CHAPTER I

INTRODUCTION
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1.0 Autism

Autism Spectrum Disorder (ASD) is characterised by repetitive and restrictive interests, problems with communication, and impaired social functioning (American Psychiatric Association, 1994). ASD affected 9 in 10,000 individuals (Fombonne, 2003). It is three times more likely to occur in males than in females (Burd, Fisher, & Kerbeshian, 1987). Although no cause has been identified, many behavioural theories of ASD describe it as social disorder. For example, research shows that those with ASD have poor Theory of Mind (ToM) (see reviews by Baron-Cohen, 2000). ToM is important for being able to understand the thoughts and feelings of others and normally develops between the ages of 3 and 5 years old (Wellman, 1993). Poor ToM may explain why those with ASD have problems identifying the emotions conveyed by other people’s facial expressions and why they find it difficult to interact in meaningful ways with others.

The defining characteristics of autism were first described by Kanner (1943, pp. 242-246) in relation to a group of 11 institutionalised children whose behaviour he observed to be marked by “extreme autistic aloneness, an anxiously obsessive desire for the preservation of sameness, excellent rote memory, delayed echolalia, and limitations in the variety of spontaneous activity”. With specific regard to social interaction, Kanner (1949, p.416) further noted that the individuals with autism whom he had observed showed either “profound withdrawal from contact with people” or “mutism or the kind of language that does not seem intended to serve the purpose of interpersonal communication”. In recent years, autism has been placed together with Asperger Syndrome (AS) and Pervasive Developmental Disorder- Not Otherwise
specified (PDD-NOS), within the broad classification of Autistic Spectrum Disorder (DSM-IV; American Psychiatric Association, APA, 1994). Although people with autism share a range of core symptoms, the severity and the exact nature of symptoms displayed vary widely between individuals. ASD currently affects approximately one in every 68 individuals (CDC, 2014). It is the most commonly diagnosed developmental disorder.

There is no unanimity on what defines autism. Its diagnostic conceptualization has been periodically changing. Beginning its exclusion in DSM-I (1952) and DSM-II (1968), when children exhibiting autism-like symptoms were diagnosed as ‘schizophrenic reaction’ or ‘childhood schizophrenia’, the term ‘Infantile Autism’ was first included as diagnostic category in DSM-III (1980) by listing six mandatory symptoms. Simultaneously, the ICD-8 (1967) also identified ‘infantile autism’ and classified it as subgroup of schizophrenia. The ICD-9 (1978) classified it as childhood psychoses. The initial version of DSM-IV (1987) dropped the prefix ‘infantile’. Until 1970s, language impairment was seen as the major defining feature of autism (Rutter, 1971). It was diagnosed essentially as a severe form of language impairment. This was abandoned when it became evident that some of these individuals had social impairments despite having excellent language skills. The later version of DSM-IV (1994) allowed a ‘Pervasive Developmental Disorder-Not Otherwise Specified’ diagnosis for anyone with significant impairment in any one of three domains: social, communication or repetitive and stereotyped behaviors. Correspondingly, ICD-10 (1993) added diagnostic conditions like atypical autism, overactive disorder associated with mental retardation and stereotyped movements with a criteria insisting on absence of social impairment. The DSM-IV-TR (2002)
insists on exhibiting at least six symptoms including two symptoms of qualitative impairment in social interaction, one symptom of qualitative impairment in communication and one symptom of restricted and repetitive behavior. To cap it all, the oncoming changes in diagnostic criteria under DSM-V (2013) and ICD-11 (2015) without attempts to harmonize between them will have significant implications for clinical practice (First, 2009; Jablensky, 2009).

While the defining characteristics of autism are far from being resolved, considerable effort has also gone into identifying the causes of autism. Since Kanner’s (1943) initial description of the disorder (Freitag, 2007), no biological marker or biomedical test is yet available as a diagnostic tool. Diagnosis still depends solely upon clinical observation of specific patterns of behaviour common to all individuals with autism. According to DSM-IV (APA, 1994), a diagnosis of autism can be made when an individual shows qualitative impairments in both social interaction and communication, with restricted repetitive and stereotyped patterns of behaviour, interests, and activities. It should be noted that intellectual disabilities are also common among individuals with autism. The current estimates indicate that approximately 75% of such individuals show some degree of intellectual impairment (Baird et al., 2006; Fombonne, 2005).

Present-day autism researchers and clinicians increasingly emphasize the heterogeneity of autism (Waterhouse, 2013). Lord and Jones (2012) recently stated that ‘the most significant scientific challenge to the concept of autism as one “disease” or even “diseases” is the heterogeneity of the genetic findings’ (p. 491). Even though autism is considered to be ‘among the most heritable of all mental disorders’
(Lichtenstein et al., 2010) and reviews estimate the heritability of autism to be more than 90% (Losh et al., 2008; Frietag et al., 2010), the search for autism genes turned out to be extremely complex. These studies illustrate that there are many genetic mutations associated with autism that are very rare. The number of genes associated with autism may be a couple hundred or more, of which the most common mutations were found in just over 1% of the children with autism, and not exclusively in children with autism (Verhoeff, 2012; Schaaf & Zoghbi, 2011).

Rates of ASD among relatives of probands are higher than in general population and monozygotic twins have a higher rate of concordance (50 percent for diagnostic concordance and 92 percent for concordant features of ASD) (Bailey et al., 1995). These findings suggest that a combination of genetic and environmental factors is involved.

Neurobiological differences, including irregularities in head circumference, brain volume, corpus callosum, hippocampus, amygdale, cerebellum, and the parietal lobes, have been noted in individuals with ASD (Courchesne et al., 2001; Fidler et al., 2000; Hass et al., 1996; Harden et al., 2000; Kemper & Bauman, 1998). Further, although brain volume differences were noted for young children, this was not the case for adolescents or adults (Aylward et al., 2002). Despite these contradictions, there has been more consistent support to show that there are developmentally linked increase in brain volume and reduced sizes of corpus callosum, indicating that these structural abnormalities may in fact be linked to development of ASD (Nicolson & Szatmari, 2003).

Although all individuals with autism share a range of behavioural characteristics, the extent of individuals’ deficits, and the impact these have on their
learning, vary greatly. With regard to language and communication, for example, many individuals with autism do not learn to produce spoken language during childhood and fail to compensate through use of alternative modes of communication such as gestures or mime (APA, 1994). It has further been estimated that 50% of individuals with autism never develop spoken language (Bryson, Clark, & Smith, 1998). And, of those who do, language use is typically characterised by a high frequency of stereotyped and repetitive phrases (i.e., echolalia) and marked impairments in the ability to initiate or sustain conversation with others in a social environment (APA, 1994).

