CHAPTER II

REVIEW OF LITERATURE
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2.0 History of Autism:

Although many modifications have been made to definition of autism, Kanner’s 1943 description of autism endures. In 1943, Leo Kanner provided the first clinical accounts of the current concept of autism when he gave detailed description of 11 children who shared common characteristics. These common characteristics consisted of deficits in language use and acquisition, insistence on sameness, and deficits in social relationships. In 1944 Kanner went on to name this disorder ‘early infantile autism’. Kanner (1943) also discussed the children's insistence on sameness and stereotypic behaviour. These children showed a need for objects to be organised in a specific formations and for routines to be performed in predictable sequences. These autistics children viewed things as complete when objects matched specific formations, and when the environment or actions matched specific routines. A break in the completion of a ritualised sequence of behaviours often caused the children to engage in challenging behaviours. In addition, he noted that these children were engaged in stereotypic behaviour, such as repetitive body movements or repetitive movement of objects.
Kanner (1943) believed that the fundamental characteristic of autism was “extreme autistic aloneness,” shown by the inability to relate to others and situations in typical ways. According to him, from birth, these children had no desire to attend the outside world. These children do not play with others. Attempts by others to interact with the child with autism were ignored or greeted with challenging behaviours as children with autism only interacted with others to acquire something they wanted.

Even though, as early as 1943, Kanner recognised early infantile autism as distinct disorder, it was still diagnosed as childhood psychosis or schizophrenia through the 1970’s. In diagnostic and statistical manual, first edition (DSM-I; APA, 1952) and diagnostic and statistical manual, second edition (DSM-II; APA 1968), childhood schizophrenia was the only official term available to describe children with autism. Even after much research differentiating autism and schizophrenia, (Kolvin, 1971; Rutter & Bartak, 1971), in 1978, the International Classification of Diseases, Ninth edition (ICD-9; WHO, 1977) listed infantile autism under a childhood psychotic category (Volkmar & Klin, 2005). This demonstrates that in the 1970’s many researchers and clinicians believed that infantile autism could be a form of childhood psychosis or schizophrenics. Perhaps Kanner’s use of the word autism in his original description and name for this new disorder (early infantile autism) provided confusion and caused many to believe early infantile autism was a form of schizophrenia (Rutter, 1972; Rutter, 1978; Volkmar & Klin, 2005).

In 1956 Kanner along with Eisenberg (Eisenberg & Kanner, 1956) developed a definition of infantile autism that did not include impairments in language as a core
Only extreme aloneness and insistence on sameness were considered core symptoms. However, Rutter and Bartak (1971) and Rutter (1972) suggested that autism stems from a central disorder of cognition where there are impairments in language comprehension, language use and conceptual thinking. Social and other behavioural abnormalities were viewed as secondary, arising from the central disorder of cognition.

In 1978, Rutter further refined the definition of autism into one of the most influential definitions to date (Matson & Minshawi, 2006; Volkmar & Klin, 2005). He laid down four criteria for autism: (1) Onset before 30 months of age (2) Social impairments (3) impaired language development and (4) insistence on sameness. Insistence on sameness included various stereotyped patterns of play including compulsions, rituals, unusual preoccupation, and resistance to change.

Ritvo and Freeman, in concurrence with the National Society for Autistic Children (NSAC), formulated a competing definition of autism in 1978 (Ritvo & Freeman, 1977; Ritvo & Freeman, 1978; Volkmar & Klin, 2005; Matson & Minshawi, 2006). This definition incorporated impairments in (1) rate of development (2) recreation to sensory stimuli (3) language cognition, non verbal communication and verbal communication (4) ability to relate to objects, people and events, and (5) age of onset before 30 months of age. Similarities between the competing definitions included the age of onset, impairments in communication, and impairments in social interactions.
While developing the Diagnostic and Statistical Manual, Third Edition (DSM-III; APA, 1980), the APA relied on empirical research (Volkmar & Klin, 2005). The DSM-III debuted in 1980 and introduced the new category of Pervasive Developmental Disorders (PDD). This term was developed as an umbrella term for developmental disorders of childhood onset (Volkmar & Klin, 2005), and included infantile autism. Not only were the diagnostic criteria of autism consistent with Rutter’s 1978 definition, but the DSM-III also employed a multi-axial approach to diagnose, and offered specific criteria for each disorder (Volkmar & Klin, 2005; Matson & Minshawi, 2006). In the Diagnostic and Statistical Manual, Third Edition, Revised (DSM-III-R; APA, 1987) the name of infantile autism changed to Autistic Disorder. Additionally, the criteria of autism changed so that a person had to demonstrate 8 out of 16 criteria, with a certain number of endorsements in each of three core areas of impairments (i.e. social, communication and restricted activities and interests; APA, 1987). Early onset was no longer a diagnostic criterion, enabling people who developed autistic like symptoms after 30 months of age to meet criteria for autism. Overall the DSM-III-R widened the diagnostic criteria and led to increase in false positives.

New evidence from empirical research and attempts to form a consensus with International Classification of Disease, Tenth Edition (ICD-10; WHO, 1992) led to refinement of the diagnostic criteria for autism in the Diagnostic and Statistical Manual, Fourth Edition (DSM-IV; APA, 1994). To meet criteria for autism according to DSM-IV, at least 6 criteria must be met, with a certain number of endorsements in three areas of impairment (social, communication and restricted activities and
(interests). Age of onset was re-instated in DSM-IV to 36 months of age (APA, 1994) rather than the previous 30 months of age in DSM-III (APA, 1987).

As stated in DSM-IV-TR (APA, 2000), a diagnosis of Autism requires endorsement of at least six items from the socialization, communication, and restricted, repetitive, and stereotyped interests, activities or behaviour domains. At least two item endorsements must come from the socialization domain, and at least one item endorsement must come from communication domain, and the restricted, repetitive and stereotyped domain. Items in the socialization domain include: (1) impairment in non-verbal behaviours, (2) impairments in the development of peer relationships, (3) deficits in sharing achievements, feelings or interests with others, and (4) impairments on emotional or social reciprocity. Items in the communication domain include: (1) lack of or delay in verbal communication, (2) deficits in initiating or sustaining conversation if the individual has the ability to speak, (3) repetitive and stereotyped language, and (4) deficits in spontaneous make believe play. Items in the restricted repetitive and stereotyped domain include: (1) abnormally high intensity or frequency in regard to preoccupation with a topic, (2) inflexibility in regard to non-functional rituals or routines, (3) repetitive and stereotyped motor movements, and (4) preoccupation with parts of objects. Furthermore, there must be delays or impairments before the age of three in at least one of the following areas: (1) social interaction, (2) communication, or (3) imaginative or symbolic play.

One of the salient feature of autism is its variability – some children speak in complete sentences while others never learn to speak; some children remain aloof while others are affectionate and interested in interacting with others. This great
unpredictability is found in children’s response to intervention—some will show limited progress in therapy and others make quick and significant gains. There are many reported psychiatric symptoms associated with this disorder. These include hyperactivity, poor attention, anxiety, compulsive behaviours, obsessions, compulsions, and sleep problems (Tsai, 1996).

There are generally two patterns of development of symptoms in Autism. The most common course involves the emergence of symptoms in the 1st year of life. In around one-third of the cases, however, there is a regression in skills following a period of fairly typical development. In the pattern where the symptoms appear in first 12 months it is referred to as early onset autism. Symptoms of autism may also appear after a period of fairly typical development, with a regression of acquired skills generally occurring before 24 months of age. This pattern has been estimated to occur in 20% to 47% of cases (Kurita, 1985; Lord, 1995; Davidovitch, Glick, Holtzman, Tirosh, & Safir, 2000; Taylor et al., 2002), with typical age of onset ranging from 16 months (Williams & Ozonoff, 2001) to 24 months (Davidovitch et al., 2000).

