Use of Behavioral Therapy for Children with Autism
and the Effects on the Attachment to Primary Caregivers

Ashley A. Tiegen
Adler Graduate School
Dedication

To Bruce, Janet, Brooke, Hailey and Adam;

and to all children with autism and their families
Table of Contents

Abstract ......................................................................................................................... 5
Introduction ..................................................................................................................... 6
Autism ............................................................................................................................. 8
  Differentiating Pervasive Developmental Disorders .................................................. 11
  Pathophysiology ......................................................................................................... 13
  Early Identification ...................................................................................................... 14
Many Types of Autism .................................................................................................. 15
Demographics ................................................................................................................ 15
Prognosis ...................................................................................................................... 17
Stereotypy ...................................................................................................................... 17
Challenging Behaviors ................................................................................................. 18
Effects on Families ....................................................................................................... 19
Treatments .................................................................................................................... 20
  Pivotal Response Therapy ......................................................................................... 20
  Denver Health Sciences ............................................................................................. 21
  TEACCH .................................................................................................................... 22
  LEAP ........................................................................................................................ 23
  Speech & Occupational Therapy .............................................................................. 23
Pharmacologic Treatments ......................................................................................... 24
Biomedical Treatments ............................................................................................... 24
Supplemental Interventions ......................................................................................... 25
Treatment Decisions .................................................................................................... 26
Abstract

Classified within the group of pervasive developmental disorders (PDD) autism is characterized by impaired development in social interaction, communication and behavior. Autism is now considered to be one of three disorders classified together as Autism Spectrum Disorder (ASD) affecting 1 in 110 children in the US. Many studies describe the effectiveness of various interventions, although most studies have concentrated on behavioral approaches such as ABA therapy. It is widely acknowledged that the treatments demonstrating the broadest empirical validation for effectively reducing autistic symptomatology are those based on a behavioral model. This paper explores the relationship between the use of Applied Behavioral Analysis (ABA) techniques in reducing ASD symptomatology and its effects on improving attachment to primary caregivers.
The Use of Behavior Therapy for Children with Autism and the Effects On Attachment to Primary Caregivers

Autism spectrum disorder (ASD) is a neurodevelopmental disorder that results in significant lifelong disability (Rogers, 1998; Tager-Flusber and Joseph, 2003; Wolery and Garfinkle, 2002). Classified within the group of pervasive developmental disorders (PDD) autism is characterized by impaired development in social interaction, communication and behavior (American Psychiatric Association [APA], 2000). Autism has diverse clinical manifestations, behavioral phenotypes, and developmental dimensions, complicating research and clinical practice in regard to diagnosis, etiology, and selecting appropriate intervention (Ben-Itzchak and Zachor, 2006).

Behaviorally defined, autism is a syndrome in which symptoms occur on a continuum, or spectrum, ranging from mild to severe (Gresham, Beebe-Frankenberger, and MacMillan, 1999), diagnosed through clinical observation of developmental milestones (Rice, 2006). Autism is now considered to be one of three disorders classified together as Autism Spectrum Disorder (ASD) affecting 1 in 110 children in the US (Rice, 2006). These conditions on the continuum include Autistic disorder (Autism), Asperger’s Syndrome, and pervasive developmental disorder not otherwise specified (PDD-NOS) (Rice, 2006). Prior to 1980, the term “Autism” was referred to as Autistic Disorder and thought to be rare, affecting approximately one in every 2,000 children (Frombonne, 2009; Rutter, 2005).

Early intervention for autism is increasingly supported by research demonstrating substantial cortical plasticity during early development and positive outcomes from many early educational and behavioral intervention programs (Bertoglio and Hendren, 2009) aimed at
reducing the general level of impairment in autism (Ben-Itzchak and Zachor, 2006). Various early intervention programs utilized in treating autism include Project TEACCH, LEAP Program, Pivotal Response Training, and Applied Behavior Analysis (ABA) among the supplemental treatment modalities as speech and occupational therapy, and pharmacological and biomedical methods.

Many studies describe the effectiveness of various interventions, although most studies have concentrated on behavioral approaches such as ABA therapy (Morris, Maurice, Greene and Luce, 1996). It is widely acknowledged that the treatments demonstrating the broadest empirical validation for effectively reducing autistic symptomatology are those based on a behavioral model (Schreibman, 2000). Since reports of data supporting the use of intensive home-based behavioral intervention for young children with autism published by Lovaas (1987) and McEachin, Smith, and Lovaas (1993) parents have been establishing ‘Lovaas programs’ within their homes for their young children, increasing in number throughout the 90’s (Johnson and Hastings, 2001).

Ainsworth, Blehar, Waters, and Wall (1978) introduction to the study of attachment behavior in infants, creating a standard paradigm, has since seen replications of her work being pursued. Extensions of her work on attachment have included studying children with developmental disabilities. The use of a standard attachment paradigm and rating system in studies of children with biological impairments has been successful (Rogers, Ozonoff, and Maslin, 1993), indicating that children with autism exhibit attachment behaviors similar to their typically developing peers.

Stahlecker and Cohen (1985) demonstrated secure attachment patterns in a group of infants with neurological and motor impairments, as well as Blacher and Meyers’ (1983) study
Behavior Therapy Effects on Attachment 8

of children with Down syndrome during the “strange situation”, revealing progression through stages of standard attachment. Although the progression demonstrated by the infants was slow and displayed less distress at separation, the behavior demonstrated the same range of attachment behavior as typically developing infants.

Autism is often associated with burden and stress for parents (Howlin, Goode, Hutton and Rutter, 2004). The demands placed on parent’s caring for a child with the disorder contribute to a higher overall incidence of parental stress, depression, and anxiety. These demands also adversely affect family functioning and marital relationships, as compared with demands placed on parents of children with other intellectual, developmental, or physical disabilities (Dunn, Burbine, Bowers, and Tantleff-Dunn, 2001; Yim, Moon, Rah and Lee, 1996). The purpose of this paper is to explore the relationship between the use of Applied Behavioral Analysis (ABA) techniques in reducing ASD symptomatology and its effects on improving attachment to primary caregivers.

*Autism*

Kanner (1943) was the first to describe autism as a being characterized by an “extreme autistic aloneness that, whenever possible, disregards, ignores, shuts out anything that comes to the child from outside”. The group of children he reported on was described as showing severe speech and language difficulties, having difficulty in developing normal interpersonal relationships, and becoming easily upset by changes in their environments (Gresham et al., 1999). Later, Rutter (1978) furthered Kanner’s research finding the impairments in autism were distinctive and could not be accounted for solely as resulting from a learning disability, and that the onset of the condition was very early.
Classified in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) as a Pervasive Developmental Disorder (PDD), autism is defined as a behavioral syndrome in which symptoms occur on a continuum, or spectrum, ranging from mild to severe (Gresham et al., 1999). Autism spectrum disorder (ASD) is characterized by severe and pervasive impairment in several areas of development: reciprocal social interaction skills, communication skills, the presence of stereotyped behavior, and interests and activities (APA, 2000).

A bewildering array of deficits in attention, cognition, speech, language, and social functioning, paired with behavioral excesses ranging from noncompliance to explosive aggression and self-injurious behavior are exhibited in ASD (Gresham et al., 1999). Manifestations of the disorder vary greatly depending on the developmental level and chronological age of the individual (APA, 2000) and can be detected at 18 months or younger (Center for Disease Control [CDC], 2010). By the age of 2, diagnosis by an experienced professional can be considered very reliable (Lord, Risi, DiLavore, Shulman, Thurm and Pickles, 2006). The majority (75%) of children with ASD have cognitive deficits, commonly within the IQ range of 35-50, with 100 being the mean score for all ages (Rutgers, Bakermans-Kranenburg, van IJzendoorn and van Berckelaer-Onnes, 2004).

Children with autism may exhibit a failure to cuddle; an indifference to affection or physical contact; a lack of eye contact, facial responsiveness or socially directed smiles; and a failure to respond to their parents’ voices (Rutgers et al., 2004). Difficulty in developing peer relationships and generally having little interest in establishing friendships can be seen in the lack of social and emotional reciprocity (APA, 2000). Although many children with autism express the desire to have friends, they often lack social interaction skills (i.e., eye contact, social
gestures, etc.) and do not have a clear understanding of what friendship involves (Bertoglio and Hendren, 2009).

