, S. and J. Jensen (1999). "Brief report: specific executive function profiles in three neurodevelopmental disorders." Journal of Autism and Developmental Disorders **29**(2): 171-177.

- Prior, M., & Tonge, B. J. (1990). Pervasive developmental disorders. In B. J. Tonge, G. D. Burrows, & J. Werry (Eds.), *Handbook of Studies in Child Psychiatry* (Vol. 1st, pp. 193-208). Amsterdam: Elsevier.
- Rinehart, N. J., Bradshaw, J.L., Moss, S., Brereton, A. V., Tonge, B.J. (2001a). A deficit in shifting attention in high-functioning autism but not Asperger's disorder. *Autism: Research & Practice*, 5(1), 67-80.
- Rinehart, N. J., Bradshaw, J.L., Brereton, A. V., Tonge, B.J. (2001b). Movement preparation in high-functioning autism and Asperger's disorder: A serial choice-reaction time task involving motor reprogramming. *Journal of Autism and Developmental Disorders*, 31(1), 79-88.
- Russell, J., Jarrold, C., and Hood, B. (1999) Two intact executive capacities in children with autism: implications for the core executive dysfunctions in the disorder. *Journal Of Autism And Developmental Disorders*, 29, 103-12.
- Rutter, M. (1983). Cognitive deficits in the pathogenesis of autism. *Journal of Child Psychology and Psychiatry*, 24, 513-531.
- Schopler, E. (1996). Are Autism and Asperger's Disorder (AS) Different Labels or Different Disabilities?, *Journal of Autism and Developmental Disorders* 26 (1): 109-110.
- Schopler, E., Reichler, R. J., Bashford, A., Lansing, M. D., & Marcus, L. M. (1990). *Individualized assessment and treatment for autistic and developmentally disabled children: Psychoeducational Profile Revised (PEP-R)*. Austin, TX: Pro-ed.
- Schopler, E., Reichler, R. J., DeVellis, R. F., & Daly, K. (1980). Toward objective classification of childhood autism: Childhood Autism Rating Scale (CARS). *Journal of Autism & Developmental Disorders*, 10, 91-103.
- Scragg, P. and Shah, A. Prevalence of Asperger's Disorder in a secure hospital [see comments]. *British Journal of Psychiatry*. 165(5), 679-682. 1994.
- Stone, W. L. (1997). Autism in infancy and early childhood. In Cohen, D. J. & Volkmar, F.R. (Eds.), *Handbook of Autism and Pervasive Developmental Disorders*, (2nd ed. pp 266-282). New York: Wiley.
- Tantam, D. (2000) Asperger's Disorder in adolescence and adulthood. In *Asperger's Disorder* (eds A. Klin, F. Volkmar, & S. Sparrow), pp. 367-402. New York.
- Tantam, D. (1988). "Annotation: Asperger's Syndrome." *Journal of child Psychology and Psychiatry* 29(3), 245-255.
- Tantam, D., Holmes, D., and Cordess, C. Nonverbal expression in autism of Asperger type. *Journal of Autism and Developmental Disorders*. 23(1), 111-133. 1993.
- Tonge, B. J., Brereton, A. V. Gray, K. M., & Einfeld, S. L. (1999). Behavioural and emotional disturbance in high-functioning autism and Asperger's Disorder. *Autism: The International Journal of Research and Practice*,(3) 2:117-130.

Venter, A., Lord, C., & Schopler, E. (1992). A follow-up study of high-functioning autistic children. *Journal of Child Psychology & Psychiatry & Allied Disciplines*, 33(3), 489-507.

Wechsler, D. (1989). *Wechsler Pre-school and Primary Scale of Intelligence-Revised*. San Antonio: The Psychological Corporation.

Wing, L. (1988). Autism: Possible clues to the underlying pathology.1: Clinical facts, *Aspects of autism: Biological research. Gaskell psychiatry series*. (L.Wing, Ed.), pp. 1-10. London: Gaskell.

Wing, L. and Gould, J. Severe impairments of social interaction and associated abnormalities in children: epidemiology and classification. *Journal of Autism and Developmental Disorders*. 9, 11-29. 1979.

World Health Organisation. (1992). *ICD-10: Classification of mental and behavioural disorders. Clinical description and diagnostic guidelines*. Geneva: World Health Organisation.