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The Autistic Child:
Intervention Strategies

A Thesis for the University Honors Program

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ABSTRACT

With autistic individuals, several intervention strategies have been developed--such as facilitated communication (FC), picture exchange systems, and sensory and auditory integration training--to help them relate to the world around them. Time and technology have indeed brought about many techniques for developing the communication skills of autistic individuals, but the tried-and-true behavior modification therapy (BMT) still proves to be the most effective. If other strategies do work, it is because behavior modification has been incorporated.

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The Autistic Child: Intervention Strategies

We start with an image - a tiny, golden child on hands and knees, circling round and round a spot on the floor in mysterious, self-absorbed delight. She does not look up, though she is smiling and laughing; she does not call our attention to the mysterious object of her pleasure. She does not see us at all. She and the spot are all there is, and though she is eighteen months old, an age for touching, tasting, pointing, pushing, exploring, she is doing none of these. She does not walk, or crawl up stairs, or pull herself to her feet to reach for objects. She doesn't want any objects. Instead, she circles her spot. Or she sits, a long chain in her hand, snaking it up and down, up and down, watching it coil, for twenty minutes, half an hour - until someone comes, moves her or feeds her or gives her another toy, or perhaps a book. (Clairborne-Park, 1982).

Overview of Autism

Autism is not a rare and distant disease, as many of us wish to believe. It affects the adults who cannot live on their own. It affects the child who cannot learn to speak. It affects the parents who try to deal with aggressive behavior and repetitive activity. Autism affects the classroom when teachers and peers do

not know how to deal with children who act as if they are in their own separate worlds. Autism affects the child who is crying inside because no one understands him. It breaks a parent's heart.

Autism is the third most prevalent developmental disability. The most recent data indicates that 4.5 children out of every 10,000 births are diagnosed with autism. It is also estimated that 15 to 20 out of every 10,000 children exhibit autistic-like behaviors (Edelson, 1995). Most research agrees that at least one out of every 1,000 individuals will have autism. Autism is not a disorder that occurs in remote and far-away places. It is affecting children in homes and schools all over the world today.

Leo Kanner of the John Hopkins Children's Psychiatric Clinic published research in 1943 about eleven children with whom he had worked who shared four characteristics: a preference for solitude, a demand for sameness, insistence on routine, and the presence of a remarkable ability in a specific area (Frith, 1993). Kanner took the term autism from adult psychiatry to describe this condition. It had been used to describe a loss of contact with one's environment.

The characteristics cited by Kanner have now been expanded. Today there are a variety of classification systems used to determine if an individual should be labeled autistic. The one most frequently employed is outlined in the Diagnostic and Statistical Manual for Mental Disorders - 4th edition (DSM-IV). Another consists of criteria released by the Individuals with Disabilities Act (IDEA), and a third includes the guidelines

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supplied by individual states. The DSM-IV Criteria for Autistic Disorder are as follows (American Psychiatric Association, 1987):

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

- (1) qualitative impairment in social interaction, as manifested by at least two of the following:
 - (a) marked impairment in the use of multiple nonverbal behaviors such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction
 - (b) failure to develop peer relationships appropriate to developmental level
 - (c) a lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (i.e. by a lack of showing, bringing, or pointing out objects of interest)
- (2) qualitative impairments in communication as manifested by at least one of the following:
 - (a) delay in, or total lack of, the development of spoken language (not accompanied by an attempt to compensate through alternative modes of communication such as gesture or mime)
 - (b) in individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others
 - (c) stereotyped and repetitive use of language or idiosyncratic language
 - (d) lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level
- (3) restricted repetitive and stereotyped patterns of behavior, interests, and activities, as manifested by at least one of the following:
 - (a) encompassing preoccupation with one or more stereotyped and restricted patterns of interest, that are abnormal either in intensity or focus
 - (b) apparently inflexible adherence to specific, nonfunctional routines or rituals
 - (c) stereotyped and repetitive motor mannerisms (e.g. hand or finger flapping or twisting, or complex whole body movements)
 - (d) persistent preoccupation with parts of objects

- B. Delays or abnormal functioning in at least one of the following areas, with onset prior to age 3: (1) social interaction (2) language as used in social communication, or (3) symbolic or imaginative play.
- C. A disturbance that is not better accounted for by Rett's Disorder or Childhood Disintegrative Disorder.