Like the early history of diagnostic issues in autism, prevailing societal views and theories (e.g., psychodynamics, physiological, etc.) have greatly influenced treatments for people with autism symptoms (Jacobson, 2005; Scheerenberger, 1983). For example, during periods of history when demonic possessions were current rage, people with intellectual disabilities were exposed to exorcisms and prayer treatments (Scheerenberger, 1983). When psychodynamic theories reigned, treatment unsuccessfully involved attachment and “rebonding” of the mother and child (Bettelheim, 1967; Lovaas, 1987; Schreibman & Ingersoll, 2005).

Teaching skills and reducing inappropriate behaviour for people with autism involved a variety of behavioural techniques based upon operant and respondent learning (Cooper et al., 2006). Some of these behavioural interventions for teaching people with autism included: (a) making environmental changes, such as providing structure and reducing distraction in teaching situations; (b) Using specific prompts and prompting strategies (e.g., modelling, gestural, mechanical, etc.); (c) requiring repeated practice behaviours (e.g., DTI); (d) employing reinforcement for correct
responses; (e) decreasing behaviour through reinforcement manipulation and punishment procedures; (f) implementing naturalistic teaching (e.g., incidental learning, delayed cued prompting, etc.); (g) using task analysis, chaining, and shaping to teach new skills; (h) planning for generalization and maintenance; and (i) exposing children to typical learning environments based on skills (Cooper et al., 2006; Foxx, 1982a,b).

A multitude of therapies and remediation protocols are being made available for the beleaguered parents, caregivers and the affected children with autism. Some well known canned and copyrighted programs (to list only a few) are: Strategies for Teaching Based on Autism Research (STAR), Discrete Trial Training (DTT), Pivotal Response Teaching (PRT), Picture Exchange Communication System (PECS), Applied Verbal Behavior (AVB), Autism Intervention Program of Eastern Ontario (AIP-EO), Positive Behavior Supports (PBS), etc.

In a study on netizen searches in a virtual group covering nearly 3500 email transactions, results showed that the participant parents reported greatest concerns regarding therapy, treatment and management techniques (49.39 %; Rank 1) for their wards identified as autism. This was followed by other concerns, such as, on or about their behavior problems (43.31 %; Rank 4), consulting (42.61 %; Rank 5); peer approval (35.62 %; Rank 6), causes (31.69 %; Rank 7), diagnostic clarifications (31.64 %; Rank 8) and least regarding issues on advocacy (17.49 %; Rank 15). In the same study, parents attributed the cause of autism in their children to biological (493/1089; 45.27 %), diet-based (341/1089; 31.31 %), environmental (169/1089; 15.51 %) and/or sensory (86/1089; 7.90 %) factors. More significantly, the study reported that the parents followed therapies which were nutrition based (51 types; 27.05 %),
biomedical (24 types; 19.86 %), education-behavior based (40 types; 16.91 %), sensory (50 types; 11.73 %), alternative medicine systems (40 types; 11.14 %), medication/drugs (24 types; 7.84 %) or instrument based (9 types; 5.48%). The study counted that the parent searches covered nearly 250 forms or types of therapy for ameliorating their affected children with autism (Venkatesan & Purusotham 2008).

Currently, no definite cure for autism exists. Educational interventions provide the only means for individuals with the disorder to acquire essential intellectual and social skills (National Research Council, NRC; 2001). A variety of such interventions have been developed as a means of remediating the characteristic deficits of autism. Although these vary widely in terms of underlying philosophy and teaching methods employed, a general consensus exists that intervention should begin in the pre-school years, focus on teaching a range of skills, and take place for a minimum of 25 hours per week (NRC, 2001).

Recent studies (Eikeseth, 2008; Howlin, Magiati & Chairman, 2009; Rogers & Vismare, 2008) have compared the outcomes of a range of the early interventions available for autism through comprehensive review of research reporting intervention outcome data. The results of all studies included were based on standardised assessments. All participants were below 6 years of age at intake, and received comprehensive psycho educational interventions for a minimum of 12 hours per week for a minimum of 12 months. On the basis of research evidence reviewed, all three papers independently concluded that interventions based on the principles and techniques of ABA produced the greatest gains in intellectual functioning and skills acquisition in individuals with autism.
1.1 Problem Behaviours in Autism

Problem behaviours of children with ASD are amongst the most challenging and stressful issues faced by schools and parents in their efforts to provide appropriate educational programs. Problem behaviours such as property destruction, physical aggression, self injury, and tantrums are major barriers to effective social and educational development (Riechle, 1990; Horner et al., 2000). Such behaviours put young children at risk for exclusion and isolation from social, educational, family, and community activities (Sprague & Rian, 1993). In addition, problem behaviours may place an onerous burden on families, particularly as children grow from preschool into school age (Bristol et al., 1993).

The definition of problem behaviours depends on whether the behaviours are considered from the perspective of a child with an ASD or from the perspective of a parent or teacher. From a child’s perspective, problem behaviours include the inability to understand demands of a classroom or a parent and to communicate his or her needs and wants, severe difficulty in initiating and maintaining social interactions and relationships, confusion about the effects and consequences of many of his or her behaviours, and engagement in restrictive and repetitive behaviours and interests that may limit the child’s ability to learn and to fit in with peers. From a teacher’s or parent’s perspective, problem behaviours include lack of compliance with or disruption of classroom routines, tantrums, destruction of property, and aggression against self or others.
Most behaviour problems displayed by young children with ASD are “normal” behaviours in that they may be observed, albeit at lower frequency, in typically developing children. However, in ASD, the intensity, frequency, duration, or persistence of the behaviours distinguish them from similar behaviours of normally developing young children.

Understanding what causes these problem behaviours to emerge during the early childhood and preschool years, what maintains them, and what evokes their moment-to-moment expression holds promise of treatments to prevent them from becoming permanent and abnormal (Berkson & Tupa, 2000). Once moderate to severe problem behaviours become an established part of a child’s repertoire, unlike children with typical development, children with ASD or other disabilities do not usually out-grow them. Without appropriate intervention, these behaviours persist and worsen (Schroeder et al., 1986).

Epidemiological studies indicate that a substantial minority of all young children, with or without developmental disorders, exhibit problem behaviours at some time that might benefit from intervention (Emerson, 1995; McDougal & Hiralall, 1998). Young children with poor social skills or limited communication, including children with autistic spectrum disorders, are especially at risk for such problems (Koegal et al., 1992; Borthwick-Duffy, 1996).

Shared core deficits in the areas of communication, social behaviour, and excessive repetitive behaviour may predispose children with ASD to display problem behaviour. That is, problem behaviour may result from deficits in children's ability to
express their needs, desires, and preferences, or to understand and respond to naturally occurring social cues and norms (Hagopian, & Graham, 2009). Additional to biological factors that increase the risk of problem behaviour, many environmental factors can lead to the emergence and maintenance of problem behaviour. Reactions of caregivers to regularly used with typically developing children to deal with problem behaviour could inadvertently strengthen or reinforce that problem behaviour in children with autism. For example, giving a child a break from work when he becomes upset or disruptive may inadvertently strengthen those problem behaviours that are related to working.