2.0.1 Aspergers Disorder: Hans Asperger an Austrian physician first described this disorder in a series of case studies published in 1944 (Asperger, 1944). Although Asperger had no knowledge of Kanner’s 1943 article, he named this disorder Autistic Psychopathology because of observed social impairments these children faced. Through his case studies, Asperger described five shared characteristics that are noticeable from two years of age onward in people with autistic psychopathology: (1) social deficits, (2) non verbal language deficits, (3) lack of humour, (4) stereotypies, and (5) insistence on sameness (Asperger, 1944; Matson & Minshawi, 2006).
With regard to non-verbal language impairments, these children lacked eye gaze, facial expression, gestures, and a typical voice tone. These children also focussed conversation on particular interests and did not understand jokes. Furthermore, these children engaged in stereotyped and repetitive patterns of behaviour, such as body rocking, lining up toys in a particular order, focussing ‘play’ on particular item for long periods of time. The children with autistic psychopathology also showed a preference for a strict adherence to routines.

Although Asperger gave an in-depth description of autistic psychopathology this disorder was not well recognised until Wing wrote about it in 1981 (Frith, 2004; Howlin, 2006; Matson & Boisjoli, 2008). To assuage misunderstanding arising from the term psychopathology Wing (1981) renamed autistic psychopathology, Asperger’s syndrome (AS). Wing (1981) described general characteristics that make up AS: (1) abnormalities in speech, such as abnormal incantation and tone, pedantic, and stereotyped speech (2) deficits in non-verbal communication, such as lack of eye gaze, gestures, and facial expression (3) deficits in social interactions, such as withdrawal from contact with others, lack of play and lack of interaction with the people (4) repetitive activities (5) stereotyped motor movements (6) impairments in motor coordination (7) resistance to change (8) decreased empathy, and (9) circumscribed interests, such as having an abnormal preoccupation with a particular subject.

Currently, clinicians use the Diagnostic and Statistical Manual fourth edition, text revision (DSM-IV-TR; APA, 2000), and the International Classification of Diseases, tenth edition (ICD-10; WHO, 1992) to diagnose mental disorders. As the
DSM-IV-TR is the more commonly used tool to diagnose ASD in the United States, and as the criteria for diagnosing ASD is similar in the DSM-IV-TR and the ICD-10 (Volkmar & Klin 2005).

Early identification of autism is important because early intervention may be more effective for children with autism than for children with other developmental disorders (Barbaresi et al., 2006). Additionally, early identification can provide access to appropriate interventions, which lead to better prognosis (Freeman, 1997). Recent advances in diagnostic techniques have been able to detect differences between typical infants and those with early onset autism at 8-10 months. (Werner et al., 2000).

2.0.2 Prevalence of ASD

Recently, there has been increased interest and a lot of media coverage regarding ASD. This surge in interest can be explained in part by the reported increase in the prevalence of ASD over the last three decades (Rutter, 2005; Schreibman, 2005; Howlin, 2006). Shifting diagnostic criteria definition, widening, changing methodology in studies, improved services for individuals with ASD, and greater awareness of ASD help explain the increased prevalence of ASD (Wing & Potter, 2002). Regardless of the rationale for increases in prevalence, ASD is the second most frequent serious developmental disability in the United States (Nicholas, Charles, Carpenter, King, Jenner & Spratt, 2008), and, except for RTT, occurs in a greater number of males (APA, 2000).
There has been an apparent rise in the rates of autism from past. The current estimated prevalence of ASD is approximately 1:100, which reflects a 15-fold increase from studies published a half-century ago (Zachor, 2012). This rise, in view of some researchers like Fombonne (2005) may be, in part, the result of a broadening definition of autism, particularly at the less severe end of the spectrum; methodological differences in surveys of prevalence, particularly in methods of case findings; and an increasing use of the diagnosis of autism.

Autism affects males 3-4 times higher than females (Fombonne, 1999, 2005; Volkmar et al., 1993; Bryson & Smith, 1998; Yeargin-Allsopp et al., 2003). However, if a female is affected, she will more often fall in the severe intellectual disability range (IQ < 35) and exhibit more severe symptomatology than males with the disorder (Volkmar et al., 1993). Autism affects individuals at all socioeconomic levels (Wing & Gould, 1979; Steffenburg & Gillberg, 1986; Fombonne, 1999, 2003).

Although ASDs occurs at rate of approximately 60 for every 10,000 children (Charman, 2002; Fombonne, 2005; Howlin, 2006; Nicholas et al., 2008), it is not the most frequent serious developmental disability. Intellectual disability (ID) is the most frequent serious developmental disability, occurring at the rate 120 per 10,000 (Nicholas et al., 2008).

In review epidemiological studies of ASD from fourteen countries, Fombonne (2005) indicates that the prevalence of CDD is approximately 2 per 10,000 people. RTT is the least prevalent of the PDDs, with prevalence rates ranging from 1 per 10,000 to 22,000 people (Ghidoni, 2007).
The DSM-IV-TR and other researchers note that PDD has associated features and co morbid diagnosis. Sensory issues and challenging behaviours although not core symptoms of ASD, are associated with ASD (APA, 2000). In regard to co morbidity ASDs are co morbid with ID, epilepsy and a variety of psychopathologies. Up to 75% of people with ASD have a co morbid diagnosis of ID (Matson & Nebel-Schwalm, 2007).

There is also a growing body of evidence to argue that a sizeable percentage of the so-called increase in the incidence of autism in contemporary times may be actually the consequence of changed diagnostic criteria, diagnostic inaccuracies and substitutions, which is simultaneously shrinking numbers of other child psychiatry categories (Venkatesan, 2015; Leonard et al. 2010).

Research shows that symptoms of autism are most often present during infancy and that it can be detected as early as 18 months of age and reliably diagnosed by 20 to 24 months (Baron-Cohen et al., 1996; Rogers, 2001). Many of the parents of children with ASD report concerns about their child’s development since birth, and, by 18 months, most parents raise concerns with their primary health care provider (Siegel, Pilner, Eschler, & Elliot, 1988; Howlin & Asgharian, 1999; Rogers, 2001). Some of the early symptoms of autism include impairments in joint attention, imitation, symbolic play, and responses to emotion (Mundy, Sigman, Ungerer, & Sherman, 1986; Charman & Baron-Cohen, 1997; Charman et al., 1998; Dawson, Meltzoff, Osterling, & Rinaldi, 1998; Dawson, Meltzoff, Osterling, Rinaldi, & Brown, 1998; W.L. Stone, Ousley, & Littleford, 1997; W.L Stone., Lee, E.B., et al.,
Deficits in joint attention and social difficulties are strong predictors of autism in 2 year olds.

2.1 Problem Behaviours in Autism:

Problem behaviours have been included in the description of children diagnosed with ASD since their first descriptions by Kanner in 1943. Problem behaviours are often referred to as challenging behaviours, behaviour problems, aberrant behaviours, maladaptive behaviours, or externalizing behaviours. Although current definitions of problem behaviours may differ slightly, they all include or account for behaviours that are not socially acceptable, can physically harm someone and/or affect education or living placement. Emerson, Robertson and Gregory (2000) define problem behaviours as “culturally abnormal behaviour of such intensity, frequency, or duration that the physical safety of the person or others is placed in serious jeopardy or behaviour which is likely to seriously limit or deny access to the use of ordinary community facilities” (as cited in Mudford, Arnold-Saritepe, Philips, Locke, Ho & Taylor, 2008, p.268).