IDEA and Kentucky law agree with DSM-IV in that the core deficits of autism are social interaction and communication behavior patterns. Despite these deficits, some children with autism can perform tasks extremely well if they do not involve social understanding (Frith, 1991). Common characteristics of the child with autism are as follows:

1. Displays indifference
2. Is one-sided in interactions
3. Indicates needs by using an adult's hand
4. Talks incessantly about one topic
5. Parrots words
6. Joins in play only if an adult insists and assists
7. Behaves in bizarre ways
8. Laughs and giggles inappropriately
9. Does not play with other children
10. Handles or spins objects
11. Does not make eye contact
12. Does not pretend in playing
13. Prefers sameness

Pervasive Developmental Disorder is a more recent name for autism in children. "Instead of hearing that their child has classic autism, parents are more likely to hear labels like *Pervasive Developmental Disorder*, *Atypical Pervasive Developmental Disorder*, *Autistic-like*, or *Pervasive Developmental Disorder not Otherwise Specified*" (Powers, 1989). Paula, the Glasgow, Kentucky mother of a son who was recently diagnosed with Pervasive Developmental Disorder, describes her child's characteristics in a recent interview. Paula is only one source and the information she

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has been willing to provide should not be considered statistically valid. She only speaks from her personal experiences with her son. As she explains, "Sam doesn't fit what you think of when you think of 'autistic.' Fortunately, he is high functioning. He can handle change better than others, but he does have his rituals. He has to have four Pringles, no more, no less. He lines them up in a row and eats them one at a time. He also persists on tasks for lengthy periods of time. He could brush his teeth for hours if I'd let him." The characteristics and symptoms of autism have been clearly defined, but the cause of this condition is still under investigation.

Possible Causes of Autism

Kanner suggested in 1943 that autism was of a biological, not psychological, dysfunction. In 1978, it was proven that some aspects of autism are neurological in nature. The size and amount of neurons differ in autistic children when compared with the normal population. The two primary areas in the brain that appear to be affected by autism are the limbic system and the cerebellum, including the cerebellar circuits. The nerve cells of the autistic limbic system are decreased in size but increased in number. Also, the amygdala and hippocampus are areas of this system that are not sufficiently developed in autistic individuals. They are in control of emotions, aggression, sensory mechanisms, and learning ability. There also seems to be a decreased number of Purkinje

cells in the posterior and inferior sections of the cerebellum. The vermal lobules VI or VII of the cerebellum are larger or smaller in autistic individuals than others. These areas control attention (Edelson, 1995).

Another hypothesis for the cause of autism is based on an organic deficiency. "The Reticular formation is the site at which sensory input, represented as highly complete electrical patterns, is integrated and converted to a code. Without such code, memory is impossible. An impaired reticular formation could result in autistic characteristics" (Joseph, 1993). Only a very small number of brain cells are used and therefore only a few responses are exhibited by the individual. This may be part of what is known as the "closed loop phenomena." This occurs when autistic children can't comprehend new stimuli and are unable to integrate it into anything that has been previously learned (Joseph, 1993). Memories, thoughts, and ideas may be stored in a segregated manner within the brain.

Autism may also be caused by differences in biochemistry. Many individuals with the disease have significantly high or low amounts of serotonin in their blood and spinal fluid. An increase in beta-endorphins also elevates the level of pain tolerance.

Other evidence suggests that viruses can lead to autism. A mother who is exposed to rubella or cytomegalo has a greater likelihood of giving birth to a baby with autism. Others believe there is a genetic link to autism. One study shows that out of eleven families with autistic fathers, twenty-five of the forty-

four children were also diagnosed with the impairment. Allergies are another condition that has been connected with autism. "Certain foods, such as cow's milk, dairy items, wheat, sugar, chocolate, eggs, chicken, and fruits have been known to cause problems in the brain that result in autistic-like behaviors. These include hyperactivity, aggression, and sound sensitivity" (Edelson, 1995). There is even concern now that toxins in the environment can promote autism. Of the many possibilities, no one unique cause has been identified. It could be a combination of any of the mentioned hypotheses. The most commonly accepted idea is that autism is caused by a neurological problem in one or more areas of the brain, but since the specifics are unknown, no correctional procedure has been developed.