Hagopian and Graham (2009) also stated in their article that many children with autism don't display problem behaviours that may require immediate treatment by a professional. However, given the increased risk for problem behaviour in autism, it is important to be proactive. It is important for parents to understand that many of the same principles important for dealing with behavioural issues in typically developing children are applicable to children with autism. However, the responsibility on parents (and teachers) of children with autism is even greater because they must take on a more active role in "engineering" the optimal environment, and in teaching adaptive skills that seem to develop naturally in children without disabilities.

On the contrary, if a given problem behaviour is relatively minor, occurs infrequently, and poses no risk to the individual or others, then it simply should be ignored and the child redirected with minimal attention. Stereotypic behaviours such as hand flapping, finger snapping, or rocking side to side, that some parents find
embarrassing, generally are best ignored -- unless the behaviour occurs excessively to
the point of interfering with participation in routines or schoolwork (Hagopian &
Graham, 2009). When problem behaviour is severe enough to place the child or others
at risk for injury or to interfere with participation in school and family activities, then
treatment by a professional is needed. Both behavioural treatments and medication
should be applied at a level that is appropriate to the scope of the problem. More
severe problem behaviour can include the following: self-injurious behaviour (for
example, hitting, biting, or scratching oneself), aggression toward others, destructive
behaviour, screaming, and pica (that is, eating inedible objects). The severity of these
problems can vary widely, ranging from relatively minor and short-lived, requiring
little treatment, to severe and chronic, necessitating intensive intervention. These
behavioural problems can stem from biological or environmental factors, or a
combination of both.

The presence of problem behaviours in children with developmental
disabilities is frequently shown to be 4-5 times higher than in matched controls of
unaffected children (Baker et al. 2002; Crnic et al. 2004; Mazzucchelli & Sanders,
2011). Irrespective of behaviour problems being attributed to biological or
constitutional factors, family stress, and/or the children’s developing self regulatory
capacities (Vrijmoeth et al. 2012), their objective identification is an integral part of
any comprehensive behavioural remediation program for children with developmental
disabilities.

Despite occasional distinctions being made, the commonly used synonyms
for the term problem behaviours are negative, undesirable, maladaptive, or
challenging behaviours. Hewitt and Jenkins (1946) classified problem behaviours as
‘over inhibited’, ‘under socialized aggression’, and/or ‘socialized delinquent’. Achenbach (1983) distinguished ‘externalizing’ and ‘internalizing’ behaviour disorders. Internalizing problem behaviours are inner directed maladaptive actions distressing to the person manifesting them. For example, head banging or biting oneself is an inner directed self injurious internalizing behaviour. Sometimes, internalizing behaviours are covert or not externally observable, such as anxiety, fears, depression, eating and sleeping or psychosomatic disturbances. Externalizing problems are, by contrast, outwardly-directed maladaptive actions disturbing others more than the person who is showing that behaviour. For example, when a child turns violent and hits others or throws things, it poses danger and stress on others. Such behaviours are overt and easily discernable, such as, Attention Deficit and Hyperactivity, Conduct Disturbances, Substance Abuse, etc. Studies have shown that internalizing type of behaviour disturbances are short lasting compared to long lasting effects on personality of the individual for externalizing behavioural disturbances (Campbell, Shaw & Gilliom, 2000).

1.2 Adaptive Skills

Adaptive behaviours refer to a person’s social responsibility and independent performance of daily activities. Toilet training and associated issues have been focus of a broad range of early interventions. For example, behavioural interventions for toilet training have been based upon principles of both operant and classical conditioning (Azrin et al., 1971; Azrin & Foxx, 1971, 1974; Mahoney et al., 1971).
Although the range of adaptive behaviours can be defined more or less broadly, virtually all categorisations include a focus on self-care skills related to basic biological functions. In addition to issues of toileting, eating and sleep disorders are frequently reported in children with autism. Other adaptive behaviours pertain to home and community living skills, with applicable areas for young children including dressing, grooming, and safety related behaviours. A broader perspective on adaptive behaviours may expand to school related skills, such as academic behaviours (McGee et al., 1986), play skills (Haring, 1985), or overall engagement with work materials or the social environment (McGee et al., 1997). Not surprisingly, there are correlations between levels of adaptive skills and intellectual ability (Carter et al., 1996).

Assessment of adaptive functioning is particularly important for children with autism for several reasons. First, measures of a child’s typical patterns of functioning in familiar and representative environments, such as home and school, can be obtained. Assessment of adaptive skills provides a measure of a child’s ability to generalize teaching across settings; given the nature of the cognitive difficulties in generalization in ASD, such assessments are especially important. As with other children with developmental difficulties, acquisition of basic capacities for communication, socialization, and daily living skills are important determinants of outcome. Significant discrepancies, for example, between performance in a highly structured setting and in less structured settings, or between intellectual skills and adaptive abilities, indicate the importance of including an explicit focus on teaching such skills and encouraging their generalization across settings. Adaptive skills may be in marked contrast to a child’s higher ability to perform in one-on-one teaching situations or in highly structured behavioural programs.
Second, assessment of adaptive behaviours can be used to target areas for skills acquisition. Third, there is some suggestion that relatively typical patterns of performance in ASD can be identified and that some aspects of adaptive assessment (e.g., of social skills) can contribute to a diagnostic evaluation (Loveland & Kelley, 1991; Carter et al., 1998). Forth, assessment of adaptive skills, as well as intellectual ability, is essential in documenting the prevalence of associated mental retardation and thus, eligibility for some services (Sparrow, 1997).

1.3 Skill Behaviours in Autism:

Autistic deficits cluster into three groups: communication related, social deficits and physical deficits. Communication deficits include people with autism’s difficulty using spoken language and gestures, inability to initiate and sustain appropriate conversation and use of inappropriate and repetitive language. Social deficits manifest as people with autism’s tendency towards isolation, difficulty in making eye contact, inability to develop inappropriate peer relationships and apparent lack of empathy. Physical deficits take the form of stereotyped repetitive movements and unusual body posturing.

Physical skill:

The majority of infants with autism attain basic motor milestones “on time” (Johnson et al., 1992; Rapin, 1996a). Some of the evidence suggests that, based on parents’ reports, sensory perceptual abnormalities may be among some of the first signs of autism. Lack of responsiveness to certain sounds, hypersensitivity to the taste
of foods, and insensitive to pain are more commonly seen in infants with autism than in typical infants with other developmental disorders (Hoshino et al., 1982).