Impairment in communication is a characteristic of ASD that affects both verbal and nonverbal skills, the former which is exhibited by a delay in development, or total lack of the development of spoken language (APA, 2000). Thirty percent of children with autism experience regression in communication skills, usually before 36 months of age, wherein they frequently lose any previously acquired language (Rogers, 2004). Although many are able to reacquire previous verbal skills, some never develop language (Bertoglio and Hendren, 2009). Individuals with autism who do exhibit adequate speech usually have difficulty in initiating and sustaining conversations outside of their focused interests. Speech can be repetitive and rote, with children echoing phrases from surrounding individuals, movies, video games, books, etc. (Bertoglio and Hendren, 2009), a speech characteristic termed “echolalia”.

ASD is made up of a number of related conditions, most of which are frequently accompanied by at least one challenging behavior (Matson and Minshawi, 2007). At the root of the behavior is encompassing preservation with a stereotyped and restricted interest that is abnormal in the intensity or focus (APA, 2000). McClintock, Hall and Oliver (2003) found that a subgroup of children with autism exhibited self-injury, aggression, and disruptions to the environment when compared to children with other developmental disabilities. These behaviors place the children, and others around them, at risk for physical injury, while limiting involvement in community and educational activities (Sigafoos, Arthur & O’Reilly, 2003).

A lack of “joint attention” is one of the core deficits of autism and its presence is now commonly used for early detection of autism (Naber, Swinkels, Buitelaar, Dietz, van Daalen, Bakermans-Kranenburg, van IJzendoorn & van Engeland, 2007). “Joint attention” is defined as
a relationship between self, other and object (Bakeman and Adamson 1984; Hobson 1993; Leekam, Lopez & Moore, 2000), and indicates the infant’s awareness of the minds of others (Charman, 1997). Therefore, “joint attention” behaviors are considered a major milestone in the development of a child (Bakeman and Adamson, 1984)

In typical development, “joint attention” behaviors emerge prelinguistically, between 6 and 12 months of age (Charman, 2003) and involve interaction with others (Naber et al., 2007). The cluster of behaviors considered as “joint attention” include following gaze, pointing behavior and looking in pointing direction of speaker, mutual gazing, joint visual attention, showing an object, checking, gestures, taking, giving and response to name (Naber et al.).

Social referencing, the process of understanding others through observation and changing one’s behaviors accordingly is also limited in autism (Bertoglio and Hendren, 2009). Lack thereof can reliably distinguish children with early-onset autism from those with other developmental disorders (Baird, Charman and Baron-Cohen, 2000; Palomo, Belinchon and Ozonoff, 2006).

*Differentiating Autism from other PDD*

Pervasive developmental disorders (PDD) are characterized by severe and pervasive impairment in several areas of development: reciprocal social interaction skills, communication skills, and the presence of stereotyped behavior, interests, and activities (APA, 2000). The PDD category includes Asperger’s Syndrome, Rett’s syndrome, childhood disintegrative disorder, and PDD-NOS (APA, 2000). In the DSM-IV, Autistic disorder, Asperger’s Syndrome, and pervasive developmental disorder not otherwise specified (PDD-NOS) are the most commonly diagnosed disorders and perhaps the most difficult to differentiate within the PDD category (Bertoglio and Hendren, 2009).
Asperger’s Syndrome. When the symptoms of autism are present without significant language or cognitive delay, Asperger’s Syndrome is often diagnosed (Bertolgio and Hendren, 2009). Individuals with Asperger’s Syndrome, sometimes called high-functioning autism (HFA), may have preoccupations with certain topics; may have a learning disability in reading, writing, and mathematics, may have an unusually accurate memory for certain information and facts and exhibit peculiar referencing during conversations; and may have hypersensitivity to loud sounds, lights, and odors (Bertoglio and Hendren, 2009). Such extensive overlapping criteria between the disorders have created substantial debate as to whether Asperger’s Syndrome is on the continuum of ASD as an equivalent to HFA (Miller and Ozonoff, 2000).

Rett’s Disorder. Rett’s disorder presents as deceleration of head growth, loss of previously acquired purposeful hand skills and poorly coordinated gait or trunk movements (APA, 2000). Similar to ASD, individuals with Rett’s disorder often experience a loss of social engagement along with severe developmental impairment of expressive and receptive language, and severe psychomotor deficits (APA, 2000).

Childhood Disintegrative Disorder. Childhood disintegrative disorder will begin with healthy development until after two years of age when there is often a significant loss of previously acquired skills in expressive or receptive language, social skills, bowel and bladder control, play and motor skills (APA, 2000). Rett’s syndrome and childhood disintegrative disorder are more easily differentiated from ASD due to the characteristic neurological regression, and are less common with one in children being diagnosed in the U.S. (Bertoglio and Hendren, 2009).

PDD-NOS. A diagnosis of PDD-NOS is often assigned to children who exhibit “atypical autism” who do not meet the full criteria of autistic disorder due to late age of onset, atypical
symptomatology (APA, 2000), subthreshold symptoms, lack of repetitive behaviors, and/or exhibit late development of language (Bertoglio and Hendren, 2009).

Pathophysiology

Autism is thought to involve a complex interaction between multiple and variable susceptibility genes (Keller and Persico, 2003), epigenetic effects (Beaudet, 2002), and environmental factors (London, 2000). Researchers believe that autism results when a genetically susceptible child is exposed to an environmental trigger (Bertoglio and Hendren, 2009). Research into the pathophysiology of autism suggests multiple potential mechanisms supporting the likelihood of different groups of autism (Bertoglio and Hendren, 2009).

The nature of environmental triggers for autism is more controversial. Documented environmental factors associated with autism include prenatal or early postnatal exposure to viral infections, valproic acid (Depakote) or Thalidomide (Thalomid) (Myazaki, Narita and Narita, 2005). Some studies have found high levels of heavy metals, such as mercury, in children with autism. It is unclear as to whether or not they are these are etiologically related to the disorder (Bertoglio and Hendren, 2009).

The role of vaccines as a cause of ASD is heavily debated. Parents of children effected with ASD recall regression recurring immediately after receiving vaccinations. Some studies have shown a higher incidence of autism when exposed to the mercury from Thimerosal-containing vaccines, however, considering the removal of Thimerosal from vaccines (Young, Geier & Geier, 2008). It has been suggested for parents hesitant about vaccinations to spread out the vaccines over a period of several months instead of administering all vaccines at once (Bertoglio and Hendren, 2009).
Pelios and Lund (2001) describe autism as a syndrome rather than a distinct disease for which the neuropsychological causes are unknown. Initial speculation by Bettelheim (1967) that the cause of autism was due in part to cold and emotionally vacant parenting that forced children to withdraw into their own world. Current consensus indicates that autism is a biologically based disorder and a consequence of an organic dysfunction (Minshew, Sweeney and Bauman, 1997).

**Early Identification**

Although periods of developmental delay may be observed in typically developing children, they are often the earliest presenting symptoms in children with autism (Bertoglio and Hendren, 2009). During the first year of life children with autism exhibit a lack of: social smiling (Adrien, Perrot, Sauvage, Leddet, Larmande, Hameury and Barthelemy, 1992), facial expression (Adrien et al., 1992), pointing and showing (Osterling and Dawson, 1994), failure to orient to name (Bernabei, Camaioni, and Levi, 1998) and abnormal muscle tone, posture and movement patterns (Adrien et al.).

Furthermore, indications for an immediate evaluation include no babbling or gesturing by 12 months of age, no single word by 16 months of age, no two-word phrases by 24 months of age, and any loss of language or social skills at any age (Bertoglio and Hendren, 2009). Sensory issues, hyperreactive or hyporeactive, in addition to problems with sleep, feeding, and coordination are also indicators for evaluation (Bertoglio and Hendren, 2009).

Detecting autism at the earliest possible age is of great importance in optimizing positive outcomes for children with the disorder (Dawson, 2008). In 2007, the American Academy of Pediatrics (AAP) published guidelines for the identification and evaluation of children with ASD (Johnson and Myers, 2007). These guidelines suggest “universal developmental surveillance” during the 9-, 18-, and 24-month preventative well-child visits (Johnson and Myers, 2007).
Earlier identification is becoming attainable through combining research in functional and structural brain imaging, immunology, and genetics of autism, with clinical information (Dawson, 2008). The early recognition and diagnosis of ASD in children is essential due to the availability of significant improvement in cognition, peer interactions, and the development of language through referral to an early intervention program (McEachin et al., 1993).