Intervention Strategies

"Although the cause is unknown, professionals can treat the symptoms related to autism to give the individual a greater quality of life" (Frith, 1993). Several intervention strategies--such as facilitated communication (FC), picture exchange systems, and sensory and auditory integration training-- have been developed to teach autistic individuals skills to help them relate to the world around them. Time and technology have indeed brought about many new techniques for developing the communication skills of autistic individuals, but the tried-and-true behavior modification therapy (BMT) still proves to be the most effective. If other strategies

do work, it is because behavior modification has been incorporated.

Behavior Modification Therapy

"The consensus among scientists is that so far behavioral techniques are the only methods that have shown any success with changing for the better the behaviors of individuals with autism" (Dillion, 1993). Among children who begin BMT before the age of four, 47% recover from autism. BMT motivates a child to perform a desired task and immediately rewards the child for its completion (Joseph, 1993). It is based on the operant conditioning model, which in turn is based on the belief that all behavior is learned as a result of the consequences it produces (Powers, 1989). Teaching strategies that do not follow this model, such as humanistic or cognitively based programs, would be inappropriate for an autistic child. If a behavior brings about positive results, a child will increase the behavior. If it produces a punishment, the behavior is likely to decrease. BMT is based on observable behaviors. If it cannot be seen, it is not considered. No references are made as to what the person may be thinking or feeling in a BMT program. The procedures are easy for professionals to teach and for parents to learn. Paula Jackson, an elementary school counselor, said in a brief interview, "Behavior Modification is incorporated into the classrooms and related services of our autistic students. They seem to understand the

reward systems. It is an easy strategy to understand and is very cost effective."

Two major components of BMT are continuous repetitions of a task until a change of behavior is noted, and immediate reinforcement so that a connection is made between the task and the positive consequence (Joseph, 1993). There is more to this type of program, however, than positive reinforcement and punishment. Other learning principles within behavior modification are shaping, extinction, time-out, and response cost.

Shaping involves separating a task into its component parts and then reinforcing the completion of each component until the entire task is learned. This is the approach to use if the behavior that is being taught is not exhibited by the child at all (Martin & Pear, 1992). Positive reinforcement, presenting a desired consequence after an appropriate behavior, is used when trying to increase an already learned behavior. For example, if a speech-language pathologist wanted to teach a child to say "happy" through shaping, she would first have the child imitate /h /. When the child produced this correctly, it would be reinforced. The specific reinforcement that is used varies with the child. The /pi/ would then be added, and the child would only be reinforced for producing the entire word. This is a long and tedious process, but in the end a new behavior, or, in this case, a word, will be established. Dr. Ivar Lovaas of the University of California researched the results for treatments for autistic children for fifteen years and found operant conditioning or behavior

modification training to be significantly effective.

Extinction is a way to manage inappropriate behavior. This strategy involves ignoring the child completely when he exhibits the problem behavior. The adult must appear totally unaware that it is even occurring and then, after the episode is over, never make a reference that it has even happened (Powers, 1989). This is based on the idea that once the attention is removed, the child will be less motivated to perform the unwanted behavior. Paula, the mother of the child with autism, responds to the idea of extinction by saying,

It took me a long time to learn which behaviors Sam couldn't control and which ones were intentionally manipulative. First, I was very hard-line and he got punished for everything. Then, I was too easy and he got away with everything. Now we have reached an equilibrium. When I know a behavior is manipulative, I ignore it. If he doesn't want to do something, he spits. I use extinction whenever possible. (3/6/96)

The disadvantage with extinction is that the negative behaviors often increase before a reduction is noted (Powers, 1993). Also, it is not appropriate for self-injury behaviors. An adult cannot ignore a child that is banging her head on the floor. A common behavior of autistic children is screaming. If parents determine that the primary purpose of the screaming is to get their attention, extinction would be an appropriate and effective technique. Also, sometimes autistic children may scream in speech therapy sessions in response to requests made by the speech-language pathologist. "An observant teacher can differentiate between screaming to communicate and screaming to avoid doing a task the child does not want to do. If a child screams or spits

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during a lesson, the teacher must keep on teaching as if nothing has happened. If teaching is stopped, it reinforces bad behavior" (Grandin, 1988). If the therapist feels this is an avoidance technique, it would be best to continue the lesson as if the screaming were not occurring.