**Sensory:**

Children with autism tend to have extreme reactions to sensory stimulation. Their senses may become hypersensitive (over sensitive) or hyposensitive (under-sensitive). Hypersensitive children find themselves overloaded with even moderate levels of sensation, and work block out sensory input such as light, sound and touch. Hyposensitive children, on the other hand, are not stimulated enough by normal sensory inputs and typically seek out extra stimulation. To illustrate, children who are hypersensitive to touch, sensations may tantrum when they are touched, while hyposensitive children may crave and seek out strong hugs that provide deep pressure (Reynolds, & Dombeck n.d).

These children with autism also suffer from problems in the sensorimotor functions, and more so for children with autism having lower cognitive function (Noterdaeme, Mildenberger, Minow, & Amrosa, 2002; Rapin, 1996b). Children with autism may also display synaesthesia, a neurologically-based syndrome where sensations become confused with one another. Sounds may be experienced as touches, for example, or as a visual stimulation. For example, children with autism may cover their eyes, when they hear a loud sound.
Fine Motor:

Movement skills are typically divided into two categories: gross motor skills and fine motor skills. Gross motor skills involve large scale coordinated activities such as walking, while fine motor skills involve detail oriented activities such as drawing, sewing or playing a musical instrument. Although the basic motor skills of children with autism are often reported to be an area of relative strength, numerous studies also provide evidence that motor problems may sometimes be quite significant. Specific deficits have been reported, including in motor imitation, balance, coordination, finger to thumb opposition, speech articulation and presence of hypotonia. Children with autism frequently show developmental delays in developing fine motor skills. While some children enjoy fine motor activities like lacing their shoes or coloring, others become very agitated when directed to complete fine motor activities. Writing is especially troublesome for some children. Many choose to use a keyboard rather than writing things out by hand (Reynolds, & Dombeck n.d).

Deficits in fine motor activities in children with autism tend to interfere with their need to engage in stereotyped repetitive movements and self-stimulatory behaviours. Children with autism having hypo-sensitivities to sensory stimulation frequently feel under-stimulated, and engage in a array of self-stimulation behaviours such as hand flapping or rocking just to help themselves feel more 'normal'. Likewise, hypersensitive children may engage in self-stimulation as a means of blocking out otherwise overwhelming environmental stimulation. In either case, children with autism find it aversive to be prevented from self-stimulating by the need to
concentrate on tasks and are likely to resist efforts to motivate them to complete such
tasks (IDEA, 1999).

Self-stimulation behaviours are often varied in nature. In addition to hand
flapping and rocking, children with autism may engage in visual self-stimulatory
behaviours. They may squint their eyes, or otherwise defocus their eyes to create odd
visual sensations. Alternatively, they may engage in "sighting"; repetitiously focusing
closely on an object, then pulling away, and then repeating the process over and over.

**Gross Motor:**

Children with autism commonly have difficulty walking naturally. For
instance, they may "toe-walk", stepping only on the front portion of their feet, in place
of a normal relaxed walking pattern. This practice may lead to irregular muscle
development in the calves (Ming, Brimacombe, & Wagner, 2007).

Many children with autism do not develop a normal sense of themselves in
relation to their environments. They lack awareness of where their bodies are in
relation to their surroundings. As a result, some of these children become accident-
prone and tend to bump into objects. However, many individuals with autism who
demonstrate superior gross motor skills and balance, even though they lack body
Communication:

Research over the past decade has identified core communication deficits in children with autism that fall into two major areas; joint attention and symbol use (Dawson et al., 1990; Kasari et al., 1990; Mundy et al., 1990; McArthur & Adamson, 1996; Stone et al., 1997; Wetherby et al., 1998; Sigman & Ruskin, 1999). Joint attention reflects difficulty coordinating attention between people and objects and is evident by deficits in orienting and attending to a social partner; shifting gaze between people and objects; sharing affect or emotional states with another person; following the gaze and point of another person; and being able to draw another persons’ attention to objects or events for the purpose of sharing experiences.

Symbol use reflects difficulty learning conventional or shared meaning for symbols and is evident in deficits in using conventional gestures; learning conventional meaning for words; and using objects functionally and in symbolic play. Similarly children with autism do not compensate for their lack of verbal skills with gestures; they show limited gestural use, both in quantity and quality. They predominantly use primitive motoric gestures to communicate (i.e., leading, pulling or manipulating another’s hand). They lack the use of many conventional gestures, such as showing, waving, pointing, nodding the head and symbolic gestures depicting actions (McHale et al., 1980; Loveland & Landry, 1986; Stone & Caro-Martinez, 1990; Stone et al., 1997; Wetherby et al., 1998).

In lieu of conventional means of communicating, children with autism may develop idiosyncratic, unconventional, or inappropriate behaviours to communicate,
such as self-injurious behaviours, aggression, or tantrums. Despite the fact that at least 50 percent of individuals with autism display some functional speech and language skills (Lord & Paul, 1997), the challenging behaviours such as aggression, tantrums and self injury are often used to procure attention, to escape from task or situation, to protest against changes of schedule and routine, or to regulate interactions in a predictable manner. Carr and Durand (1985) reported that aggression, tantrums, and self-injury were more likely to occur in situations with high level of task difficulty and low level of adult attention.

**Sound Perception:**

Children with autism do not respond to sound appropriately. For example, many do not respond when others call their names. They may cry inappropriately as a reaction to normal sounds, or they may be completely indifferent to unusual or loud noises. Parents tend to notice these oddities of perception first, before any other symptoms of autism are identified. Many parents of children with autism initially mistake these perceptual issues for problems with hearing.

It is common for these children to confuse speech sounds, especially hard consonants. They may not be able to distinguish between the sound "ba" and "ka", for instance. As a result, words like "bat" and "cat" may sound identical to some children with autism. Many hear only the first part of a word or the last part of a word, making words like "rectangle" and "triangle" indistinguishable. Many of them are not able to parse spoken language (e.g., recognize that sentences are made up of separate words).
They may also blend words together so that the phrase "ready, set, go" might end up as "redsetoe".

**Language Development:**

Children with autism have difficulty understanding spoken words. They have trouble relating words to objects and activities. Abstract words are extremely challenging because they are not linked to something tangible that can be inspected and pointed to. For example, the word "from" has no meaning to autistic people. Without concrete visual connections to objects or activities, words are nearly impossible for them to understand (Lal & Shahane, 2011).

Language is not spontaneously acquired in autism. The inability to process sounds properly profoundly interferes with language development. Traditional methods for teaching language take for granted children's ability to spontaneously make associations between sounds and concepts and to learn how to form sentences by mirroring and are thus not adequate or useful. These assumptions are, unfortunately, not true for autism. Instead, children with autism must learn language as a rigorous intellectual exercise. Verbal and nonverbal aspects of language all have to be taught deliberately and systematically. Nouns must be taught by direct reference to the things they signify. All children require this sort of association in order to learn how to read, but autistic children require it in order to learn how to speak. Likewise, other parts of speech such as prepositions and pronouns have to be introduced purposefully and as visually as possible. The entire process of language acquisition
becomes a gigantic undertaking, instead of the natural and relatively effortless process. (Reynolds & Dombeck, n.d).