Many Different Types of Autism

The varying severity of symptoms, inconsistent physiologic findings, and response to treatment strongly support the presence of subgroups in ASD (Bertoglio and Hendren, 2009). Many clinicians cluster cases into groups based on commonly associated symptoms: 30% of children with autism exhibit regression (Werner and Dawson, 2005) 30% of children have seizures and mental retardation is found in 70% of children with autism (APA, 2000).

Wing and Gould (1979) presented a subclassification that differentiated children with autism according to particular patterns of social behavior. Three subtypes are identified on the basis of the quality of social interaction: (1) socially aloof children are characterized by indifference to social initiatives made by others; (2) socially passive children show no tendency to interact with others, though they do not actively reject social approaches from others; (3) children that fall within the active-but-odd subtype are characterized by the willingness to make social approaches, but their social interaction can be described as odd and egocentric. Several studies emphasize the role of level of cognitive functioning in differentiating between subtypes.

Demographics

The increase in the prevalence of autism from 1 in 2500 in the 1980’s (Bertoglio and Hendren, 2009) to the current research estimating 1 in 110 children being affected by autism (CDC, 2009) has raised great concern. Controversy exists as to whether the increase in
prevalence is attributed to the emergence of the disorder through an increase in possible causes (i.e., environmental toxins, etc.), or the result of improved diagnostic practices and an increased attention to the disorder leading to sensitive diagnostic measures and more frequent diagnoses (Bertoglio and Hendren, 2009; Granpeesheh, Tarbox and Dixon, 2009).

Autism is reported to occur in all racial, ethnic and socioeconomic groups yet is 4 to 5 times more likely to occur in boys than girls (CDC, 2009). Reasons for this are not fully understood (Bertoglio and Hendren, 2009). Twin studies have shown that among identical twins, if one child has an ASD, then the other will be affected about 60-96% of the time; in non-identical twins, if one child has an ASD, then the other is affected about 0-24 % of the time (Boyle, Van Naarden-Braun and Yeargin-Allsop, 2005). There is also increased risk for subsequent children being affected by autism with a 2%-8% chance of having a second child with the disorder (Boyle et al., 2005).

ASD statistics reporting on the US population have found a higher incidence of autism among immigrants when compared with natives (Bertolgio and Hendren, 2009), with the reasons for the increased occurrence unknown. Additionally, a recent study identified lower rates of autism in Latino populations when compared with non-Latino populations (Bertoglio and Hendren, 2009). Studies in Asia, Europe and North America have identified a prevalence rate of 0.6% to over 1% of individuals with ASD (CDC, 2009).

Studies of prevalence of autism among various socioeconomic populations found lower rates in groups with lower socioeconomic status. However, it is unclear whether this accurately represents a true difference in prevalence or whether it reflects fewer diagnoses being made in underserved populations (Bertoglio and Hendren, 2009). Overall, studies have shown an
increase of ASD diagnoses within the past decade. Pockets of the country with higher SES are having higher rates of autism, i.e., Minneapolis, Seattle.

**Prognosis**

ASD is a neurodevelopmental disorder that results in significant lifelong disability (Rogers, 1998; Tager-Flusberg and Joseph, 2003; Wolery and Garfinkle, 2002) and has diverse clinical manifestations, behavioral phenotypes, and developmental dimensions (Ben-Itzchak and Zachor, 2007). Ben-Itzchak and Zachor (2007) describe the variability of autism as, “some children speak in complete sentences while others may never learn to speak; some children remain aloof while others are affectionate and interested in interacting with others. This variability is also found in children’s response to intervention – some will show limited progress in therapy and others make rapid and remarkable gains”.

Prognosis for children with autism is variable. The disorder generally has lifelong effects on a child’s ability to be social, care for themselves, and to participate in the community (Bertoglio and Hendren, 2009). Autism is a persistent and chronic developmental disorder; only small minority of individuals with autism is capable of living independently at adult age (Buitelaar, 1995).

There is currently no effective means of prevention, no completely effective treatment, and no cure. However, improvements in early diagnosis and a growing body of research on autism are leading to the development of effective treatments and enhanced outcomes for those affected by the disorder (Bertoglio and Hendren, 2009).

**Stereotypy**

Stereotypic behavior is defined as repetitive motor and vocal response that serves no obvious adaptive function (MacDonald, Green, Mansfield, Geckeler, Gardenier, Anderson,
Behavior Therapy Effects on Attachment

Holcomb, and Sanchez, 2007) and is considered a key diagnostic feature of autism (APA, 2000). Stereotypic behaviors have been shown to interfere with acquisition of new skills (Dunlap, Dyer, and Koegel, 1983) and can decrease the likelihood of positive social interactions (Wolery, Kirk, & Gast, 1985). Comparison studies between individuals with autism and those with mental retardation revealed higher levels of stereotypy and intensity in ASD (Bodfish, Crawford, Powell, Golden and Lewis, 2000).

In a comparison study of children with ASD, PDD-NOS and typically developing peers, MacDonald et al. (2007) assessed the levels of stereotypic behavior in 2-, 3-, and 4-year old children. They found a divergence in the duration of stereotypic behavior at the age of 2 years among the three groups. At age 3 children with ASD and PDD-NOS exhibited a longer duration of stereotypic behavior than typically developing children at age 2, and the difference was even more substantial at age 4.

The data presented in the MacDonald et al. (2007) study suggest that the goal of reducing stereotypic behavior in young children with ASD or PDD-NOS has habilitative validity (Hawkins, 1991). The study supports beginning treatment at 2 years, or younger, as the optimal age to reduce the amount of time allocated to stereotypic behavior and develop age-appropriate play and adaptive skills (Berkson and Tupa, 2000).

Challenging Behaviors

A common co-varying group of behaviors with ASD include self-injury, aggression, noncompliance, and stereotypies. These challenging behaviors are problematic in that they can threaten the child’s and others’ safety, can slow the progress of learning and impede access to age appropriate activities (Matson and Nebel-Schwalm, 2005). The complexity of a challenging behavior’s etiology and assessment is not always straightforward (Matson and Nebel-Schwalm),
often presenting with overlapping-integrating and continuum-related factors contributing to the complex reasons that challenging behaviors arise (Barthel, 2009).

Primary challenging behaviors in ASD are aggression, property destruction, protesting, self-injury, and stereotypies (Matson and Minshawi, 2007). Such behaviors are evaluated by using behavioral observations of operationally defined target behaviors and/or functional assessment. The presence, or absence, of such aggressive behaviors is debated as to whether they should be routinely screened for in early intervention (Matson and Minshawi, 2007).

Barthel (2009) describes challenging behaviors as being influenced by “factors gathering inside the nervous system as neurochemistry and are translated into a state of ‘arousal’, or internal energy that underpins the drive to act or react”. Barthel suggests that practitioners observe, identify, and evaluate ‘arousal’ states as possible antecedents behind behavioral interaction.

Effects on Families

Autism often has a devastating impact on the affected child and his or her family members who may experience associated anxiety, stress, mental illness and lost productivity (Bertoglio and Hendren, 2009). Mothers of children with autism are more likely to suffer from depression than mothers of children with intellectual disability (ID) and mothers with typically developing children (Bristol, Gallagher and Holt, 1993).

Parent training has long been regarded as an important component of early intervention programs for children with autism (Harris, 1994). Tonge, Brereton, Kiomall, Mackinnon, King and Rinehart, (2006) found evidence that both parent education and skills training programs and parent education and counseling programs for parents of young children with autism were of
benefit to their mental health and well-being. The results of this study applied particularly to parents with preexisting mental health problems.

*Treatments*

In the area of developmental pediatric practice more controversy exists regarding the choice of treatment for children with ASD than with other developmental disorders (Levy and Hyman, 2005). Many studies describe the effectiveness of various interventions aimed at reducing the general level of impairment in autism (Ben-Itzchak and Zachor, 2006). The promise with early intervention is increasingly supported by studies demonstrating substantial cortical plasticity during early development (Huttonlocher, 1984) and positive outcomes from many early educational and behavioral intervention programs (Lovaas, 1987). Treatments currently used in reducing autistic symptomatology include ABA therapy, Denver Health Sciences Center Program, *TEACCH*, LEAP, Speech/Occupational Therapy, Pharmacological and Biomedical/Supplemental approaches.