Time-out, or physically removing the individual from the difficult situation, is another strategy for managing behavior (Martin & Pear, 1992). This strategy is often used by speech-language pathologists during therapy sessions to teach children to focus on the learning tasks that have been prepared. The time-out area should be nearby, and the child should be required to remain there one minute for each year of his functional age. The adult should not speak with or look at the child during the time-out session. If the child attempts to get away from the area, the parent should present a negative consequence and return the child to time-out. After several trials the child will learn that he must stay in time-out. Paula explained her experience with time-out: "Once Sam learned what time-out meant, it worked. It decreased his bad behavior." This technique is not appropriate if the child is trying to avoid doing an undesirable task.

Response cost is another learning principle of behavior modification that is successful for working with the autistic child. In this type of program the child earns a desired item, such as stars or check marks, when she acts in a desirable manner. This strategy is also incorporated when teaching communication skills. The child may receive a sticker for imitating a word

correctly or for producing a new sound, but one will be taken away if she becomes disruptive. When she does not act appropriately, these items are removed from her record. At the end of a designated amount of time, the child may be able to exchange her items in for a tangible reinforcer, such as a toy (Martin & Pear, 1992). A school-age child with autism may not be motivated by social approval or praise, but he may be able to act in an appropriate manner for a ball or other toy.

Behavior modification does not require fancy equipment or skills. The techniques behind it are simple, but when combined with specially designed language or speech activities, communication skills can be acquired. The techniques are also adaptable to other abilities parents or professionals want the autistic child to develop. This is a distinct advantage because parents do not have to learn new skills for each area of training with their child. "The combined experience of other parents has shown that behavior modification techniques are the most effective means of changing the behavior of children with autism" (Powers, 1989).

Facilitated Communication

Facilitated communication, in particular, is the subject of much debate. FC was designed to help individuals who previously could not or had difficulty with communication. "FC is communication by a person in which the response of that person is

expressed through the use of equipment and is dependent on the assistance of another person" (Mulick, Jacobson, and Kobi, 1993). The aspects of FC include a facilitator who provides physical support for the subject's hand, wrist, elbow, or shoulder, and a symbol system. The symbols may be letters, words, or pictures and can be on anything from a piece of paper to a computer keyboard (Dillion, 1993). The procedure requires the facilitator to progressively decrease the amount of assistance she is providing until the individual is able to communicate on his own (Mulick, Jacobson, & Kobe, 1993). In addition to physical support, the facilitator should also be emotionally supportive by encouraging the subject to continue the message formulation and to try again when there has been a mistake. Also, it is recommended that the facilitator provide communication support as well. The first message exchanges should require simple, predictable responses on the part of the subject. By reducing the communication demands, one increases the likelihood of success for the autistic individual and therefore increases his confidence in using FC (Duchan, 1993).

FC was designed by Rosemary Crossley in Melbourne, Australia, in the 1970's at the Dignity Through Education and Language Communication Centre. Douglas Bilken, director of special education and rehabilitation at Syracuse University, brought the FC system into America (Dillion, 1993). Some people claim it has been a miraculous cure for the communication problems of the autistic. Others believe that the only reason a message is even formed is due to the influence of the facilitators.

Speech-language pathologists (SLP) are the primary clinical promoters of facilitated communication (Mulick, Jacobson, and Kobi, 1993). These professionals base their success on a different method of research than those who believe that FC is a fraud. SLPs use naturalistic observation, descriptive reports, and case studies to support their claim that it is a valid form of communication. Using this method of research, Crossley reported that 77.7% of her autistic patients were able to communicate at the sentence level using FC after only three training sessions. Bilken found that out of twenty-two autistic children, all possessed communication skills at the end of two years with FC (Duchan, 1993). If these results are true, facilitated communication would be the "miracle cure" for the lack of communication in the autistic population. Many SLP's believe that one must study a technique in the environment in which it naturally occurs in order to get accurate results. Alterations to the environment decrease the effectiveness and therefore cause the autistic individual to communicate less.

The other method of research used to study FC is experimentally based. These studies alter the information the facilitator receives. The blind condition, whereby the facilitator is unaware of what type of response the subject is supposed to develop, is compared to the non-blind condition, in which the facilitator does know the communicative context. The blind condition may also be compared with the distractor experience in which the facilitator is given slightly different information about the communicative context than the autistic child. Most of the

results using this method of research have been negative. One study found that in the blind and distractor conditions, out of forty-two subjects, none of them could correctly name any of the pictures presented using FC. They correctly identified fourteen of sixty pictures, only when the facilitator was shown the same pictures. In twelve out of sixty instances, subjects named a picture the facilitator had seen but that they had not (Duchan, 1993). Based on these and other similar findings, many people believe that the only reason FC ever appears to be effective is because the facilitator is directing the message.