Children with autism tend to use the language they do learn in odd ways. A common and odd practice is echolalia. Echolalia is a verbal behaviour in which children with autism repeat what they hear over and over and over again. Echolalia is not uncommon behaviour in normal language development. However, typically when children echo phrases and words, they do so for a social purpose. In contrast, children with autism repeat phrases, words or whole paragraphs without the intention of interacting or communicating with other people (https://prezi.com/mhdefufmcpq/autism-and-aspergers-2/).

Nonverbal forms of language are also negatively affected by autism. Children with autism have great difficulty understanding nonverbal forms of communication. They don't recognize the meaning inherent in other people's facial expressions, for example, and they don't learn to use facial expressions to convey meaning. Children with autism often have blank expressions or they make inappropriate expressions. They do not instinctively know that a frown represents displeasure or that a smile communicates pleasure. In a normal developmental process the meanings of such facial expressions are picked up spontaneously as language is acquired. This does not happen in autism. Any recognition of the meaning of nonverbal expressions must be explicitly taught.
Social and Empathy skills:

One of the characteristics of autism is lack of empathy and emotional engagement with others (APA, 2000). Empathy relates to the ability to recognise, share and understand emotions of others. Children with autism, have trouble keeping track of other’s intentions, beliefs, knowledge and desire. They don't recognize and respond to faces as normal children do, and they thus do not learn that each face belongs to an individual separate person. To the children with severe autism, their own feelings and ideas are the only feelings and ideas that appear to exist. Children with autism may have no reaction to another person's crying, for example. They may have no idea that their words and actions affect other people. Many children with autism are completely unaware of their surroundings and other people in their surroundings. It is impossible for some children with autism to take another person's perspective without deliberate training (Gables, 2012). Lack of empathy is a very early sign of autism. Deficits in empathic behaviour have been shown as early as 20 months of age in children with autism (Sigman, Kasari, Kwon & Yirmiya, 1992; Charman et al., 1997).

Given their empathy and communication deficits, these children experience the social world as unpredictable and frightening. They find social interactions to be unnatural and quite stressful. Rather than embracing relationships, they try to avoid them, choosing rather to take refuge and comfort in their own isolated worlds. They do not reciprocate play and they do not engage in normal play activities without prompting. They also avoid meeting other people's gaze, and tend instead to fixate their eyes away from people, on to inanimate objects or parts of objects (Kuba, 2014).
When higher functioning children with autism choose to be social, their deficits in understanding the social world and empathy prevent them from engaging with others. For example, a high functioning child with autism may know he is supposed to use words to initiate a conversation with other children, but not know quite how to use them appropriately. Correspondingly, s/he may walk up to a group of children and attempt to initiate a conversation by echoing an out-of-context phrase heard previously, such as, "It was a dark and stormy night" rather than by making eye contact and saying hello. Though well intentioned, such odd behaviour is, of course, quite baffling to children who don't already understand about autism.

**Play**

Children with ASD often exhibit a restricted or limited range of interests and play materials. They may show a persistent preoccupation with parts of objects (the spinning wheels of toy cars), an attachment to unusual objects (a toy wheelbarrow), or fixation with a narrow interest (such as numbers or letters) (http://www.fraser.org/Resources/Fraser-Expertise---Information/Developing-Interests-and-Play-Skills-for-Children, 2014). Often, children with autism will demonstrate a great and odd knowledge in remembering locations, places, numbers, or letters. These very specific interests will make it difficult for the child to engage in purposeful play alone or with peers, as well as adjust to changes in routines or changes in the physical environment around them. Some play behaviours of concern:

- Lining up, spinning or stacking objects
- Excessive feeling of textures
• Lack of imitation
• Need for perfectionism
• Insistence that the environment or routine remain unchanged
• Lack of safety awareness with play materials (climbs too high)
• Does not understand ‘cause and effect’
• Repetitive play

Evidence of a deficit in the symbolic capacity in autism is the ability to develop symbolic or pretend play. Although play is a social-cognitive skill, a lack of varied, spontaneous make-believe play is one of the four possible features of the impairment in communication in DSM-IV. Children with autism show significant deficits in symbolic or make-believe play (i.e. using pretend actions with objects) and limited abilities in functional play (i.e., using objects functionally). Functional and symbolic play skills have been found to be significantly correlated with receptive and expressive language (Mundy et al., 1987; Sigman & Ruskin, 1999). In contrast to deficits in functional object use and symbolic play, children with autism often perform at similar or sometimes even higher levels on non-social constructive play (e.g., using objects in combination to create product, such as putting puzzle together) in comparison with typically developing children (Wetherby & Prutting, 1984; Wetherby et al., 1998).
Cognitive Skills:

In his original paper, Kanner (1943) commented on the intelligent appearance of children with autism and observed that they did well on some parts of tests of intelligence. As the time went on, it became apparent that, although some areas of intellectual development were often relatively strong, many other areas were significantly delayed or deviant in their development and that probably a majority of children with autism functioned in the mentally retarded stage.

He also added that children with ASD have unique patterns of development, both as a group and as individuals. Many children with ASD have relative strengths that can be used to buttress their learning in areas that they find difficult. For example a child with strong visuo-spatial skills may learn to read words to cue social behaviour. A child with strong non-verbal problem solving skills may be motivated easily by tasks that have a clear end point or that require thinking about how to move from one point to another.

Autistic spectrum disorders are disorders that affect many aspects of thinking and learning. Cognitive deficits, including mental retardation, are interwoven with social and communication deficits. The theoretical accounts of ASD emphasize concepts such as joint attention and theory of mind, that involves components of cognition, communication and social understanding (NPA, 2001).

Although children with ASD appear to be able to perceive sensory stimuli, their response to such stimuli may be abnormal (Prior & Ozonoff, 1998). For
example, brainstem auditory evoked response hearing testing may demonstrate that the peripheral hearing pathway is intact, although the child’s behavioural response to auditory stimuli is abnormal. Several studies have investigated sensorimotor intelligence in children with autism. The ability to learn material by rote may be less impaired than that involved in the manipulation of more symbolic materials (Losche, 1990; Klin & Shepard, 1994).

Although sensorimotor skills may not appear to be highly deviant in some younger children with autism, aspects of symbolic play and imagination, which typically develop during the pre operational period, are clearly impaired. Children with ASD are less likely to explore objects in unstructured situations (Sigman et al., 1986; Kasari et al., 1993). Younger children with autism do exhibit a range of various play activities, but the play is less symbolic, less developmentally sophisticated, and less varied than that of other children (Sigman & Ungerer, 1984b). These problems may be the earliest manifestations of what later will be seen to be difficulties in organisation and planning (Rogers & Pennington, 1991).