*Pivotal Response Training (PRT)*

Pivotal response training provides a structured environment that employs the child’s preferred items and activities to meet the goals of the intervention (e.g., communication, imaginative play) (Sherer and Schreibman, 2005). The components of PRT include (Sherer and Schreibman, 2005): child’s choice, focusing of attention, turn taking (to model appropriate play and language), reinforcement of goal directed attempts, the interspersal of maintenance tasks, and a direct relationship between the response and the reinforcer with reinforcement contingent on appropriate behavior.

Sherer and Schreibman (2005) further describe PRT as a learning interaction beginning when the therapist presents or offers the child choices, and the child directs the training by
choosing and requesting desired items and activities. Each time the child indicates a preference, the therapist requires a response from him or her to gain access to the item (e.g., eye contact, labeling, etc.).

A study provided by Sherer and Schreibman (2005) exploring the efficacy of PRT evidenced improvements on standardized assessments and gains in the areas of language, play, and social skills when participants whose profiles matched the PRT responder profile.

*Denver Health Sciences Program*

Rogers and colleagues (Rogers, 1998) initiated the Denver Health Sciences Center Program (DHSCP) in 1981 at the University of Colorado. The use of play, facilitation of interpersonal relationships, development of language and symbolic thought, and providing structure and routine in the classroom are the core features of the program (Rogers and Lewis, 1998).

The DHSCP is developmentally oriented and utilizes the principles of Piagetian theory. Piagetian theory is based on the idea that developing children build cognitive structures for understanding and responding to the environment. The day treatment program is implemented for 22 hours per week during the course of 12 months (Rogers and Lewis, 1989) and has a teacher/aide-to-child ratio of 2:1 (Gresham et al., 1999).

Several studies on treatment effectiveness of DHSCP showed children made substantial and accelerated developmental gains (Rogers, Herbison, Lewis, Pantone and Reis, 1986; Rogers, Lewis and Reis, 1987; Rogers and Lewis, 1989), suggesting the efficacy of intensive treatment for children with autism (Roger et al., 1991).
**TEACCH**

Project for the treatment and education of autistic and related communication handicapped children (TEACCH) provides comprehensive services, research, and training for autism and other pervasive developmental disorders (Gresham et al., 1999). Founded in 1971 at the University of North Carolina Department of Psychiatry the program utilized parent involvement in the treatment of their child with autism (Gresham et al., 1999).

Collaboration is the cornerstone of TEACCH, which emphasizes the reciprocal sharing of information between the professional and parent with acknowledging the expertise of the professional for skills training and the expertise of the parent about the child’s unique characteristics (Gresham et al., 1999).

Six principles that guide the clinical and research practices of the TEACCH model (Campbell, Schopler, Cueva and Hallin, 1996) include: the goals of intervention are improvement in the individual’s skills and development of environmental adaptations to autism-related deficits; formal and informal evaluations for developing an individual education plan using the Childhood Autism Rating Scale (CARS; Scholpler, Reichler and Renner, 1988) and the Psychoeducational Profile Revised (PEP-R; Mesibov, Scholpler and Shaffer, 1988); cognitive and behavior therapy as top priority as intervention strategies; enhancing skills and accepting deficits in children and their parents; use of visual structures (cues) for optimum education to accommodate and overcome frequent auditory processing deficits relative to strengths in visual processing; and holistic orientation promoting multidisciplinary training and use of consultants. A study conducted by Ozonoff and Cathcart (1998) examined the effectiveness of the TEACCH home-based program showing an average of 9.6 months of developmental gain.
**LEAP**

Learning experiences… an alternative program for preschoolers and parents (LEAP) began in 1982 as a federally funded model demonstration program serving young children with autism, as well as typically developing children between the ages of 3 to 5 years (Gresham et al., 1999). When the LEAP program began it was one of only a few early childhood programs that demonstrated inclusive practices for young children with autism and their families (Kohler, Strain and Shearer, 1996).

Five principles of the LEAP program (Kohler et al., 1996) include: all children can benefit from integrated early childhood environments; benefits of interventions are maximized when conducted across home, school, and community settings; interventions are more effective when parents and professionals work together as partners; young children with autism can learn many important skills (social, language, behaviors) from typical same-age peers; and children with and without disabilities benefit from curricular activities that reflect developmentally appropriate practices (Gresham et al., 1999). There are no controlled outcome studies supporting the efficacy of the LEAP program (Gresham et al., 1999).

**Speech and Occupational Therapy**

Bertoglio and Hendren (2009) describe the benefits of occupational therapy by addressing the child’s unique sensory integration needs and by providing learning skills to obtain sensory input for more effective independent and appropriate self-regulation independently and appropriately. Skills taught by Occupational Therapists help individuals live as independently as possible (i.e., dressing, eating, bathing, etc.) Benefits of speech therapy utilize assistive technologies, such as pictures and computers, to help address the language delay experienced by children affected by autism.
**Pharmacologic Treatments**

Pharmacologic treatments do not target the core symptoms of autism; medications are available to treat symptoms associated with the disorder, which often disturb the lives of those affected and their families (Bertoglio and Hendren, 2009). Aggression, self-injurious behavior and irritability are the only associated symptoms of autism that have a pharmacologic treatment approved by the US Food and Drug Administration using the atypical antipsychotic Risperidone (Bertoglio and Hendren, 2009; Gupta and Rossignol, 2009). Clinical findings also support the use of Risperidone for rigidity and transitions, in addition to cognitive disorganization (Bertoglio and Hendren, 2009).

Repetitive and compulsive behaviors, in addition to cognitive rigidity and anxiety associated with autism are often improved by SSRI’s. ADHD symptoms of distractible inattention, hyperactivity, and impulsivity may be treated with stimulants, including amphetamines and methylphenidate (Bertoglio and Hendren, 2009). Symptoms of mood dysregulation and affective instability may be improved by mood stabilizers, such as divalproex sodium (Bertoglio and Hendren, 2009). A study of 14 patients with ASD’s, including autism, Asperger’s Syndrome, and PDD-NOS, demonstrated improvement in mood instability, impulsivity, and aggression after treatment with divalproex sodium (Hollander, Dolgoff-Kaspar and Cartwright, 2001).

**Biomedical Treatments**

Biomedical treatments, also called complementary and alternative medical (CAM) treatments are commonly used by individuals with autism (Bertoglio and Hendren, 2009) and seek to alter the physiology, or the underlying processes, that result in the symptoms of autism (Levy and Hyman, 2005). A group of physicians, referred to as Defeat Autism Now (DAN)
doctors, have developed systems to treat subgroups of autism effectively by targeting their biological dysfunction (Bertoglio and Hendren, 2009). Such treatments include: hyperbaric oxygen therapy (Rossignol, Rossignol and James, 2007); omega-3 fatty acids (Amminger, Berger and Shafer, 2007) to target an inflammatory process (Bertoglio and Hendren, 2009); methyl B₁₂ (James, Cutler and Melnyk, 2004) nutritional supplements and chelating to alleviate heavy metal toxicity (Levy and Hyman, 2005).

**Supplemental Interventions**

Supplemental interventions include: non-behavior-analytic speech therapies (Prizant, Schuler, Wetherby and Rydell, 1997); Sensorimotor therapies: sensory integration therapy (SIT), stimulating children’s skin and vestibular system through activities such as brushing parts of children’s bodies, squeezing parts of their bodies, swinging on hammocks and spinning in circles on specially constructed chairs (Ayres, 1972); Auditory Integration Therapy (determining sound frequencies to which children may be sensitive and then using headphones to listen to music from which these frequencies have been filtered out; Rimland and Edelson, 1994); and facilitated communication (using an adult facilitator to guide children’s hands as they type on a keyboard; Biklen, 1993).

Individual psychotherapies are also used as a supplemental treatment for ASD. Psychoanalysis is used to provide as much freedom as possible in an atmosphere of warmth and love, so that children can overcome disrupted relationships with parents (Bettelheim, 1967). Greenspan (1992) developed a psychotherapy model, which helps children ‘form a sense of their own personhood’ through playful, emotion-laden interactions with therapists and parents.

Other psychotherapies utilized as supplemental treatments for ASD include Humanistic Play Therapy where children play with toys in a setting of unconditional positive regard.
Behavior Therapy Effects on Attachment

(DesLauriers and Carlson, 1969); Gentle Teaching exhibits unconditional and authentic valuing of children so that bonding occurs between children and parents (McGee and Gonzales, 1990); and Holding Therapy whereby forcibly holding the autistic child so as to cause ‘the autistic defense… to crumble’ (Welch, 1987).