"The FC perspective directly challenges neurophysiological and linguistic perspectives, founded in a large body of scientific research" (Mulick, Jacobson, & Kobi, 1993). FC is based on a normal language structure. Those that are against it believe that the speech and language of the autistic child may not be based on this same structure because of neurological differences. The child may use what is said to her differently because she does not perceive the pragmatic aspects that accompany a message. Many of the people who oppose facilitated communication claim that the system requires autistic individuals to have highly developed language skills, such as taking another person's perspective, expressing emotions, and assigning emotions to those around them. Language of the autistic, if present at all, is usually more concrete in nature (Mulick, Jacobson, & Kobi, 1993). T. Grandin, an individual who has recovered from autism, writes, "Words are too abstract to be remembered. I need concrete images" (1988). Even

if the autistic child is communicating his own messages, the audience may be interpreting the information based on their language ability instead of the autistic person's ability.

Dillion criticizes FC even further in her article "Facilitated Communication, Autism, and Ouija." In this work she compares FC with the Ouija board. They may look alike since both have boards with the alphabet or numbers. Also, both have a pointing system. In FC the claim is that the subject provides the guidance for the pointer. With Ouija, it is directed by a spirit or a person's inner self. Finally, while participating in both FC and Ouija the subject does not necessarily have to have his attention focused on the board itself. Dillion explains, "My sense is that in FC the movement may indeed come from the subject as a conditioned response, but that direction to a particular letter comes unwittingly from the facilitator" (1993).

Promoters of facilitated communication explain this inattentiveness of the subject with three possible hypotheses. First, the autistic individuals may be focusing on things around them while they consider the message in their minds. Second, their attention could be split between the message and something occurring in the environment. Last, the autistic persons may be looking away but focusing on the activity with their peripheral vision. These explanations are based on assumptions of what the persons could be thinking, but there is not any way to prove it. A behaviorist would simply see the children's lack of attention and say that they are not communicating their own ideas.

Neither side of the facilitated communication debate can offer any real solution or compromise. Duchan (1993) suggests a collaborative view of communication: "Within this framework partners are seen as working together to accomplish goals of communication." This view takes into account both naturalistic and experimental research by proposing that the autistic person is successful in communication when provided with enough support. If the conditions are not right, the person will not be able to display his abilities. Individuals using FC can be both good and bad communicators (which corresponds to the research), depending on the environment in which they are performing. How effective is an intervention strategy, such as facilitated communication, that can not be used independently, or in certain situations, by the child? The purpose of teaching children to communicate is to allow them to be a part of and contribute to their environment. If they must always have a partner, they will never fully understand the joy of being able to express their own ideas. Schulze details his experience using FC with his own son: "Jill and I see the potential of facilitated communication. Indeed, we have tried the method again and again with Jordan over the past few years. But we must be honest in reporting that it hasn't worked with Jordan, and claims of others that we have observed remain an unproven hypothesis" (1993).

There are many perspectives on facilitated communication. There are those who oppose it, support it, and those who stand somewhere in between. The fact still remains that it is an

unsubstantiated method of developing language within the autistic child. If shaping and positive reinforcement were used in conjunction with FC, the child might be able to learn the pointing system involved in this program in order to do it on his own. This strategy would likely reduce the questions about the effectiveness of facilitated communication.

Picture Exchange System

The Picture Exchange Communication System (PECS) is another intervention strategy that is effective for developing the communication skills of the autistic population. PECS was developed by L.F. Ryan and A.S. Bondy at the Delaware Autistic Program (DAP), and is used statewide in the public school system. It is something of a spin-off from facilitated communication, but there is no need for a facilitator, and behavior modification principles are embedded within the nature of the program. Ms. Miller suggests, "I prefer to use behavior modification in combination with other strategies. It has good things to offer" (3/6/96). Therapists using this technique give a picture of a desired object to their communication partner to get a particular idea across (Bondy & Frost, 1990). Pictures are used, just as in FC, but "the pictures are handed to the person the child is communicating with because it is more interactive than having the child point" (1990). This system can be used with subjects from two to twenty-one years of age. PECS has advantages over the

manual communication approach that has been used with young children with some success. Sign language also requires that the communication partners be fluent in signing, because if it is not consistently used, the child will not be able to learn it.