IQ scores have been important in the study of autism and ASD. IQ scores have generally been as stable for children with autism as for children with other disabilities or with typical development (Venter et al., 1992). Tasks that involve spatial understanding, perceptual organisation, and short term memory are often less impaired (Hermelin & O’Connor, 1970; Maltz, 1981) unless they involve more symbolic tasks (Minshew et al. 1992). There may be limitations in abilities to sequence information cross modally, particularly in auditory- visual processing (Frith, 1970, 1972; Hermelin & Frith, 1971).
1.4 Behavioural Assessment for Problem Behaviours

Behavioural assessment for an individual’s problem behaviour seeks to determine the nature of environmental variables that affect the occurrence of the behaviour. Behavioural assessment concentrates especially on why the behaviour is continuing to occur, not on why it might have started occurring originally. Advised by the results of initial assessment, intervention is designed to change the environment so that the behaviour is changed or eliminated. Note that “individual” and “behaviour” are singular nouns. It cannot be assumed that a behaviour (e.g., head banging) is affected by the environment in the same manner.

Assessment is guided by an initial assumption that the challenging behaviour serves a function for the individual. That is, the behaviour continues to occur because (in the past) it has been successful in bringing about an environmental change that acts as a reinforcer for the behaviour. The process of investigating environmental variables to check if they may be reinforcers for problem behaviour is known as functional assessment (Mudford et al., 2008).

Reinforcers can be positive or negative. Positive reinforcers are those which involve the addition of something to the individual’s environment (e.g., attention from the parent following head banging). Negative reinforcers are changes that remove something from the environment (e.g., teacher withdraws a task demand following the same behaviour). Negatively reinforced behaviours are known as escape behaviours if they result in escaping from non preferred situation (the teacher’s demand), or as avoidance behaviours, if they function to avoid the non preferred situation in the first
place, for example, refusing to go into the classroom where demands are likely to be more. Reinforcement can involve environmental changes outside (external) and inside (internal) the body of the individual (Mudford et al., 2008).

Positive and negative internal reinforcers are often called *automatic* reinforcers, since it is assumed that the behaviour automatically produces reinforcement without any involvement of the external social or non-social environment. Automatically reinforced behaviours have been known also as self-stimulatory behaviours, and automatic reinforcers as sensory or perceptual reinforcers (Rapp & Vollmer, 2005). Automatic reinforcers can be positive consequences (i.e., “pleasure”) following a behaviour. Negative reinforcers can be related to the concept of “relief” from internal discomfort, e.g., self scratching reducing an itch, or face pushing to alleviate toothache.

The use of functional assessment with people with ASD and challenging behaviours has grown considerably (Matson & Nebel-Schwalm, 2006). Hanley et al. (2003) found 58 research articles published by 2000 reporting functional analysis that included participants with autism. Interventions for challenging behaviours in people with ASD are more effective if they are designed following functional assessment, particularly functional analysis (Campbell, 2003).
1.5 Behavioural Interventions for Autism

Not even a single intervention has been shown to deal effectively with problem behaviours for all children with autism. However, there is an increasing consensus among developmental, psychological, applied behaviour and legal experts that prevention of such problems should be primary focus, particularly during the early childhood and preschool years (Schroeder et al., 1986; Schopler et al., 1995; Dunlap & Fox, 1999; Berkson & Tupa, 2000). There is also growing consensus that most effective form of prevention of problem behaviours is the provision and implementation of appropriate Individualized Education Plan (IEP) based on proven interventions that have some scientific evidence supporting their value.

The first application of behavioural principles to intervention for autism was reported by Wolf, Risley, & Mees (1964), who worked intensively over a period of 18 months with a 3.5 year old boy with autism and challenging behaviour who also had deficit in communication and other core skills. Results indicated that the operant techniques employed were effective both in reducing challenging behaviour and in establishing appropriate adaptive skills, including verbal behaviour (e.g., use of labelling, pronouns and requests) and self-help skills. The following year, Lovaas and colleagues published research indicating that self destructive behaviour could be socially learnt through processes of operant conditioning (Lovaas, Freitag, Gold, & Kassorla, 1965), and, subsequently, that behavioural techniques could also be used to remediate such behaviours (Lovaas & Simmons, 1969). Research also indicated that negative reinforcement procedures had been effective in establishing social behaviours in two 5-year old identical twins with autism (Lovaas, Schaeffer, &
Simmons, 1965) and that use of shaping procedures had succeeded in teaching imitative speech to two mute children with autism (Lovaas, Berberich, Perloff, & Schaeffer, 1966). Such findings suggested that, contrary to prevailing psychoanalytic interpretations of autism and its associated behaviours, the systematic application of behavioural principles could provide both a coherent conceptual analysis and an effective set of practical techniques for educational intervention in individuals with autism.

Behavioural interventions now include and emphasize strategies for preventing problem behaviours (Koegel, Koegel, & Dunlap, 1996; Carr, Horner, et al., 1999a; Reeve & Carr, 2000). Initial behavioural procedures were reactive in structure. They were based on altering consequences: the events that contingently follow occurrences of problem behaviour. An important development is the increased attention to intervention procedures that occur between bouts of problem behaviour, not just procedures that focus on what to do during (or immediately after) an occurrence of problem behaviour (Carr, Levin, McConnachie, Carlson, Kemp, & Smith, 1994; Carr, Langdon, & Yarbrough, 1999). Strategies for changing the physical characteristics of a setting, altering schedules, modifying curricula, and redesigning social groupings have all been demonstrated to alter the future likelihood of problem behaviours (Dunlap, Kern-Dunlap, Clarke, & Robbins, 1991; Carr, Carlson, Langdon, Magito-McLaughlin, & Yarbrough, 1998). The net result has been a shift from viewing behaviour support as a process by which individuals were changed to fit environments, to one in which environments are changed to match the behavioural needs of people in the environments. It is through environmental
engineering that problem behaviour can be prevented and patterns of problem behaviour altered.