Problem behaviours are often divided into two groups: extrapersonal and intrapersonal (Sturmey et al., 2008). Extrapersonal problem behaviours include property destruction, verbal threats, tantrum behaviours, aggression towards others, and self-injurious behaviours (SIB). In contrast intrapersonal problem behaviours are less interfering to others. Intrapersonal problem behaviour consists of fearful, anxious, and withdrawn behaviours that hinder learning and social interactions (Sturmey et al.,
Examples are stereotypies and other odd behaviours. Problem behaviours such as SIB, aggressive behaviour, and stereotypy are major impediments to social development and effective education (Horner et al., 2002; Sturmey et al., 2008; Matson & Rivet, 2008).

Research also suggests that Children with autism benefit from intensive, early intervention that focuses on increasing the frequency, form, and function of communicative acts. Available evidence shows that highly structured behavioural methods have important positive consequences for these children, particularly in eliciting first words. However, the limitation of these methods in maintenance and generalization of skills suggests that many children with autism will need to have these methods supplemented with less adult-directed activities to increase communicative initiation and carry over learned skills to new settings and communication partners. Providing opportunities for mediated peer interactions with trained peers in natural settings seems to be especially important in maximizing the effects of this intervention.

As one of the core features ASD is stereotypic behaviour, the majority of the early literature describes types of stereotypic behaviour. Out of the 11 children Kanner (1943) discussed in his original account of autism, about half evinced stereotypies. The children Asperger (1944) described also engaged in problem behaviour other than stereotypies. Some of the children evinced property destruction, physical aggression and verbal aggression.

In the study by Waters, and Healy, (2012) their results showed that the frequency of Self Injurious Behaviours, and co-occurring behaviours all have a
negative impact on social skills. A possible explanation is that problem behaviour becomes a barrier for engaging in meaningful social interaction due to its aversive nature (Matson, Cooper et al., 2008; Matson & LoVullo, 2008; Matson & Rivet, 2008). In the same study the results also demonstrated that when social skills increases, both hostile and inappropriately assertive behaviours decrease. When social skills decrease, inappropriately assertive behaviours increase. The direction of these relationships illustrates the importance of social abilities in regulating appropriate and in appropriate social behaviours. It has been demonstrated that behavioural problems in autism are prevalent with a range from 35.8% to 94.3% (Kozlowski & Matson, 2012) and a large number of studies identifying at least half of the participants with autism engaging in one or more challenging behaviours (Murphy, Healy, & Leader, 2009; Kozlowski & Matson, 2012).

Although problem behaviours, minus stereotypies, are not considered a core features ASD, and not all such children exhibit problem behaviours, numerous studies report that many people with ASD engage in variety of problem behaviours (APA, 2000; Murphy et al., 2005; Lecavalier, 2006; Matson & Nebel-Schwalm, 2007; Matson, 2007; Matson & Dempsey, 2008a; Matson, Wilkins, & Macken, 2009). Matson, Wilkins & Macken (2009) found that 94.3% of 182 children ASD reported some form of problem behaviour. Common problem behaviours displayed by people with ASD include aggressive behaviours, SIBs, and stereotypies (APA, 2000; Matson & Nebel-Schwalm, 2007; Sturmey et al., 2008). Researchers have found that aggression towards others, property destruction, tantrums, verbal disruptions, and stereotypic behaviours are the most common problem behaviours displayed and identified for intervention among these children (Horner et al., 2002; Machalicek, O’
Another common problem behaviour that these children engage in is SIB (Horner et al., 2002; Matson & Nebel-Schwalm, 2007; Schreibman, 2005).

Children with ASD are more likely to evince problem behaviours compared to typically developing children (Gurney, McPheeters, & Davis, 2006, as cited in Mudford et al., 2008), children with psychopathology (Matson, Wilkins, & Macken, 2009), children with learning impairments (Dominick, Davis, Lainhart, Tager-Flusberg & Folstein, 2007), and children with ID alone (Holden & Gitlesen, 2006; Murphy et al., 2005). A recently concluded survey by the United States National Survey of Children’s Health found that 59% of children with ASD had a diagnosis of behavioural and conduct problems (Gurney, McPheeters, & Davis, 2006, as cited in Mudford et al., 2008). This is 10% greater than children without a diagnosis of ASD (Gurney et al., 2006 as cited in Mudford et al., 2008). Holden and Gitlesen (2006) found that children and adults with a co-morbid diagnosis of autism and ID exhibited greater frequencies of problem behaviours than people with ID only.

ASD is also a risk factor for evincing problem behaviours (McClintock, Hall & Oliver, 2003). McClintock and colleagues (2003) conducted a meta-analysis on aggression, SIB, property destruction and stereotyped behaviour in people with ID. They also analysed potential risk factors and found that autism, severe ID, and communication deficits were risk factors for exhibiting problem behaviours. Recent research reports suggest that children with severe ASD are more likely to engage in some forms of problem behaviour (Baghdadli et al., 2003), and are more likely to exhibit a greater number of problem behaviours (Matson, Wilkins, & Macken, 2009). This increased frequency of problem behaviours among people with severe ASD, is
also seen in adults with ASD (Matson & Rivet, 2008). Similar to McClintock & Colleagues’ (2003) findings suggest that ASD symptomotology may predispose people to engage in problem behaviours.

### 2.1.1 Topography of problem behaviours

**Aggressive Behaviour:** Different authors provide different definitions of aggressive behaviours. In addition to physical aggression (Pelios, Morre, Tesch & Axelrod, 1999; Sturmey et al., 2008), some researchers also include property destruction (Pelios et al., 1999; Sturmey et al., 2008), temper tantrums (Sturmey et al., 2008), or a mixture of these in their definition of aggression. Physical aggression includes behaviours that physically harm others, such as, hitting, kicking, biting, and pinching others (Dominick et al., 2007; Gerhardt et al., 2004). Property destruction is defined as behaviours that damage objects (Ando & Yoshimura, 1979). The definition of temper tantrum includes kicking at the floor and screaming (Ando & Yoshimura, 1979; Dominick et al., 2007; Sturmey et al., 2008). Verbal aggression is also assessed as measure of problem behaviour (e.g., Aberrant Behaviour Checklist, Nisonger Child Behavioural Rating Form, Overt Aggression Scale, Autism Spectrum Disorder-Problem Behaviour Adult Version, Autism Spectrum Disorder-Problem Behaviour Child Version).

Matson, Wilkins and Macken (2009) reported that out of 182 children with ASD, 44.3% engaged in verbal aggression, 42.6% displayed property destruction, 40.9% evinced banging on objects with hand, 36.9% engaged in throwing objects at others, 35.8% exhibited kicking objects, and 14.8% displayed pulling others hair. Research suggest that children with autism are more likely to engage in aggressive
problem behaviour than typically developing children (Nicholas et al., 2008), people with ID alone (McClintock et al., 2003), and children with history of language impairment (Dominick et al., 2007). McClintock and colleagues (2003) reported that people with diagnosis of autism are significantly more likely to engage in physical aggression compared with people with ID alone. Concerning temper tantrums, significantly more children with ASD evinced temper tantrums than children with a history of language impairment (Dominick et al., 2007).

Severity of ASD is also related to greater endorsements of certain aggressive behaviours. Matson, Wilkins and Macken (2009) compared severity level of ASD (i.e. mild, moderate and severe) to all items on a measure of problem behaviours. They found that throwing objects at others, banging on objects with hands, and pulling others’ hair was more likely to be endorsed by children who met the cut-off score for severe ASD on a diagnostic measure.

**Stereotypies:** Stereotypies are repetitive behaviours that are rhythmic, topographically invariant and appear to have no purpose (Powell et al., 1999, as cited in Symons, Sperry, Droplk & Bodfish, 2005; Schreibman & Mills, 1983; Sturmey et al., 2008).

**Repetitive behaviours (RB)** are defined as repetitive, non-functional activities or interests that occur frequently and interfere with daily functioning. These include repetitive motor movements, narrow interests, compulsions, and severe behaviour problems like self injury. Dunlap, Dyer, and Koegel (1983) found that
excessive rates of RBs interfere with individual’s ability to learn new skills and engage in daily living activities.