Treatment Decisions

A bewildering array of treatments are available for those affected with ASD (Mandell and Novak, 2005), often leaving parents with conflicting information received from healthcare providers with poor understanding of the symptoms, prognosis and treatment of ASD (Mandell, Zubritsky and Novak, 2004; Mandell, Listerud and Levy, 2002). Mandell and Novak (2005) describe how the context of cultural beliefs and attitudes towards treatments for autism may be affected and influence the extent to which families adhere to treatment strategies.

Etiology and prognosis may also play an important role in families treatment decisions (Mandell and Novak, 2005). If a family believes the cause of autism to be related to heavy metal toxicity, chelation may be the treatment of choice. Thusly, regarding the course of autism, families that believe autism to be a chronic condition, where symptoms can be alleviated though not cured, may make more stable treatment decisions. Mandell and Novak (2005) suggest continued research into the affects of cultural influences in the treatment of autism at which those affected by the disorder are diagnosed early to improve the quality of their care.

Behavior Therapy

Among the many treatments available for autism, applied behavior analysis (ABA) is the best empirically evaluated treatment (Rosenwasser and Axelrod, 2001). As described previously various types of ABA are available. For the purpose of this paper the term ABA will be used for
techniques referred to in autism literature as ‘Lovaas Method’, ‘discrete trial training’ (DTT),
‘operant learning’, and ‘early intensive behavior intervention’ (EIBI).

History

In 1960 ABA interventions for children with autism began with the work of Ivar Lovaas et al. at the University of California, Los Angeles (Rosenwasser and Axelrod, 2001). The use of ABA treatment for young children with autism, known as the UCLA Young Autism Project (YAP), is documented in Lovaas’s (1987) well-known research that took place between 1970 and 1984. Initial results stated that 47% of participants (9 children with autism) obtained “normal” functioning after receiving ABA therapy for 40 hours a week for two years (Grindle, Kovshoff, Hastings and Remington, 2008).

Described in the Lovaas research as “best outcome” was in reference to ABA treatment improving the IQ levels of the children with autism to an “achieved normal intellectual and educational functioning, with normal-range IQ scores and successful first grade performance in public schools” (Lovaas, 1987). In both the 1987 Lovaas report and the 1993 McEachin et al. follow up, 47% of the 19 children in treatment achieved “best outcome” (Shea, 2004).


In 1999, ABA therapy was recognized by the surgeon general of the United States as the treatment of choice for autism (Rosenwasser and Axelrod, 2001). In the mental health report for children it was stated, “Thirty years of research has demonstrated the efficacy of applied
behavioral methods in reducing inappropriate behavior and in increasing communication, learning and appropriate social behavior” (U.S. Department of Health and Human Services, 1999).

Overall, the seminal research conducted by Lovaas et al. (1987) led the way for educating individuals with autism, which previously was seen as impossible (Rossenwasser and Axelrod, 2001). The research demonstrated the importance of language training within the treatment process and showed that to obtain a decrease in autistic symptomatology, or “normal functioning” intervention must begin early and include sufficient duration.

Theory

ABA is the application of behavioral principals of learning and motivation to solve problems of social significance (Granpeesheh, Tarbox and Dixon, 2009). Behavior analysts believe children with autism have various areas of developmental deficit that need to be addressed individually, instead of treating a primary dysfunctional core (Lovaas and Smith, 1989). Autistic symptomatology is deconstructed and organized to define specific behavior or skill domains that behavior analytic intervention targets (Pelios and Lund, 2001).

Basic principles. The principles and procedures of ABA therapy are founded on behavioral principals of learning and motivation, and consist of reinforcement (strengthens desirable consequences), generalization (extends the effects of learning to different environments), extinction (eliminating reinforcement to reduce future probability), and stimulus control (behavior is reinforced in presence of particular antecedent-producing response in the presence of a stimulus) (Granpeesheh et al., 2009). The fundamental principle at the core of ABA is the notion that the consequences of a behavior can either strengthen or weaken it (Granpeesheh et al.).
**Procedures.** The application of behavioral principles (reinforcement, generalization, extinction, and stimulus control) is conducted in 4 teaching procedures: (1) prompting, (2) fading, (3) shaping, and (4) chaining (Granpeesheh et al., 2009). Prompting involves the use of cues (i.e., pointing), or physical assistance (i.e., hand over hand), for a behavior to occur. This assistance is considered temporary and should almost immediately involve fading procedures in order to alleviate prompt dependency from the child. Fading techniques are the gradual fading of prompting cues in order to produce an independent response of desired behavior in its absence. This procedure can be conducted through manipulation of intensity, and immediacy of prompt delivery.

**Teaching formats.** The teaching procedures described in the previous paragraph are implemented in a teaching format of discrete trial training (DTT) and natural environment training (NET) (Granpeesheh et al., 2009). DTT is a highly structured teaching format that uses a series of ‘discrete trials’ to teach each step of a desired behavior or response (CDC, 2010). Every ‘discrete trial’ should have a consequence, or immediate response. The type of response delivered shapes the child’s behavior and signifies a correct or incorrect response. Differential reinforcement is utilized in response to a ‘discrete trial’, therefore a highly reinforcing item is delivered upon a correct response, and least reinforcing items delivered after incorrect response. Differential reinforcement results in greater skill acquisition (Karsten and Carr, 2009)

NET focuses on teaching skills in an environment and format that closely resemble the typical daily activities a young child may encounter. NET is less structured than DTT and is designed to optimalize natural occurring learning. Learning trials begin when the child indicates a desire, by reaching, pointing, or vocalizing a request and is obtained after exhibiting a
prompted response (Granpeesheh et al., 2009). Teaching in a NET format leads to enhanced generalization of acquired skills.

**Scope of intervention.** Granpeesheh et al. (2009) describe ABA programs as being comprehensive in nature and designed to address all areas of autistic symptomatology and deficit. Comprehensive programming involves teaching skills in the areas of gross/fine motor, expressive/receptive language skills, social skills, academic skills, and independent living skills.

Common elements of ABA programming including the following components: (1) intervention is individualized, addressing all skill domains and areas of deficit; (2) ABA procedures are used to build new behavioral repertoires and reduce self-stimulatory behavior; (3) intervention consists of one-to-one interaction with a behavioral therapist with advanced training in ABA therapy, with the child gradually transitioning to small-group and large-group formats; (4) intervention goals are guided by typical developmental sequences (i.e., gross motor development evolves to fine motor development); (5) parents actively participate in their child’s treatment and act as co-therapists; (6) intensive home-based intervention is conducted with up to 40 hours per week (Green, Brennen and Fein, 2002).

**Aspects of ABA**

A substantial amount of research has been conducted on the effects of ABA founded on the principles of ABA showing dramatic improvements in the overall functioning of children with autism (Grindle et al., 2009). In this body of research, Grindle et al. stated there had been little published data on the effects of home-based ABA programming on the functioning of the family unit. This area of research may be an issue of importance, as it takes close family involvement for successful ABA treatment (Green, 1996). Successful ABA programming requires parents and siblings participation in the child’s programming (i.e., social activities, peer
relations, etc.) as well as continuing behavioral procedures after therapy has concluded for the day.

Grindle et al. (2009) conducted research into the impact ABA has on the functioning of the family unit. His research team interviewed families involved in home-based ABA programs and explored the general effect of treatment on family life and also studied issues relating to programming. The research found that, in general, parent’s experiences with ABA was overall positive, benefiting themselves, their child with autism, and the family as a whole.

However, there were challenging aspects involved with conducting home-based ABA programs, such as, obtaining trained therapists, the frequent presence of therapists in the home and lack of privacy, and obtaining teaching materials. Parent’s perception of the impact on siblings was positive overall. Benefits for the siblings included involvement in therapy sessions and the ability to observe therapists interacting with their siblings, and learning more about autism and ABA.

A key finding in the research conducted by Grindle et al. (2009) found that over one third of mothers and fathers were disappointed by the limited progress made by their child, as the obtaining of “normal” functioning was the expectation of treatment outcome. Grindle et al. believes this perception may be in light of the original ABA research conducted by Lovaas (1987) stating 47% of children (nine participants) that received intensive ABA therapy for 2 years, 40 hours a week, obtained “normal” IQ and were successfully mainstreamed into regular schools. However, Shea (2004) makes an argument for “the professional community to acknowledge to families that ABA may be beneficial, for their children with autism, unfortunately there is no evidence of ‘recovery’ or ‘normal functioning’ in 47% of the recipients” (pg. 363).
Importance of Early Intervention

Research on ABA therapy stresses the importance of beginning behavioral treatment for children with autism at a young age, or upon autism diagnosis. This belief is based upon the established premise that the brain exhibits a great amount of plasticity in the first few years of life and that the plasticity gradually diminishes with age (Pelios and Lund, 2001). Brain development is critically dependent on the interaction with environment; therefore, to produce fundamental change in development there is a “window of opportunity” (Pelios and Lund) in early childhood that should be exploited for the child’s gain.