There are many different techniques or ways of assessing the problem behaviour, one of them being functional assessment. Functional assessment is the process of identifying the variables that reliably predict and maintain problem behaviours (Horner & Carr, 1997). The logic for functional assessment comes from a compelling body of research documenting that operant behaviour is affected by (a) the consequences that the behaviour has on the environment, (b) the antecedent events that serve as discriminative stimuli signalling a link between occurrence of a behaviour and a consequence event, and (c) setting events (establishing operations) that alter the momentary value of available consequences (Bijou & Baer, 1961; Bijou, Peterson, & Ault, 1968). The process of conducting a functional assessment typically involves (a) identifying the problem behaviour (or class of behaviours), (b) building hypotheses about the events that reliably occasion and maintain problem behaviour, (c) testing/confirming the hypothesis, and (d) designing an intervention based on the confirmed information (Dunlap et al., 1993; Carr et al., 1994; O’Neill et al., 1997). The initial identification of problem behaviour and hypothesis development often occur through interviews with the people who have the most experience with the problem behaviour, and/or through direct observation. Testing or confirming the hypothesis may occur through additional direct observation or, in some cases, through systematic functional analysis, i.e., direct observation paired with systematic manipulation of environmental events to test validity of the hypothesis (Iwata et al., 1982; Dunlap et al., 1993; Carr, et al., 1994; O’Neill et al., 1997; Repp & Horner, 1999).
Interventions based on functional assessment information have proven more likely to be associated with reduction in problem behaviour (Carr, Horner et al., 1999; Ellingson, Miltenberger, Stricker, Galensky, & Garlinghouse, 2000). In addition, functional assessment is recommended not just at the time an intervention is initiated, but as an ongoing element of effective interventions (O’Neill et al., 1997). Repeated functional assessments may also be needed in cases in which the events that are associated with the initial onset of a specific problem behaviour are different from the events (e.g., consequences) that control the behaviour at a later time (Carr & McDowell, 1980; Guess & Carr, 1991).

Early and Intensive Behavioural Intervention (EIBI) is generally defined as comprehensive applied behaviour analytic programming to target a broad range of skills critical to early childhood development. This approach to intervention with young children with autism is the only intervention to meet the stringent criteria for qualification as a well established and efficacious intervention, according to the American Psychological Association’s evaluation rubric for evaluating the level of empirical support for interventions (Eikeseth, 2009; Eldevik et al., 2009; Reichow & Wolery, 2009). This category requires multiple controlled trials of the intervention compared with various reasonable controls with clear evidence of superiority of the target intervention (Chambliss & Hollon, 1998).

The purpose of EIBI is to increase intellectual (i.e., communication, cognitive, academic) skills and adaptive functioning (i.e., social skills, self care skills, safety) and decrease the ASD symptoms and deficits to prepare children to learn from,
and succeed in, typical home and school environments with fewest possible supports (Green, 1996; Lovaas, 1987; McEachin, Smith & Lovaas, 1993; Lovaas & Smith, 2003). These goals are achieved by creating precise and sophisticated instructional environment for as many of the child’s waking hours as possible, at the youngest age possible, to alter the development trajectory in all areas of functioning. Large and sustained improvements in specific skills and in overall functioning increase the likelihood that a child will continue to be able to succeed throughout life with less intensive behavioural supports (McEachin et al., 1993).

Although various models of EIBI exist, they all share three primary characteristics: (a) intensive treatment delivery (e.g., 30-40 hours per week for 2 years); (b) a hierarchically organised curriculum that focuses on learning readiness, communication, social, and pre-academic repertoires (e.g., Romanczyk, Lochshin, & Matey, 1998; Leaf & McEachin, 1999; Lovaas, 2002); and (c) use of teaching methods based on principles of operant conditioning.

Although Lovaas (1987) was the first to suggest a set of characteristics to define behavioural intervention for autism (i.e., that it should be early, intensive, and comprehensive) the term EIBI has, in recent years, increasingly come to denote the broader range of behavioural techniques and procedures currently used for educational intervention for autism. Although EIBI necessarily includes the UCLA model, it is not confined solely to research carried out at the UCLA, or its affiliated institutions, or to clinicians who work within that framework of application. Green, Brennan, and Fein (2002), for example, have proposed that EIBI should:
1. Be tailored to children’s individual needs, comprehensively addressing all developmental domains.

2. Use a wide range of behavioural procedures (e.g., differential reinforcement, prompting, discrete-trial teaching, incidental teaching, activity-embedded trials, task analysis) to teach adaptive skills and to reduce challenging behaviour.

3. Be directed by one or more individuals with advanced training in ABA and prior experience of intervention with children with autism.

4. Select intervention objectives based upon typical developmental sequences.

5. Actively involve parents as tutors for their children.

6. Initially deliver one-to-one teaching, gradually moving towards small- and large group teaching as appropriate for children involved.

7. Initially provide teaching in the home, gradually generalising teaching contexts to include preschool, kindergarten, and school classrooms.

8. Provide intensive, structured intervention throughout the year, composed of 20 to 30 hrs per week of structured teaching sessions, with additional maximal utilisation of natural learning opportunities.

9. Be carried out for a minimum of two years.

10. Commence when children are between 3 and 4 years of age.

As Myers, Johnson, and American Academy of Paediatrics (2007, p. 1164) have stated, “the effectiveness of ABA-based intervention in ASD has been well documented through 5 decades of research by using single-subject methodology and in controlled studies of comprehensive early intensive behavioural intervention
programs in university and community settings. Children who receive early intensive behavioural treatment have been shown to make substantial, sustained gains in IQ, language, academic performance, and adaptive behaviour as well as some measures of social behaviour, and their outcomes have been significantly better than those children in control groups”. The following segment addresses the principal findings of that growing research literature.

A substantial body of literature is developing on early intervention with ABA (Rogers & Vismara, 2008; Eikeseth, 2009; Granpeesheh et al., 2009c). What has been concluded is that these operant based methods result in marked improvements in core symptoms of disorder. Granpeesheh, Dixon, Tarbox, Kaplan, and Wilke (2009a,b) found that an increase in the treatment hours and a decrease in the child’s age predicted an increase in skills that are learned. Researchers have focussed on starting intensive interventions at an early age. Ospina et al. (2008) reviewed a number of these treatment studies and found that the median age of the children treated was 62 months.

Eventually ABA’s concentration on teaching specific skills and reducing behavioural excesses evolved into comprehensive behavioural treatments for teaching young children with autism the prerequisite skills for learning in general (Olley, 2005). Lovaas (1987) provided the seminal article on implementing these comprehensive behavioural interventions to teach young children with autism (Lovaas, 1983, 2003; Maurice et al., 1996; Maurice, Green, & Foxx, 2001). Although controversial for some, Lovaas (1987) reported that 47 percent of children treated with a comprehensive behavioural approach for teaching fundamental learning skills
did not exhibited autism symptoms and were able to be educated in typical classroom settings. Lovaas’s (1987) results were not fully replicated in the scientific literature. However, prior and subsequent studies examining comprehensive behavioural treatments for people with autism reported significant gains for these people in intellectual skills, communication and adaptive behaviour (Birnbauer & Leach, 1993; Smith et al., 1997; Sheinkopf & Siegel, 1998; Weiss, 1999; Schreck, 2000; Smith, T., Goren, et al., 2000; Eikeseth et al., 2002; Howard, Sparkman et al., 2005; Butter et al., 2006; Cohen et al., 2006).