PECS does not require any new language to be learned because almost anyone can understand a picture. Also, some children lack the necessary motor skills to perform manual communication. PECS does not demand difficult motor coordination. PECS promotes the acquisition of speech. Sixty-seven percent of children who have used it for more than a year have substituted intelligible speech for the pictures.

There is a series of steps to follow when beginning to use the Picture Exchange Communication Systems (Simmons, 1994). First, it is necessary to choose reinforcing items for the child. These may be food, toys, or activities the child finds rewarding. It is extremely important to find something that is truly reinforcing for the autistic child, not just something the trainer believes will be rewarding. Sensory reinforcers may be the most effective because social reinforcers, such as praise, may not be understood. Sensory reinforcers include food, spinning or turning toys, or music. The second step is to make a grid with pictures of the items that are found to be reinforcing. The pictures should be attached to thick cardboard and have velcro put on them. This allows them to be removed and reattached to the communication board.

The caregiver or supervisor begins to teach the exchange next. The initial communication behavior targeted is requesting.

The only prerequisite to request training is the identification of those items or activities that are present on the board (Bondy & Frost, 1995). To teach the request, one should place a reinforcing item within the line of sight of the child, but where he cannot get to it. Only the picture of that object should be put on the communication board. The child is then physically prompted to take the picture off the board and give it to the trainer. Then the item in the picture should be given to the child. The number of physical prompts and environmental cues will gradually decrease as the child learns the process through shaping. Eventually the child should be able to make requests independently. The space between the child and the picture should be increased so that it takes more effort to initiate a request. Also, the distance between the child and the trainer should be increased for the same reason. This way the trainer can be sure the child is understanding the purpose of communication by his observable behaviors.

The final step in the PECS process is to teach discrimination. This is done by putting two very different pictures on the board. One should be reinforcing and one should be punishing. When the child chooses the correct picture, the item should be presented. He is being rewarded for selecting the correct picture and for initiating communication. The picture should then be replaced in a different location on the board. As he learns to decipher between the pictures, the number of them should gradually increase.

These four basic steps can be slightly altered to teach different sentence structures. Commenting, beginning with "I see" or "I have," is usually the next sentence type learned. Since the child is not asking for anything, the comments have to be socially reinforced. They may take longer to acquire and maintain because the rewards are less obvious to the autistic child. Ideally, conversation becomes the motivation and reinforcement for the child's efforts to communicate.

The Picture Exchange Communication System incorporates the ideas of positive reinforcement, punishment, and shaping into the teaching strategies. For this reason it has been effective in increasing the communication of children with autism. It is a very flexible technique that can be used to teach communication and social interaction in the home, school, day care, or practically any other setting. It is inexpensive and can be easily understood by parents or professionals working with the child.

Sensory Integration

Another strategy that has been used with the autistic population is a therapeutic technique known as sensory integration. This is used to correct the sensory integrative dysfunction that many autistic individuals experience. "Sensory integrative dysfunction occurs when sensory information from the environment is not accurately interpreted or organized by the brain", (Edelson, 1995). It can result in developmental, behavior, and processing

difficulties, all of which are concerns for individuals with autism. Sensory integration training includes the tactile, vestibular, and proprioceptive senses because they all work together to allow us to perceive and experience stimuli from our surroundings. Tactile dysfunction is demonstrated by a hyper- or hypo-sensitive reaction to touch. The individual may withdraw because of the fear of being touched or may even be unable to eat food with a certain texture. The proprioceptive system is composed of the parts of the muscles, joints, and tendons that monitor body posture. It is also responsible for motor planning. Dysfunction in this area is recognized through excessive falling, odd body positions, and a small amount of crawling as a child. The vestibular system is the last system within the sensory integration training program. It is composed of the structures of the inner ear. Problems in this area may cause a fear reaction even to very basic movements or may cause the person to need very intense movements to stimulate the vestibular system at all.

Treatment of these sensory integrative difficulties is done with three general goals in mind: to give the autistic child sensory information that will aid in the organization of the central nervous system, to help the child monitor sensory information, and to assist the child in understanding a more appropriate response to stimuli. Auditory Integration Training, a more concentrated type of sensory integration, also attempts to meet these goals. Both of these processes are very cognitively based. There is no way to observe if any organization within the

central nervous system has taken place. Also, it is impossible to determine clearly if a child is able to appropriately monitor sensory information. There has been limited success with these techniques. Sensory integration training attempts to change systems within the brain to change behavior. In actuality, behavior modification training must be used to change behavior.