Motor stereotypies include body rocking, hand flapping, object spinning, and walking on toes (Cunningham & Schreibman, 2008; MacDonald et al., 2007, 2013). Fixation on a part of an object and strict adherence to routines are also form of stereotypies. Vocal stereotypies include immediate and delayed echolalia (Cunningham & Schreibman, 2008; Sturmey et al., 2008). These are considered problem behaviour because it interferes with learning, leads to stigmatization from peers, and often leads to decreased interactions in community (Cunningham & Schreibman, 2008).

As stereotyped behaviour is one of the three core features of ASD (APA, 2000) most people with ASD evince stereotypies of some type. In a prevalence study involving 295, 8 year olds from South Carolina with ASD, Nicholas and colleagues (2008) found that 71.9% of males with ASD and 59.2% of females with ASD evince stereotyped mannerisms. In regard to frequency, these children exhibit greater amounts of stereotypies than typically developing children (MacDonald et al., 2007) and children with ID (Bodfish et al., 2000; Matson & Dempsey, 2008b; Matson, Wilkin, & Macken, 2009).

Self Injurious Behaviour: Although definitions of SIB vary slightly, they all include activities where the person inflicts tissue damage on themselves (Rojahn et al., 2008). According to them the behaviour (1) requires intervention, (2) is rhythmic and repetitive, (3) can cause direct physical damage to one’s self or if done over time
can lead to physical harm, and (4) include head banging, hitting body parts, banging other body parts on to objects, self biting, self pinching, self scratching, pulling finger or toe nails, stuffing items into body orifices, self induced vomiting, teeth grinding, pica, drinking excessive amounts of liquids and aerophagia. Eye poking or pressing, and hair pulling are also considered a form of SIB (Berkson, Tupa, & Sherman, 2001; Berkson, 2002; Matson & Lo Vullo, 2008).

In one of the first prevalence studies of problem behaviours among children with autism, Bartak and Rutter (1976) found that 6% engaged in SIB. Recent studies indicate that up to 53% of children with ASD engage in SIB (Baghdadli et al., 2003). In regards to other forms of SIB among children with ASD, 17% engage in mouthing or swallowing objects causing bodily harm (Matson, Wilkins, & Macken, 2009), 12.2% eat inedible items, 11% physically harm themselves (Lecavalier, 2006), 9.6% exhibit eye poking (Matson, Wilkins, & Macken, 2009), 8.5% self scratch or hair pull, and 5.9% self bite (Lecavalier, 2006). Correlated with SIB are greater impairments in daily living skills (Baghdadli et al., 2003), and greater severity of autism (Baghdadli et al., 2003; McClintock et al., 2003; Matson, Wilkins, & Macken, 2009). Matson, Wilkins and Macken (2009) found that children with more severe ASD were significantly more likely to endorse hitting, pinching, scratching self, and mouthing or swallowing objects causing bodily harm than children with mild ASD.

2.2 Factors affecting Problem Behaviours in ASD

Behaviour problems are one of the core features of ASD. Researchers have found that there are many factors that contribute to the onset and maintenance of these
behaviour problems. Some of the factors affecting problem behaviours that seem to have considerable effect on problem behaviours on children with ASD are discussed.

Intellectual level reportedly appears to be correlated with type of repetitive behaviours in individuals with autism. Bartak and Rutter (1976), Gabriels, Cuccaro, Hill, Ivers, and Glodson (2005) found that individuals diagnosed with autism and having lower cognitive ability were more likely to show insistence on sameness than those with average intelligence, whereas those with autism and average intelligence displayed considerably more ritualistic behaviours. Similarly, Poustka and Lisch (1993) found that self injurious behaviours were more frequent and severe for individuals with autism with low intelligence. Turner (1999) found that behaviours, such as, insistence on sameness, unusual attachment to objects, repetitive language, and confined interests are more likely to be observed in higher IQ individuals whereas behaviours like streotypies, manipulation of objects, and self injurious behaviours are more common in low IQ individuals with autism. Similarly Militerni, Bravaccio, Falco, Fico, and Palermo (2002) found that sensory and motor repetitive behaviours in autism were more common in individuals with low intelligence while complex repetitive activities or repetitive speech were more common in individuals with autism having high intelligence.

Researchers have found that as IQ goes down, the severity of ASD and problem behaviours goes up (O’Brien & Pearson, 2004). Another study looked at other potential risk factors for problem behaviours. Age and gender were not related to these behaviours despite the fact that 82% of the sample evinced behaviour problems (Murphy, Healy, & Leader, 2009). The results were replication of study by
Murphy et al. (2009), which found out that severe IQ and ASD were related to higher rates of behaviour problems. Also high rates of stereotypies tended to be related to severity of autism (Goldmon et al., 2009).

Individuals with autism have unique adaptive profiles that reduce social and behavioural effectiveness (Sparrow, Balla, & Cicchetti, 1984; Stone, Ousley, Hepburn, Hogan, & Brown, 1999). For instance, there is a wider gap between cognitive abilities and adaptive skill level in individuals with autism compared to individuals with developmental delay (Volkmar, Carter, Sparrow, & Cicchetti, 1993). Baghdadli, Pascal, Grisi, and Aussilloux (2003) found that in addition to younger age and more severe autism features, lower levels of adaptive skills was also highly associated with self injurious behaviours. Cuccaro et al. (2003) found differential relationships between types of RBs with respect to adaptive skill level. Specifically, repetitive sensory and motor behaviours were negatively correlated with overall adaptive level while insistence on sameness (i.e., difficulties with change) was not. Vig and Jedrysek (1999) found that more severe the person’s intellectual deficits, the greater the likelihood of ASD.

Overall, research suggests there are differences in age trends of problem behaviour for children with developmental disabilities compared to typically developing children. However, research is limited and more is required to evaluate the process of how people with ASDs develop problem behaviours and how this process differs from that of other groups. Schultz and Berkson (1995) found that developmental age was correlated with repetitive motor movements, vocalizations, and handling of objects but was not correlated with preoccupations. Studies like this
suggest that some of the repetitive behaviours in autism may not be specific to autism and are simply a function of level of developmental impairment.

Although the age of onset for physical aggression and temper tantrums vary among children with ASD, Dominick and colleagues (2007) found that these problem behaviours emerge from 0-11 years of age. Most children with ASD begin to engage in physical aggression or tantrum behaviours around 2-3 years of age. Furthermore, 20% of the children with ASD exhibit temper tantrum by 3 years of age.

A review of literature by Berkson and Tupa (2000) conclude that repetitive motor behaviour occurs early in development for typically and atypically developing people. However, among people with developmental disabilities stereotypies continue past the preschool years (Berkson et al., 2001). For toddlers with autism or PDD-NOS, motor stereotypies increased from 7% at 2 years of age to 20% at 4 years of age (MacDonald et al., 2007).

Those diagnosed with ASD typically engage in SIB into adulthood (Bodfish et al., 2000). Therefore this appearance of SIB generally seen in typically developing children does not seem to occur in ASD population. Murphy and colleagues (2005; 2009) and Baghdadi and associates (2003) discuss the effect of age on problem behaviours in the ASD population. Murphy and colleagues (2009) found no significant correlations between age and frequency or severity of aggressive behaviours. Although Murphy and associates (2005) reported that, overall, problem behaviours increased in frequency with age, these problem behaviours were not representative of aggressive behaviours, SIB, or stereotypies. Murphy and colleagues (2005) did not
report the significance levels, perhaps because they were non significant. For example, the percentage of SIB that was considered a marked problem increased from 9.3% to 11.5% after 12 years. For destructive behaviour the percentage increased from 7.6% to 23.2%, for aggression the percentage increased from 7.6% to 16.3%, and for repetitive tapping at objects the percentage increased from 8.1% to 13.8%. However, for tantrum behaviour the percentage decreased from 19.5% to 18.4% after 12 years.