Adlerian Perspective

There are many similarities between Adlerian Psychology and classic learning theory used in ABA therapy. The greatest similarity is the use of reinforcement in ABA therapy and the Adlerian notion of encouragement. Terner and Pew (1978) stated, “In Dreikurs’s system, nothing is more important in child rearing than encouragement. A child cannot develop and acquire a sense of belonging without encouragement. The lack of it is the fundamental cause for misbehavior” (pg. 270).

In ABA therapy an important aspect of the philosophy is to create a situation whereby a child with autism can feel successful, and therefore receive reinforcement (encouragement) for the response given. This is done by taking the end goal and breaking it down to its fundamental pieces. Thereafter, after each piece is taught, thoughtfully chained (sequence of tasks) together and reinforced for the independent response; the child has received many instances of encouragement throughout the teaching process.

Autism is a developmental disorder with an array of deficits expressed specific to each individual. ABA therapy is designed to meet the individual needs of each child specifically for
this reason. Programming is matched to the unique nature of the child and his cognitive schema, as is the reinforcement (encouragement). ABA is delivered with a 1:1 child/therapist ratio; however, the child has a team of multiple therapists. These professionals in turn create a friendly interaction with others, with the child learning through reinforcement (encouragement) to invest socially interest in the therapists.

A diagnostic criterion in autistic symptomatology is the engagement in odd or disruptive behaviors. ABA therapy approaches these behaviors initially through the use of extinction (eliminating reinforcement to reduce future probability), or put in Adlerian terminology this lack of attention would be described as “spitting in one’s soup” with the intent that the mistaken goal of attention would not be achieved.

From an Adlerian perspective, operant systems can be used to encourage socially interested behavior such as empathetic and cooperative skills. Huber and Zivalich (2004) state that from a social learning perspective, the results of a behavioral program are increased feelings of self-efficacy and positive social outcome. The social learning perspective can be put into Adlerian language by saying that inferiority feelings have been replaced by feelings of courage and optimism (Huber and Zivalich, 2004).

Effects on Families

The impact of having a child with autism affects the functioning of the family as a whole. When compared with parents of children with no known disabilities, parents of children with autism have often been found to be more affected by severe psychological problems (Grindle et al., 2009). The demands placed on parents caring for a child with autism contribute to a higher overall incidence of parental stress, depression, and anxiety and adversely affect family
functioning and marital relationships, as compared with the demands on parents of children with other intellectual, developmental, or physical disabilities (Dunn, Dyer and Koegel, 2001).

One study researching the impact of ABA on the family system found that with involvement in an ABA program for over 20 hours per week over 2 years, mothers reported reduced stress levels (Birnbrauer and Leach, 1993). Tonge et al. (2006) found that parents receiving parent education and behavior management skills training (features of communication, principles of managing behavior, managing parental stress, etc.) had improved mental health and well-being. Reducing psychological distress and improving resiliency in parents emerge as part of in the long-term effects of treatment.

**Autism and Attachment**

**Attachment Theory**

In 1978, Ainsworth et al. defined attachment as “the affectional bond, or tie, that an infant forms between himself and his mother figure” and is the framework for development of future relationships. Attachments are established through interaction of reciprocal responsiveness to signals, coordination, and synchrony between infants and caregiving adults (Buitelaar, 1995).

Attachment is characterized by the use of proximity between an infant and the primary caregiver. Behavior that maintains proximity includes active behaviors such as approaching, following, and clinging; and signaling behaviors such as smiling, crying, and calling (Buitelaar, 1995). These behaviors are used as a means of securing protection and care from the primary caregiver and are directed preferentially towards the primary caregiver over other persons (Buitelaar, 1995).
The security provided by an attachment figure is theorized to foster early learning and the development of intelligence (Buitelaar, 1995). A secure attachment allows the infant to pay attention to, approach and explore unfamiliar novel objects which fosters learning and brain development. An attachment relationship consisting of increased or decreased amounts of arousal can cause dysfunction in attention and may affect the establishment of social reciprocity, and communication (Buitelaar, 1995).

*Patterns of Attachment*

Patterns of attachment behavior reflect the child’s anticipations about primary caregiver reactions to their bids for comfort. The caregivers reaction guides the child’s strategies for obtaining comfort and managing stress (Rutgers, Bakermans-Kranenburg, van IJzendoorn and van Berckelaer-Onnes, 2004; Rutgers, van IJzendoorn, Bakermans-Kranenburg, Swinkels, Van Daalen, Dietz, Naber, Buitelaar and Engeland, 2007). These patterns of attachment are activated when the child is tired or distressed, or when there are threats in the environment (Rutgers et al., 2004). Attachment behavior is displayed in these situations as a seeking of proximity, or contact, with the caregiver, and resuming play after having been comforted (Rutgers et al.).

In 1978, Ainsworth et al. (1978) developed the Strange Situation Procedure (SSP) as an assessment for attachment quality in the parent-child relationship. Attachment behavior is observed as the child reacts to confronting a stranger paired with separation from the caregiver. The security of attachment is assessed in the child’s reaction on the reunion with the caregiver (Rutgers et al., 2004).

Classification is rated upon reunion with the caregiver assessing for the display of proximity seeking, contact maintaining, avoidance and resistance (Rutgers et al., 2004). Children in the insecure-avoidant (Type A) classification show little to no response to the
attachment figure’s leaving, and upon reunion they avoid the caregiver, resuming play (i.e., avoidant eye-contact). Type B, secure children, use the attachment figure as a base from which to explore and upon reunion they actively seek interaction (i.e., comforted by contact when distressed). Type C, classifies children as insecure-resistant as a result of the preoccupation with their caregiver throughout the procedure (i.e., they cannot be easily comforted upon reunion and remain distressed throughout the experiment). Lastly, with the disorganized attachment style (Type D) the child displays expressions of fear and apprehension regarding the caregiver, stereotypies, and undirected movement throughout the observation period (Rutgers et al.).

Attachment Assessment

During attachment assessments in children with autism an adapted version of the Ainsworth Strange Situation Procedure (SSP: Ainsworth et al., 1978) has usually been applied (Rutgers et al., 2007b). The SSP generally involves a sequence of two separations and reunions with the caregiver, but is reduced to one separation for children with autism.

The SSP is generally conducted in a laboratory setting, which may be a subject for debate in the case of children with autism (Rutgers et al., 2007b) who are sensitive to sudden changes in the environment commonly found in laboratory-based attachment assessments. It is possible that children with autism are responding more to the unexpected changes in the environment than to the separation from, and reunion with, their caregivers (Rutgers et al).

Waters and Deane (1985) introduced the Attachment Q-Sort (AQS) as an alternative to the SSP. The AQS is based on naturalistic observations of parent-child interactions and can be applied to a broader age range, up to 48 months. The 90 AQS items reflect behavioral descriptions of children in a natural setting, which enhances the ecological validity. A child’s
security score is assessed by the correlation of the observer’s AQS of the specific child and the attachment security criterion sort (Waters and Deane, 1985).

AQS has some advantages over the SSP in that there is higher ecological validity, as the AQS is applied in a natural setting instead of in a laboratory, and includes a broader age range. The AQS is less intrusive than the SSP due to the fact that an unexpected sequence of separations and reunions has been avoided. AQS also provides assessments not only of secure-base behavior but also of sociability, dependency, and other constructs that may be indexed by a subset of the 90 items (Rutgers et al., 2007b).

*Autism and Attachment Theories*

Autism was first classified in the DSM-III (APA, 1980) as a developmental disorder. The disorder was described as a failure to develop normal attachment behavior, which differentiated itself from childhood schizophrenia (Buitelaar, 1995). Dysfunction in attachment was further described as having a “failure to cuddle, lack of eye contact and facial responsiveness, and indifference or aversion to affection and physical contact”. Since autism was classified as a developmental disability research has been conducted to further explore how children with autism exhibit attachment behavior.