Rather than viewing challenging behaviour as a symptom of an underlying mental illness, ABA views all behaviour, including unusual and pathological behaviour as the outcome of biological evolution, social evolution and evolution of the operant within the lifespan of the organism (Skinner, 1953). Independent variables in the current environment that can be manipulated, have large effects on the behaviour of interest and are casual (Haynes & O’Brien, 1990). This model has now been applied successfully to the full range of psychopathology (Sturmey, 2007a) including autism (Sturmey & Fitzer, 2007).

Fujiwara et al. (2011) discusses a number of factors that impede early diagnosis of autism, such as, reluctance of some parents to express concerns, failure to provide prompt assessment and diagnosis, and failure of parents or professionals to identify “red flags.” Researchers have found, for example, that paediatricians take 15.5 months (average) to refer for a diagnosis (Shevell, Majnemer, Rosenbaum, & Abrahamowicz, 2001).
Early parent concerns are well documented. Ninety three percent of parents noted concern about their child’s development before 24 months of age (DeGiacomo & Fombonne, 1998). Having said that, ASD is believed to be present at birth (Baghdadli, Picot, Pasca, Pry, & Aussilloux, 2003), and no biological markers exist, behavioural observation and standardised tests that are the only accepted methods of differential diagnosis (Matson, Nebel-Schwalm, & Matson, 2007).

One of the richest methods of obtaining information to assist in early diagnosis is parent observation. Kishore and Basu (2011), for example, reported that in India, mothers had concerns by 2.28 years of age, fully 6 years before a final diagnosis was made. Specific behaviours that the mothers noted were speech regression, loss of motor skills, poor visual tracking, and a lack of joint attention.

1.6 Parental Involvement in treatment of children with ASD

Parents of young children with autism play multiple roles in their children’s life. Often, they are the first people to recognise a developmental problem, and they must pursue their concern until they receive a satisfactory diagnosis and find or develop appropriate services for their child. Once they find a suitable treatment, parents typically are active partners in their child’s education to ensure that skills learned in the educational program transfer to the home settings and to teach their child the many behaviours that are best mastered in the home and the community.

Because of the nature of autism, young children with this disorder need a consistent and supportive environment to make optimal educational progress. For
example, children with ASD often have problems transferring a skill learned in one setting to another place or time. This process of generalisation of learning needs to be anticipated and supported, and so parents of children with ASD need to be more closely involved. For example, early research on the benefits of ABA by Lovaas and his colleagues (1973) showed that children with autism who returned to a home prepared to support their learning maintained their treatment gains better than the children who went to institutional settings that failed to carry over the treatment methods.

Parents can learn techniques for teaching adaptive skills and managing the behaviour of their child with autism. Such intervention maximizes the child’s learning, improves the quality of family life, and may enable parents to sustain their efforts with their child over time. Based on that early observation of the importance of the home environment (Lovaas et al., 1973), several behaviour analysts developed techniques for teaching parents the fundamentals of ABA and making them integral members of the educational team. The research documented that parents could master the basics of ABA, and many became highly skilled teachers (e.g., Harris, 1983; Koegel et al., 1984; Baker, 1989) who expressed satisfaction with the benefits of training (e.g., Harris, 1983; Kolko, 1984). The proponents of ABA have carried the role of parental involvement farther than other approaches, and in some cases it is parents who provide much of the oversight and management of home-based applied behavioural analysis programs, with an outside consultant offering periodic input (e.g., Lovaas, 1987).
Many aspects of the children’s difficulties gradually come to the notice of parents during the first 2 years of the child’s life, undermining their confidence in their ability as parents, as well as causing concern about what the difficulties mean. Children with ASD frequently pose considerable behavioural challenges to their parents and other family members. The children need help to develop early skills in establishing joint attention, imitation of others, communicating interest and meaning as well as immediate wants, understanding the language of others, getting on with and enjoying the company of other people, tolerating change, and so on. This broad agenda has spawned a broad range of approaches to early intervention, with controversial claims for their efficacy (Green 1996a; Harris 1998; Rogers 1998a,b). Some intensive programmes, involving up to 40 hours of structured input to the child every week, have claimed to restore ‘normal functioning’ (Kaufman 1981; McEachin et al. 1993). All comprehensive programmes for young children with ASD (see review by the National Research Council 2001) explicitly involve parents in implementing the strategies, to a greater or lesser extent. Other programmes are based in special education nurseries, with additional training of parents in specific skills (e.g. Ozonoff & Cathcart 1998) and a range of supports offered to families (Prizant et al. 2003). Finally, there are intervention approaches involving parents in behaviour management and promotion of communication skills which are non-intensive, utilizing teaching within everyday situations (e.g. Howlin et al. 1987; Sussman 1999; Shields, 2001).

The involvement of parents in implementing intervention strategies designed to help their children with autism has a history stretching back at least three decades (e.g. Schopler & Reichler, 1971). There is some evidence to suggest that early
intervention for children with ASD is better (Rogers, 1996), which logically implies involvement of parents. Increased parental skills allow for continual opportunities for children’s learning in a range of situations. Training parents as ‘co-therapists’ allows consistent handling, and ensures that intervention is appropriate in enhancing children’s earliest social relationships. The potential benefits of parent training are increased skills, renewed confidence and reduced stress for parents as well as for children. Group training for parents in new skills has been demonstrated to facilitate mutual support (e.g. Baxendale et al. 2001; Symon, 2001). Measurement of the efficacy and effectiveness of the involvement of parents in programmes to help their children’s development should include a range of outcomes: child developmental progress, parent–child interaction patterns, parents’ knowledge, attitudes and stress levels, family functioning, and cost benefit analysis.

Most previous reviews of early intervention in the area of parental involvement in treatment of children with ASD (e.g. Green 1996b; Dawson & Osterling 1997; Connor 1998; Harris 1998; Gresham et al. 1999; Probst 2001) have lacked a systematic approach, minimizing their comprehensiveness and validity. Three other reviews have been more systematic (Smith 1999; Delprato 2001; National Research Council 2001), using a search strategy to locate studies comprehensively and assessing their quality, but they either did not exclude uncontrolled studies or relied mostly on single-case designs. By including studies that lack scientific rigour or generalizability and which contain methodological weaknesses, the reviews have drawn conclusions from evidence which may be confounded. In addition, Smith (1999) used a very narrow basis of outcome comparison, reporting chiefly on children’s intellectual functioning; although a large proportion of children with autism
have delays in intellectual functioning, dependence on intelligence tests as the sole outcome does not allow for the accurate evaluation of different intervention approaches. The most satisfactory scientific review of early intervention in autism was conducted for the New York State Department of Health (1999) in order to develop clinical practice guidelines; however, it did not include a specific focus on the effectiveness of parental involvement in implementing intervention. Diggle et al. (2003) systematically reviewed evidence from randomized controlled trials of parent mediated early intervention, but reported only outcome measures for children.