Although problem behaviours are not a core feature of ASD, they interfere with learning (Horner, Carr, Stram, Todd & Reed, 2002; Sturmey, Seiverling & Ward-Horner, 2008; Matson & Rivet, 2008), contribute to physical restraint and medication use, and predict residential care (Harris, 1993; Deb, Thomas, & Bright, 2001; McIntyre, Blacher, & Baker, 2002). Some research indicate that problem behaviours are chronic in the ASD population (Murphy, Beadle-Brown, Wing, Gould, Shah & Holmes, 2005; Murphy, Healy & Leader, 2009), some studies have found that specific problem behaviours decreased with age (Baghdadli, Pascal, Grisi & Aussilloux, 2003).

### 2.3 Assessment of Behaviour Problem in ASD

Despite the fact that problem behaviours among children with ASD are common and debilitating, they have not been well studied (Matson, 2007b, Sturmey, 2007b). As problem behaviours are considered a core symptom of ASD, most diagnostic tools, both Indian and International, do not assess for problem behaviours. In fact, there is some speculation that test developers purposefully excluded problem
behaviours in diagnostic instrument so that problem behaviours would not be viewed as core feature of ASD (Matson & Neble-Schwalm, 2007). However some diagnostic measures of ASD, such as the ADI-R (Autism Diagnostic Interview- Revised), have a few items that assess problem behaviours (Rojahn, Matson, Lott, Esbensen & Smalls, 2001; Matson & Nebel-Schwalm, 2007).

Problem behaviour assessment in children with developmental disabilities is carried out by using several procedures, protocols or techniques, such as, parent interviews, standardized behavioural observations of parent-child interactions, use of checklists, rating scales and other objective parent report data, etc. There are many standardized psychometrically valid and reliable tools to appraise, both, skill/positive as well as negative/problem behaviours in children. Among the listed scales in our country, the ‘Behaviour Assessment Scale for Indian Children with Mental Retardation’ (BASIC-MR, Part B) (Peshawaria & Venkatesan, 1992) and its derivative ‘Behaviour Assessment Scale for Adult Living-Mental Retardation’ (BASAL-MR, Part B) is considered to be popular. Nonetheless, they can be faulted for being archaic, focused on merely children with mental retardation, providing only severity scores (without frequency scores) of problem behaviours, not giving interpretable norms, domain wise or group comparisons, etc. Many of these scales use parent/teacher ratings or estimations of problem behaviours in their children with an acceptable measure of congruence between such respondents (Peshawaria, Venkatesan & Menon, 1988; 1990; Glaser, Kronsoble & Forkner, 1997). However, the utility of such scales is optimized only if they are periodically updated, revalidated, rendered ecologically or culturally valid and made relevant to the special populations for which they are meant for use (APA, 1999). Additionally, in Indian
context, issues involving parent informants or respondents from diverse linguistic and sub-cultural backgrounds, and transgenerational validity become critical rationale, justification and need for periodic reinventing of such existing scales in the country (Venkatesan, 2010).

Some of the current measures designed to assess problem behaviours in people with developmental disabilities, including ASD and ID, are the Aberrant Behaviour Checklist (ABC; Aman, Singh, Stewart & Field, 1985a; Aman, Singh, Stewart & Field, 1985b), Behaviour Problem Inventory-01 (BPI-01; Rojahn et al., 2001), Developmental Behaviour Checklist (DBC; Einfield & Tonge, 1995), Nisonger Child Behaviour Rating Form (CBRF; Aman, Tasse, Rojahn & Hammer, 1996), Overt Aggression Scale (OAS; Hellings, Nickel, Weckbaugh, McCarter, Mosier & Schroeder, 2005), Behavioural Assessment System for Children, Second Edition (BASC-2; Reynolds & Kamphaus, 2004), Autism Spectrum Disorder- Behaviour Problem for adults (ASD-BPA; Matson & Rivet, 2008c), PDD Behaviour Inventory (PDDBI; Cohen, 2003; Cohen, Schmidt- Lackner, Romanczyk & Sudhalter, 2003), and the Autism Spectrum Disorder- Problem Behaviour for Children (ASD-PBC; Matson, Gonzalez & Rivet, 2008).

Problem behaviour assessment protocols/procedures typically involve use of psychometrically valid and standard tools to appraise, both, skill/positive and negative/problem behaviours. Some well known western tools for assessment of problem behaviours are: Walker Problem Behaviour Identification Checklist (Walker, 1983), Aberrant Behaviour Checklist (Aman, Singh, Stewart & Field, 1985a; 1985b), Behaviour Disturbance Scale (Leudar, Fraser & Jeeves, 1987), Eyberg Child
Behaviour Inventory (Boggs, Eyberg & Reynolds, 1990), Behaviour Rating Profile (Brown & Hammill, 1990), Revised Behaviour Problem Checklist (Quay & Peterson, 1993), Checklist of Challenging Behaviour (Harris, Humphreys & Thomson, 1994), Conner’s Rating Scale (Connors, 1997), Child Behaviour Checklist (Achenbach & Rescorla, 2000; 2001), Behaviour Assessment System for Children (Reynolds & Kamphaus, 2004), Burks Behaviour Rating Scale (Burks, 2007), etc. A few examples of problem behaviour assessment scales developed for use in our country are: Behaviour Disorder Checklist (Mishra, 1976), Problem Behaviour Checklist (Arya et al, 1990), Behaviour Assessment Scale for Children with Mental Retardation, Part B (Peshawaria & Venkatesan, 1992a), or its revised version (Venkatesan, 2012), etc. Most of these tools use parent/teacher ratings or estimations of problem behaviours in their children with an acceptable measure of congruence between such respondents (Peshawaria, Venkatesan & Menon, 1988; 1990; Glaser, Kronsnoble & Forkner, 1997).

Despite challenges and issues related to accurate assessment of problem behaviours in children with autism as distinct from deficits in their skill behaviours, it would be worthwhile to explore the ‘what’ or ‘how’ of these questions. Can problem behaviours in children with autism be identified, listed and recorded as distinct from their skill behaviour sets? If so, can such problem behaviours be subjected to any kind of topographical mapping in terms of its antecedents, triggers and consequences? Then, is it possible to undertake a functional behaviour analysis of such behaviours in targeted children? And, when it is attempted, is it possible to undertake a behavioural remediation program at an early stage before such problem behaviours get solidified and cast into the eventual symptomatic presentation of such children? A few previous
studies have indeed attempted to answer these questions using behaviourally oriented interventional strategies (Koegel, Koegel and Surratt, 1992; Rogers, 1996; Horner et al. 2002; Baker & Feinfield, 2003; Campbell, 2003; Cohen, Dickens & Smith, 2006).

2.4 Problem Behaviour Management

Currently, although there is no definite cure for autism, but research suggests that it can be managed with a combination of behavioural, educational, drug and biological interventions (Rimland, 1994b; Gresham, Beebe-Frankenberger, & MacMillan, 1999). The promotion of a child’s social development, language development, and the minimization of behaviours that hamper the social functioning and learning are the main aims of treatment of children with autism (e.g., Prizant, Wetherby, Rubin, & Laurent, 2003; Smith, 1999; Koegel & Koegel, 2006). There are a number of treatment approaches available for individuals with autism. Regardless of the treatment approach, it is important that intervention begin at an early age for the best prognosis. An early start to intervention and individualization of services has been identified in many reports as key to successful interventions (Iovanone, Dunlap, Huber, & Kincaid, 2003).