Empirical research on the attachment behavior shows that children with autism display attachment behavior to their caregivers when distressed (Buitelaar, 1995). Buitelaar further describes that children with autism discriminate between their parent and stranger by directing a greater degree of social behaviors towards the caregiver than to the stranger. Furthermore, Buitelaar’s (1995) research states “children with autism and children in the control setting tend to react rather similarly to a separation from the parent by increasing proximity seeking behavior on reunion” (pg. 335).
Many children with autism show signs of attachment security despite their impairment in reciprocal social interaction (Rutgers et al., 2004). In a meta-analysis exploring attachment behavior in children with autism, Rutgers et al. found that children with autism demonstrate a clear preference for their mothers over a stranger, while many also show an increase of proximity seeking their mother’s after separation. However, children with autism display less contact seeking and contact maintaining with their mothers than children without autism.

As evidenced in Rutgers et al’s. (2004) meta-analysis children with a greater degree of autistic symptomatology display less securely attached behaviors and show less responsiveness to contact with the caregiver. Rutgers et al. (2004) theorizes that the inability to establish a secure attachment relationship is due to in part to the severity of the impairment in reciprocal social interaction of the child.

Pervasive developmental disorders may alter the behavioral patterns that express attachment security (Rogers, Ozonoff and Maslin-Cole, 1993); although they don’t appear to preclude the development of a secure attachment relationship. Children with autism are able to form secure attachment relationships. However, in the parent-child relationship they tend to display less flexible, sensitive, and “synchronous interactive behaviors” as a result of their social impairments (Rutgers et al., 2007a).

Autistic children’s demonstration of attachment relationships, while expressed in a unique manner, highlights the strong biological disposition of the human child to form emotional attachments, even in the face of major biological and experiential differences, and furthermore, that the formation of attachments has a strong maturational, or developmental component (Rogers et al., 1993).
Greater sensitivity of the mothers was associated with a more securely attached status of the autistic child and contributed directly or indirectly to a higher level of social interaction between mother and child. Despite the genetic and neuropsychiatric impairments, the quality of social and emotional responding by the caregivers may shape the manifestations of the symptomatology (Capps, Sigman and Mundy, 1994).

**Joint Attention and Attachment**

Joint attention is often referred to as the “triadic relation between self, other and object” (Bakeman and Adamson, 1984). Considered a cluster of behaviors (i.e., gaze following, pointing, mutual gazing, etc.), these are the initial behaviors that indicate the infant’s awareness of others’ minds (Charman, 1997). Furthermore, joint attention is a range of behaviors including another person and related to attention (Naber et al., 2007). Children with autism have deficits in joint attention, which is currently used as an early indicator for autism diagnosis (Naber et al.).

Naber et al. (2007) explored the relationship between joint attention and the attachment relationship between child and caregiver. The study found no association between attachment security and joint attention in children with autism; however, the study found that when children without autism had a secure attachment there was a greater display of joint attention than in children with a disorganized attachment relationship. Overall, children with autism displayed fewer joint attention behaviors when compared to children without autism.

The identification of deficits in joint attention at an early age may lead to improvements in autism detection as well as earlier intervention. Improvement in joint attention skills may contribute to the development of language and social skills in children with autism, as joint attention skills are pivotal to socio-emotional and cognitive development (Naber et al., 2007).
Play Behavior and Attachment

Play is important in the development of a child, as it allows him to learn and practice new skills in a safe and supportive environment (Naber, Bakermans-Kranenburg, van IJzendoorn, Swinkels, Buitelaar, Dietz, Daalen, Engeland, 2008). Children’s play illuminates steps of cognitive development reflected in: order, manipulative, functional and symbolic/representational play (Naber et al., 2007). Social aspects of children’s play development starts by the child’s playing by himself to noticing the play of others (Naber et al., 2007). The development of play eventually evolves to the child involving themselves in the play of others and learning cooperation through the “interference” of others into their own play (Naber et al., 2007).

Children with autism display a severe deficit in social behavior which effects play development. The first phase of play development involves exploratory and manipulation of objects (i.e., licking, feeling, sniffing, turning them around, throwing, etc.) (Naber et al., 2007). Often, children with autism will tend to restrict their repertoire of play, become fixated in this initial stage of play, and lack the development of social cooperation of others in their play.

Naber et al. (2007) speculate that the quality of the parent-child attachment may affect the child’s motivational aspects of play behavior. The study by Naber et al. (2007) found that attachment is important in the development of play in children with autism and other developmental disorders. Furthermore, after controlling for developmental level, Naber et al. (2007) found that a secure attachment led to more exploration and higher levels of play (i.e., functional, symbolic) than children with disorganized attachment. This attachment may stimulate
Parental Sensitivity

Basic tenets of attachment theory are the association between parental sensitivity and children’s attachment security (Ainsworth et al., 1978). Individual differences in attachment security have been traced to differences in parenting (Ainsworth et al). Due to the autistic symptomatology limiting social information processing, children with autism may challenge the established role of sensitive parenting obtained in studies of typically developing children (van IJzendoorn, Rutgers, Bakermans-Kranenburg, van Daalen, Dietz, Buitelaar, Swinkels, Naber and Engeland, 2007).

A study measuring parental sensitivity and infant-parent attachment in children with autism at 2 years of age found the sensitivity of parents of children with ASD did not differ significantly from that of parents of children without ASD (van IJzendoorn et al., 2007). An increase in sensitivity was not associated with more attachment security for children with autism, whereas with typically developing children more sensitive parenting was associated with more attachment security (van IJzendoorn et al.).

Frequently documented in research on attachment is the determinant of parental sensitivity (van IJzendoorn et al., 2007), although for children with autism this sensitivity does not appear to be a determining factor in the development of secure or insecure attachment (Rutgers et al., 2004). The assessment of sensitivity and attachment in children with autism may be inadequate for establishing criteria for sensitive parenting. Children with autism may need much more explicit parental stimuli and a stronger emphasis on nonverbal input that children without autism and their parents may thus sometimes appear more physically intrusive (Doussard-Roosevelt, Joe, Bazhenova and Porges, 2003). Proximity seeking would not be dependent on differences in parenting buy on the severity of (inborn) deficits in the social
domain related to autism. Perception of normal parental behaviors may be more threatening for children with autism, who are more easily disoriented by changing environments and who may have more problems reading their parents’ facial expressions of emotions because of mirror neuron dysfunction (van IJzendoorn et al., 2007).

Parenting and Autism

Children with autism are able to form secure attachment relationships, but the relationship between parent and child reflects less flexibility, sensitivity, and synchronous interactive behaviors as a result of the social impairment displayed by children with autism (Rutgers et al., 2007). Parents of children with autism might be more likely to parent with an authoritative style that is characterized by high demandingness and high responsiveness (Baumrind, 1996). The stress endured, as a result of extraordinary parenting demands, may provoke mental health issues (i.e., depression, anxiety, etc.), and a perceived lack of efficacy in the ability to parent (Noh, Dumas, Wolf and Fisman, 1989).

Koegel, Schreibman, Loos, Dirlich-Wilhelm, Dunlap and Robbins (1992) suggested that there is a characteristic stress pattern of parents of children with autism. The profile suggests that concerns about the child’s dependency and about limited family opportunities are the primary contributors to maternal stress. For example, parents report a reluctance to take their child with autism out in public, because of too many frustrations resulting from the child’s behavior. This can lead to isolation of the family.

Noh et al. (1989) suggested that parenting a child with autism is affected particularly by the child’s lack of adaptability (e.g., the inability to adjust to changes in the social environment), acceptability (e.g., parent’s perception of the child as less intelligent), and demandingness (e.g., the frequency and severity of the child’s minor behavioral problems such as crying, disobeying,
seeking and requesting help). The greater intensity of problems generated by children with autism compared to children with Down syndrome may cause reveal higher levels of parenting stress in parents of the children with autism (Noh et al.).

Rutgers et al. (2007) conducted a study investigating the relationship between attachment and parenting. The study found that children with autism rated as least secure compared to the clinical group (children with mental retardation, learning disability) and typically developing children. More specifically, children with autism with coexisting mental retardation were less secure than children with children with mental retardation. This study shows that the autistic disorder affecting attachment security, over the coexisting cognitive deficit.

Further revealed in this study, pertaining to parenting styles, was the use of authoritative parenting (i.e., providing rules and guidance without being overbearing) reportedly used in the non-clinical group more so than by parents with children with autism. Parents of children with autism reported a less authoritative style of parenting. Reporting a higher degree of parental efficacy was associated with a more authoritative parenting style, fewer daily hassles, and fewer psychological problems.