Variables such as age, cognitive abilities, language and social skills at the time of diagnosis may affect outcome of intervention. Most of the earlier studies focused on children with mean age between 32 and 57 months (review in Rogers, 1998; and in Eaves & Ho, 2004). Children with higher pre- treatment cognitive levels or with better measured social reciprocal abilities advance more in their receptive language than do children with lower pre- treatment cognitive levels and social abilities.
These results are consistent with previous researches which suggested that the cognitive ability in children with autism correlated with outcome of therapy (Volkmar et al., 1989; Waterhouse et al., 1996; Stevens et al., 2000; Volkmar, 2002; Szatmari et al., 2003).

Studies that examined the effect of age found that younger groups achieved better outcomes (Harris & Handleman, 2000). Children who were younger than 48 months when they entered treatment had the most favorable outcome. These results may be because of the fact that plasticity of certain neural systems at this early age permits significant changes in the Central Nervous System with treatment (Dawson et al., 2000). In an early study on early intervention, Fenske, Zalenski, Krantz, and McClannahan (1985) compared outcomes of nine children who entered intensive behavioural intervention before 60 months age to nine children who entered the same treatment program after 60 months of age. Similarly, Harris and Handleman (2000) evaluated age at intake as a predictor of outcome in 27 children with ASDs who attended intensive behavioural intervention programs. They too found that younger age at intake was related to placement in regular education at discharge. The existing evidence would appear to support the notion that individuals with ASDs should enter behavioural intervention as young as possible. However, this will be limited by the degree to which the disorder can be detected at a very young age (Matson, Wilkins, & Gonzalez, 2008; Matson et al., 2009).

Recent studies suggest that substantial gains can be achieved by intensive behavioural intervention initiated prior to 24 months, as neural plasticity is increased and challenging behaviours are less prominent. Effective early intervention should
begin soon after the diagnosis is made, and be individualized, intensive, and comprehensive and should include parent education, and behavioural intervention. It is highly important for pediatricians and experts in child neurology, development and child psychiatry to recognize the early signs of ASD, diagnostic tools and effective intervention methods (Zachor, 2012).

Early social and language inputs are critical for normal brain and behavioural development (Rogers, 1998; Mundy & Neal, 2001). Several studies suggest that early intervention can result in dramatic improvements in some children with autism (Fenske, Zalenski, Krants, & McClannahand, 1985; Lovaas, 1987; Harris, Handleman, Gordon, Christoff, & Fuentes, 1991; Birnbrauer & Leach, 1993; McEachin et al., 1993; G.Dawson & Osterling, 1997; Rogers, 1998; Sheinkopf & Siegel, 1998; Wong, Kwan, 2010). There is also evidence that very early intervention by the age of 2-3 years, results in more positive outcomes than intervention that begins later (Simeonsson, Olley, & Rosenthal, 1987). The National Research Council (2001) recommends at least 25 hours of structured intervention for children with autism, with a strong emphasis on one-on-one intervention.

Many studies have looked for possible predictors of outcome including severity of social deficits (Wing & Gould, 1979; Beglinger & Smith, 2001), neuro-cognitive abilities, mostly using IQ as a measure (Borden & Ollendick, 1994; Waterhouse et al., 1996), and language profile (Tager-Flusberg & Joseph, 2003). The two variables that are consistently identified as early predictors of outcome are IQ and language (Gillberg & Staffenburg, 1987; Tager-Flushberg & Joseph (2003). Several studies have contended that the cognitive level and adaptive behaviour may
be accurate measures for prognosis (Volkmar, Cohen, Bergman, Hooks, & Stevenson, 1989; Waterhouse et al., 1996). Higher IQ measures, especially at older ages, were predictive of better progress (Volkmar, 2002; Szatmari, Bryson, Boyle, Streiner, & Duku, 2003; Rogers, 2008).

The combination of ID and ASD presents many challenges and deficits across a range of behaviours and skills that are not seen in Intellectual Disability or ASD alone (Boucher, Bigham, Mayes, & Muskett, 2008). Schatz and Hamdan-Allen (1995) found that children with autism with higher IQ evinced less improvement in social and daily living skills.

There are several comprehensive treatment programs for autism that show positive outcome. These programs report significant acceleration of developmental rates, significant IQ gains, significant language gains, improved social behaviour, and reduced symptoms of autism after 1 to 2 years in an intensive setting (Roger, 1996). Many studies describe the effectiveness of various interventions aimed at reducing the general level of impairment in autism. Most such studies have concentrated on behavioural approaches, known as ABA (Morris, Maurice, Greene, & Luce, 1996). These approaches were used in home-based programs (Anderson, Avery, DiPietro, Edwards, & Christian, 1987; Lovaas, 1987; Birnbrauer & Leach, 1993; McEachin, Smith, & Lovaas, 1993; Sheinkopf & Siegel, 1998; Eikeseth, Smith, Jahr, & Eldevik, 2002; Howard, Sparkman, Cohen, Green, & Stanislav, 2005) and in centre-based programs (Fenske, Zalenski, Krantz, & McClannahan, 1985; Harris, Handleman, Gordon, Kristoff, & Fuentes, 1991; Dawson, Ashman, & Carver, 2000). Common comprehensive programs used by therapists are the Lovaas method, ABA, Floor
Research suggests that EIBI and Early Start Denver Model can improve language, adaptive behaviour skills and cognitive skills (Eldevik, Hastings et al., 2009; Dawson & Burner, 2011; Warren., McPheeters et al., 2011). Behavioural interventions are effective for improving language, cognitive abilities, adaptive behaviour, and social skills, and reducing anxiety and aggression. Targeted, brief behavioural interventions are efficacious for improving social communication in young children with ASD. Parents can be taught to deliver behavioural interventions, which are associated with improvements in parent-child interaction; effects on child outcome, however, have been mixed. A similar research by Kovshoff., Hastings, and Remington (2011) the findings suggested that EIBI may improve life chances of preschool children with autism. Unfortunately, there are few data indicating whether early gains are maintained after intervention ceases. Results also strongly suggest a need for better characterization of those children who would benefit from more active maintenance programs.

Rimland (1994a) has argued consistently that evidence strongly supports the value of intensive early intervention, and rejects, as a misconception, the belief that Lovaas programmes use aversive stimuli. Rimland concludes that behaviourist methods are more successful than any other form of intervention. Early intervention by diagnostic and early care centers, with the use of mixed models of psycho educational intervention that nevertheless also include an important percentage of
behavioural elements, has proved to be capable of modifying the course of patients with ASD and is currently the most suitable approach.

Eikeseth (undated) also concluded that children who are likely to benefit most from intensive behavioural intervention, modeled on Lovaas principles, are those diagnosed as having mild to moderate autism, and who begin the program before they are 3.5 years old. As per the research a reasonable conclusion is that early intervention is likely to have benefits, even if the extent is not easily predictable. However, it is necessary to adopt a systematic approach based upon ongoing and consistent assessments, individual planning, and consistency of management and expectation among all involved. In a similar study by Ospina Krebs Seida et al (2008), meta-analyses of three controlled clinical trials showed that Lovaas treatment was superior to special education on measures of adaptive behaviour, communication and interaction, comprehensive language, daily living skills, expressive language, overall intellectual functioning and socialization. The study also favored developmental approaches based on initiative interaction compared to contingency interaction in the amount of time spent in stereotyped behaviours and distal social behaviour, but the effect sizes were not clinically significant.

There are several reviews of comprehensive early interventions for children with autism (Gresham et al., 1999; Rogers, 1999, 1996; Corsello, 2005; Campbell, 2007; Heflin & Simpson, 1998; Rogers & Vismara, 2008; Reichow & Wolery, 2009). Many researchers suggest that ABA is the most effective treatment for autism and reviews generally support this claim (Bryson, 1996; Volkmar et al., 2005, 2004; Barbaresi et al., 2006). Rogers and Vismara found that across all studies that they had
reviewed, language, communication, and IQ improved. This indicates that symptoms of autism can be changed in early childhood. Similar to this Corsello (2005) also reviewed several early intervention programs for autism and found that young age, family involvement, and intensive hours are identified as common elements of treatment programs. Most of the treatment outcome studies concentrated on behavioural approaches in home-based programs (Anderson, Avery, DiPietro, Edwards, & Christian, 1987; Lovaas, 1987; Birnbrauer & Leach, 1993; McEachin, Smith, & Lovaas, 1993; Sheinkopf & Siegel, 1998), and in center-based programs (Fenske, Zalenski, Krantz, & McClannahan, 1985; Dawson, Ashman, & Carver, 2000; Harris & Handleman, 2000).

In a study by Zachor et al., (2007) wherein they tried to compare two intervention approaches, Eclectic-Developmental and ABA in very young children. The results showed significant improvements in group receiving ABA treatment than the group receiving Eclectic-Developmental approach. Both groups showed significant improvement in reciprocal social interaction domain. However, the effect size was greater for the ABA group. Many previous studies also reported that early intervention can produce significant behavioural changes (Rogers, 1998; Smith, 1999). Similar studies were carried out by Eikeseth et al. (2002) and Howard et al. (2005) which examined outcome of cognitive, adaptive and language skills. Taking a look at the past and current results, it appears that the ABA approach improves developmental outcome and targets specific deficits in autism more than “eclectic” intervention. A possible explanation for this may lie in the use of structured teaching setting, well defined learning goals and using simple instructions with many repetitions until the goal is achieved.
Iovannone et al. (2003) found that components of successful interventions are:

1. Individualised supports and services for students and families; 
2. Systematic instruction; 
3. Comprehensible and/or structured environments; 
4. Specialised curriculum content; 
5. A functional approach to problem behaviours; and, 

Research by Connor (2007) suggests that the first year focuses on reducing self-stimulatory or aggressive behaviour, developing compliance, and encouraging imitation and play. In second year, the emphasis moves to expressive language, and interactive play. The third year then emphasizes emotional expression, pre-academic tasks, and observational learning.

Many previous studies have emphasized on the effectiveness of intensive therapy based on ABA principles reflected in significant cognitive gains (Harris et al., 1991; Harris & Handleman, 2000; Howard et al., 2005). Itzchak, and Zachor (2008) found that children with autism make remarkable progress in cognitive levels and in several developmental domains like imitation, receptive and expressive language, play, non-verbal communication and reduction of stereotyped behaviours, after a year of intervention. These results are in accordance with previous research which talked about effectiveness of intensive behavioural intervention (McEachin et al., 1993; Rogers, 1998). According to research, the most effective intervention strategies for reducing behaviour problems in children with autism are priming, self-control, training, positive reinforcement and punishment, and presenting preferential activities (Ma, 2009).
Researchers like Carr, Horner et al., (1999), Koegel, Koegal and Dunlap (1996) talked about Positive Behaviour Support (PBS) which is an applied science that uses educational and system change methods (environmental redesign) to enhance the quality of life and minimize problem behaviour. This includes all those skills that increase the likelihood of success and personal satisfaction in normative academic, work, social, recreational, community, and family settings. One of the goals of PBS is to render problem behaviour irrelevant, inefficient, and ineffective by helping an individual achieve his/her goals in a socially acceptable manner, thus reduce or eliminate episodes/instances of problem behaviour (Carr, Dunlap, et al., 2002).

Customized behavioural intervention or Person-centered planning as called in other countries (O’Brien, Mount, & O’Brien, 1991; Smull & Harrison, 1992; Kincaid, 1996) is a process for identifying goals and implementing intervention plans. It is in total contrast to traditional program-centered planning, in which individuals with disabilities are provided with preexisting services that a particular agency has. In customized intervention, the specific needs and goals of the individual drive the creation of new service matrices that are tailored to address the unique characteristics of the individual. As person centered planning seeks to empower individuals with disabilities, it almost invariably leads to a focus on self determination.

Itzchak and Zachor (2008) found that there was a significant progress in six developmental- behavioural domains after 1 year of intervention. They also found that children with higher initial cognitive levels and fewer measured early social interaction deficits showed better acquisition of skills in areas like receptive language,
expressive language and play skills. These findings emphasize the importance of early intensive intervention in autism and the value of pre-intervention cognitive and social interaction levels of predicting outcomes.

2.5 Skill Deficits in Autism

**Impairments in Social Interaction:** Impairments in social interaction are a primary early feature of autism. It has been hypothesised that a lack of normal attention to social stimulus, such as faces, voices, and emotional expressions, deprives the child with Autism of social information input during the first year of life, disrupting normal brain and behavioural development as well as subsequent social development (Mundy & Neal, 2001). Such impairments in social attention, particularly joint attention skills are believed to also impede the development of language (Tomasello & Farrar, 1986; Mundy, Sigman, & Kasari, 1990; Carpenter, Nagell, & Tomasello, 1998; Sigman & Ruskin, 1999; Dawson, Toth, et al., 2004; Bono, Daley, & Sigman, 2003; Rogers & Hepburn, 2003).

One of the first social attention impairment in autism is the lack of normal “Social orienting,” namely, the tendency to spontaneously orient to naturally occurring social stimuli in one’s environment (Dawson, Meltzoff, Osterling, Rinaldi, & Brown, 1998). In typical development, infants devote particular attention to social stimuli, including faces, voices, and other aspects of human beings (Rochat & Striano, 1999). Indeed by 6 months of age, typically developing infants will effectively orient (i.e., turn head and/or eyes) to novel stimuli, particularly social stimuli (e.g., being called by name; Trevarthen, 1979). Children with Autism, however, exhibit early
impairments in social orienting. Home videotape studies of infants later diagnosed with autism (Osterling & Dawson, 1994; Werner et al., 2000; Osterling et al., 2002) revealed social attention impairments, including a failure to look at others and orient to their name in 12 months old, and a failure to orient to name in 8-10 month old infants. In two experimental studies of preschool children with autism and mental age- matched children with developmental delay, children with autism, more frequently failed to orient to both social and non social stimuli, but the impairment was more severe for social stimuli (Dawson, Meltzoff, & Osterling, 1995; .Dawson, Toth, et al., 2004).

**Joint Attention:** These behaviours include sharing attention to an object or event (eg. through the use of alternating eye gaze) following the attention of another (eg., following a gaze or point), and directing attention (eg., showing and pointing to objects/ events). Research has established joint attention ability as core social communication impairment in children with autism, present by 12 months of age and incorporated into the diagnostic criteria for the disorder (Mundy et al., 1986; DSM-IV, American Psychiatric Association, 1994). Additionally, impairments in protodeclarative joint attention behaviours (eg., pointing to show, sharing) seem to be more severe than impairments in protoimperitive joint attention behaviours (eg., pointing to make a request) in children with autism (Mundy et al., 1986, 1990; Sigman, Mundy, Sherman, & Ungerer, 1986). Joint attention ability is predictive of both concurrent language ability and future gains in expressive language skills for children with autism (Mundy, Sigman, Ungerer, & Sherman, 1987; Mundy et al., 1990; Sigman & Ruskin, 1999; Toth et al., 2003). These findings suggests that joint attention ability is a pivotal skill in autism as it appears to lay a foundation for the
development of more complex abilities, such as pretend play, language, and theory of mind (Charman, 1997, 2003; Mundy & Crowson, 1997; Sigman, 1997).

**Face Recognition:** Typically developing infants, at birth, display a visual preference for the sounds, movements, and features of the human face (Goren, Sarty, and Wu, 1975; Maurer & Salapatek, 1976; Morton & Johnson, 1991). Very early in life infants are not only able to recognize their mother’s face (Bushnell, Sai, & Mullin, 1989), but they can also discriminate some facial expression (Nelson, 1993). Children with autism, however, do not show this same preference for and fascination with faces. Osterling and Dawson (1994) found in a study of home videotapes that a failure to look others faces best discriminated 12 month-olds with autism from 12 month-old typically developing infants.