Parents of children with autism perceived themselves as healthy and balanced, reporting a higher degree of social support than parents with children with mental retardation. Although, parents with children with autism display less authoritative parenting style, they still reported parental efficacy to the same degree as parents with children without disability. Rutgers et al. (2007) remark on the resiliency of parents with children with autism due to the stresses that are encountered.
Ainsworth and colleagues (1978) described attachment as the “affectional bond or tie that infants develop with their attachment figure during the first year of life”. Research concerning autism initially had described this population as unable to form attachment relationships considering the core deficits of social interaction and communication (Naber et al., 2007a). However, research on autism and attachment has shown children with autism show signs of attachment security despite their social and communicative deficits (Rutgers et al., 2004). The importance of attachment security is that it affects present and future relationships (Pechous, 2001), along with cognitive functioning. Children with a secure attachment are able to explore their environment and concentrate on learning (Colin, 1996).

Data supporting the use of intensive home-based ABA programming for young children with autism includes initial research conducted by Lovaas (1987) and McEachin et al. (1993). Parents with children with autism have increasingly conducted ABA programs in their homes since the early 90’s (Johnson, 2001). These programs focus on treating autistic deficits as they are expressed in the individual child, considering the range at which children appear on the autism spectrum. More specifically, the child with autism is assigned an individual treatment plan that may incorporate programs such as gross and fine motor body movements, object imitation, language acquisition and manding programs, operant reinforcement of social cues (i.e., eye contact, verbal imitation etc). All programs conducted during behavior therapy require the joint focus of the therapist and child upon the action conducted directed at improving the social and communicative deficits of autism.

An important component of intensive in-home ABA programs is family skill sessions. During family sessions the therapist teaches parents to consistently and predictably respond to
their child’s challenging behaviors, as well as how to generalize the skills taught during therapy. Focus is placed on teaching parents the purpose of the child’s behavior (escape, control, attention, etc.) and how to respond in a sensitive and consistent manner that shapes the child’s behavior to fulfill their needs appropriately (Pechous, 2001).

To date, there has been a considerable amount of research into the effects of early intervention ABA programs on children with autism; however, there has not been much research into the effects of these programs on the attachment security with primary caregivers. However, Pechous (2001) did study the effects of ABA therapy on attachment with fourteen young children with autism and their mothers. The treatment group consisted of families that had been participating in an intensive behavioral program for 4 to 6 months. The assessment tools used for the study were: the Attachment Q-Set (AQS), Maternal Behavior Q-Set (MBQS), Parenting Stress Index/Short Form (PSI/SF), and Vineland Adaptive Behavior Scales. Pechous included treatment effects of behavior programs on attachment security of the child, maternal sensitivity of the mother and parenting stress in the study.

Pechous (2001) found significant evidence of increased secure attachment behaviors in children with autism and increased sensitivity in the mothers when compared to the non-treatment group. More specifically, the research supports the notion that participation in a behavioral program positively affects the primary attachment relationship (i.e., increase in attachment security behaviors in the child and increased maternal sensitivity) by increasing the awareness of and response to social cues exhibited by the child.

Pechous (2001) speculates that the behavioral program component of imitation (i.e., gross/fine motor, verbal, etc.) has an influence on the attachment capacity. Imitation programs teach fine discrimination to increase the child’s awareness of the environment and individual’s in
Behavioral programs influence the ability of the parent to read the child’s behavioral cues and respond in a predictable manner. Consistent responding by the parent creates an opportunity for the child to effectively calm oneself and internalize self-soothing behaviors.

Furthermore, behavioral therapy and the family skills component provided within the program educate parents on issues related to autism (i.e., sensory issues, cognitive delay, challenging behaviors, etc.) and related strategies as a means of decreasing parental stress and increasing perceived parental success (Pechous, 2001).

*Future Research*

The development of evidence based treatments for autism is increasing. The body of research on the positive affects of behavioral therapy as a treatment for children with autism has grown since the seminal research conducted by Lovaas (1987) and McEachin et al. (1993). Studies have concluded the use of behavioral therapy as an early intervention for autism has the positives effects of increasing I.Q scores and adaptive behavior scores (Eldevik, Hastings, Hughes, Jahr, Eikeseth and Cross, 2009; Reichow and Wolery, 2009), and is effective in addressing challenging behaviors common with autism (Granpeesheh et al., 2009).

Acknowledgement of behavioral therapy as the treatment of choice for children with autism reached widespread recognition in 1999 when the surgeon general of the United States stated, ”thirty years of research demonstrated the efficacy of applied behavioral methods in reducing inappropriate behavior and in increasing communication, learning, and appropriate social behavior” (U.S. Department of Health and Human Services).

Empirical research on attachment security and autism has shown that children with autism, despite the deficits of social reciprocity and communication, display attachment behavior to their primary caregiver (Buitelaar, 1995). More specifically, children with autism have the
ability to discriminate between their parents and strangers as evidenced by the directing of social behaviors to the parent, as well as displaying proximity seeking behavior upon reunion with the caregiver after separation (Buitelaar, 1995; Rutgers et al., 2004).

Despite the growing body of research into the positive affects of behavioral interventions for children with autism, including research showing attachment security in children with autism, there is still a need for evidence-based research into the effects of behavioral interventions on attachment security in children with autism.

Beneficial to the evidence based body of research on behavioral treatments for autism is the impact home-based treatments has upon the family system as a whole. Taking into consideration the use of home-based behavioral treatments and the intensive schedule including up to 40 hours a week for treatment, how does this increase/decrease parental stress, and improve family functioning?

Clinical Implications

The culmination of information included in this paper covers a wide array of research into the field of pervasive developmental disorders, more specifically autism. Detailed description of autistic symptomatology and the importance of early intervention were explored. This has clinical importance as the current demographics for autism diagnosis have increased to an estimated 1 in 110 children prevalence rate in 2009 (CDC), from a prevalence rate of 1 in 2500 children in the 1980’s (Bertoglio and Hendren, 2009).

The evidenced-based research in this paper provides awareness of the wide array of treatments used for the treatment of children with autism. More specifically explored are the positive affects of behavioral treatments in reducing autistic symptomatology and the affects these treatments have on attachment to the primary caregiver. This is of clinical importance as it
provides information on two important topics in the field of autism and creates an awareness of a topic that requires further investigation.

Conclusion

Empirical research on the attachment behavior in children with autism shows that there is a display of attachment behavior to their caregiver figure when distressed (Buitelaar, 1995). Children with autism affect the attachment relationship because of deficits in communication, a lack of social reciprocity (Pechous, 2001), and overall developmental and cognitive delay. The attachment relationship whether secure, insecure, anxious/avoidant, or disorganized, involves the interplay between the parent and the child. This relationship is affected by what the parent brings to the relationship (i.e., mental illness, personality disorder, personality characteristics, etc.) and what the child brings to the relationship (i.e., temperament, illness, developmental disability, etc) (Pechous, 2001).

Rogers believes that if we want to help parents increase the responsivity and contingency of their caregiving, we may need to help them to perceive and correctly interpret the subtle, mixed, and/or ambiguous cues some young autistic children provide. Parents may also need to find ways to elicit more cues from a very passive child rather than provide care in the absence of child cues (Rogers et al., 1993).

Behavior therapy positively influences attachment security for children with autism by increasing social behaviors (i.e., eye contact, environmental awareness, etc.), communication, and decreasing challenging behaviors. Increase in the child’s social awareness of others and coaching parents to provide a sensitive and consistent response to the child’s behavioral cues positively affects a secure attachment (Pechous, 2001).
In conclusion, evidenced-based research on the effects of ABA programming for children with Autism shows positive results of decreased symptomatology. The greatest gains from programming have been demonstrated when ABA therapy is provided for 30 to 40 hours per week, for more than 2 years, beginning before the age of 5. ABA programming is comprehensive, and targets all areas of development leading to a greater amount of change in learning and long-term skill acquisition.
Behavior Therapy Effects on Attachment 50

References


National Research Council, Division of Behavioral and Social Sciences and Education,


Rogers, S., Herbison, J., Lewis, H., Pantone, J., & Reis, K. (1986). An approach for enhancing the symbolic, communicative, and interpersonal functioning of young children with


Terner, J. & Pew, W.L. The courage to be imperfect: The life and work of Rudolf Dreikurs.