Face matching and face recognition impairments have been found across a number of studies in both children and adults with autism (Ozonoff, Pennington, Tantam, Monaghan, Nicholson, & Stirling, 1989; Rogers, 1990; Boucher & Lewis, 1992; Teunisse & DeGelder, 1994; Boucher, Lewis, & Collis, 1998; Hauck, Fein, Maltby, Waterhouse, & Feinstein, 1998; Jambaque, Mottron, Ponsot, & Chiron, 1998; Cipolotti, Robinson, Blair, & Frith, 1999; Klin et al., 1999).

Many other studies have also shown that individuals with autism process faces differently from controls (Davies, Bishop, Manstead, & Tantam, 1994; Celani, Battacchi, & Arcidiacono, 1999). For example, whereas typically developing individuals tend to focus on the eyes when processing faces, individuals with autism

**Emotion Recognition and Expression:** Children with autism, generally do not exhibit typical pattern of emotional development. A number of studies have shown that children with autism are impaired on tasks requiring recognition, and matching of emotional faces and responding to the emotional displays of others (Sigman, Ungerer, Mundy, & Sherman, 1987; Hobson, Ouston, & Lee, 1989; Sigman, Kasari, Kwon, & Yirmiya, 1992; Bormann-Kischkel, Vilsmeir, & Baude, 1995; Loveland et al., 1997; Dawson, Meltzoff, Osterling, & Rinaldi, 1998; Celani et al., 1999; Dawson, Toth, et al., 2004; ). Baron-Cohen, Spitz, and Cross (1993) reported that children with autism are able to recognise simple emotions, such as happy and sad, which are typically caused by situations, but show greater difficulty than controls in recognising surprise, which is typically caused by beliefs.

**Imitation:** Meltzoff and Moore (1977) demonstrated that newborns are able to imitate facial expressions, which suggests that this is an innate ability. Children with autism, however, show impairments in both immediate and deferred motor imitation (Sigman & Ungerer, 1984a; Stone et al., 1997; Dawson, Meltzoff, Osterling, & Rinaldi, 1998). Of particular importance, imitation skills in children with autism have been shown to predict later social and language learning (Stone et al. 1997; Charman et al., 2000, 2003; Stone & Yoder, 2001). In another study, body imitation was found to predict expressive language ability, whereas, object imitation predicted play skills (Stone et al., 1997). Additionally, it has been theorised that a failure to engage in social imitative play may interfere with the development of joint attention, social
reciprocity, and later theory of mind abilities (Dawson, 1991; Rogers & Pennington, 1991; Meltzoff & Gopnick, 1993).

**Symbolic Play:** In any typically developing child symbolic or representational play emerges between 14 to 22 months of age and includes using an object to represent another object (e.g., a block to represent a car), using absent objects as if they were present (e.g., food that does not exist), or animating object (e.g., pretending that stuffed animals can talk; Leslie, 1987). In children with autism, symbolic play is often absent at 18 month of age (Baron-Cohen et al., 1996) or is delayed relative to mental age-matched developmentally delayed and typical children (Wing & Gould, 1979; Mundy et al., 1987; Charman et al., 1998; G. Dawson, Meltzoff, Osterling, & Rinaldi, 1998). For those children with autism who do acquire symbolic play skills, their level of symbolic play often remains below that of their language abilities (Wing, 1978; Ungerer, 1989; Amato, Barrow, & Domingo, 1999) and is often less diverse and elaborate compared to that of developmentally delayed and typical children (Ungerer & Sigman, 1981). Symbolic play has been associated with both concurrent language and later social ability in young children with autism (Sigman & Ruskin, 1999).

**Language ability:** The acquisition and development of language in autism is often delayed and/ or deviant, with approximately 30% of individuals never acquiring spoken language (Bryson, 1996; Lord & Paul, 1997). In addition to delays in language acquisition persons with autism often exhibit atypical speech patterns, including immediate or delayed echolalia (i.e., verbatim repetition of words or phrases), unusual prosody (e.g., atypical intonation, rhythm, stress, and volume), and pronoun reversal
(e.g., “you want a drink” instead of “I want a drink”), which can persist into adulthood (Kanner, 1943; Cantwell, Baker, Rutter, & Mawhood, 1989; Lee, Hobson, & Chiat, 1994).

Individuals with autism exhibit impairments in both the pragmatic and the semantic aspects of language (Lord & Paul, 1997; Tager-Flusberg, 1993, 1999, 2001; Kjelgaard & Tager-Flusberg, 2001). Pragmatic impairment include difficulty maintaining an appropriate level of detail (e.g., often providing excessive or irrelevant details), speaking in pedantic manner, and difficulties in reciprocity, characterised by a failure to respond to questions and comments initiated by the other person, a tendency to monopolise the conversation (generally associated with perseveration on favourite topics), and difficulties staying on topic (i.e., often inserting random and tangential comments; Eales, 1993; Capps, Kehres, & Sigman, 1998; Tager-Flusberg, 1999, 2001).

2.6 Parental Intervention

Parents of children who have ASD play a very important role; they are the most critical component of the intervention process. Research has suggested that parental and treatment factors are likely to effect children's response to treatment (Van Adel, Geier, Perry, Reitzel, 2011; Strauss, Vicari et al., 2012). The involvement of parents in implementing intervention strategies designed to help their child with autism has a history stretching back at least three decades (e.g., Schopler 1971). The probable benefits are increased skills and reduced stress for parents as well as children. Increased parental skill allow for continual opportunities for learning in a
range of situations. Training parents as ‘therapists’ allows intervention to begin early and ensures that intervention is appropriate in enhancing children’s earliest social relationships (Diggle & McConachie, 2009).

There are a number of studies which evaluate specific parent mediated early intervention approaches in dealing with behaviour problems (e.g., Howlin, 1987; McConachie, Diggle, 2007), in improving parent-child interaction (e.g., Koegel et al., 1996), in facilitating communication (e.g., Prizant et al., 1997), and in implementing a behaviour analytic approach (e.g. Smith et al., 2000). In a study by Jocelyn (1998), it was found that parent-mediated early intervention had a significant impact on child language progress. It is still not very clear as to why the intervention had such a significant positive effect on children’s language. It may be because, with an increased understanding of the children, the parents modulate their behaviour to make communication easier and allow the children to display and practice their linguistic competence.

Bibby and Eikeseth et.al., (2001) studied the progress and outcomes for children with autism receiving parent managed intensive interventions to find that although parent managed programs may bring about gains in language, adaptive, and intellectual functioning, they may not be as large as in centre-based programs, the latter reporting 20 IQ point increases (Harris et al., 1991; Lovaas, 1987; McEachin et al., 1993; Harris & Handleman, 2000) and up to 47% normal functioning (Lovaas, 1987).
Similar to this study was a research by Sheinkopf and Siegel (1998), which evaluated the progress of 9 children receiving 19 hours per week of treatment for 16 months and reported that children’s IQ had risen by a mean of 27 points. Smith, Buch and Gamby (2000) also studied the effect of parent managed programs and reported that although the outcomes were mixed, but two of the children showed increases of > 10 points on standardized measures of intelligence, language, and adaptive behaviour. These reports provide some support for the notion that parent-managed programs may enhance functioning in children with autism.

In another research by Strauss, Vicari et al., (2012) results suggested that parent training and constant parent-mediated treatment provision led to reduced challenging behaviours from the children, increased treatment fidelity and child direct behaviour change as measured by performance in correct responding on behaviour targets. Such results provide important scientific and clinical information on parental and treatment factors likely to affect a child's response to treatment.