Auditory Integration Training

Auditory Integration Training was developed by Guy Beard in Annecy, France. He determined that auditory processing difficulties occur when an individual is unable to hear various frequencies with the same intensity. Some frequencies within the same sound may seem painfully loud. If a sound is perceived by an individual with autism in this form, it will more than likely disrupt the ability to process auditory information. The frequencies that cause these painful reactions are known as auditory peaks, and many people with autism have one or more.

"Auditory Integration Training is accomplished by a device which randomly selects high and low frequencies from a music source, and then sends these sounds via headphones to the trainee" (Edelson, 1995). The frequencies that cause hypersensitivity for the individual are at least partially filtered out. A hearing evaluation is done prior to the training to determine the auditory peaks. The subject listens to the music for half an hour at a time, two times each day. For people with articulation or language

problems, such as the autistic population, the intensity of the sound is decreased in the left ear after five hours of equal intensity in both ears. The higher volume level in the right ear is thought to stimulate the left hemisphere, which is responsible for speech and language development. After the first five hours, another hearing evaluation is done to determine if any of the auditory peaks have been changed or eliminated. After an additional five hours of listening, all frequencies within the music, and therefore the environment, should be perceived equally.

The subject may experience other changes as a result of the Auditory Integration Training. Some people experience agitation, hyperactivity, and mood swings during the therapy. If the child experiences behavior problems, the training will not be successful. Extinction, time-out, or response cost strategies may be important to include to control these side effects of the training. It is important to note that the music should not be played while the child is in time-out, because then the training would become associated with the punishment. "Other behavioral changes may include an increase in emotional behavior (anger, crying, reacting to other people's crying), independence (leaving an area without permission, and social growth (increased interaction)" (Edelson, 1995). If Auditory Integration Training is able to minimize the appearance of auditory peaks and increase the processing abilities of individuals with autism, it can not do so without behavior modification strategies to decrease the associated inappropriate behaviors.

Autism and the Family

Behavior modification is an important strategy to use when working with autistic children. It should be a part of every successful intervention program. Programs without it, such as facilitated communication, are subject to much question and controversy. Behavioral techniques can be easily incorporated into the daily life of families with autistic children. Intervention strategies should help to decrease the stress that is very much a part of every home with an autistic child. The demands on these parents are great, and the easier the strategy is to understand and implement the better. Professionals working with the autistic population with any intervention strategy should be aware of the effect they have on the entire family. "Most important of all, the family needs to be emphasized as a group participating in the program decisions for the affected individual. The entire family will be affected by the decisions made and should be consulted and counseled as the need arises, before the level of stress becomes harmful" (Norton & Drew, 1994). Any therapy should focus on the needs of the family as a unit because as the abilities of the autistic member change, so does the way the family lives.

Receiving the diagnosis that one's child has autism has been compared with the impact of hearing that a loved one has passed away. An interventionist working with a family that has recently received the news should be aware that they may be experiencing the

stages of the grief cycle. These stages are shock, realization, defensive retreat, and finally acceptance of the autism diagnosis (Norton and Drew, 1994). Immediately their lives have changed. There is an increase in medical and other expenses, possibly a sense of isolation from the community and friends, and a significant change in daily routine. Receiving consistent therapy contributes to the disruption. Professionals should attempt to make the sessions and home activities as convenient and easy to implement as possible. Ms. Miller, a parent with an autistic child, discussed working with professionals by saying, "After the diagnosis, all your dreams for your child are shattered. Professionals should be in touch with the needs of the family, because they change. They shouldn't pretend to know everything, either. Empower the parents. Make them feel in control by directing them to where the knowledge can be found. The more information I have, the less afraid I am."

Autism is a complex disorder with many characteristics that may or may not be present in an individual who has been diagnosed. The cause is unknown. There are several hypotheses, but none has been proven to be the sole reason autism develops. Until there is a clear understanding of what triggers the development of this disorder, all that professionals and parents can do is address the symptoms. One common deficit is in the area of communication. Several intervention strategies, such as facilitated communication, picture exchange systems, and sensory integration techniques have

been developed to improve communication skills. Despite technological advances, behavior modification still proves to be the most effective therapy strategy. Some new approaches do work, such as picture exchange systems, or could work, such as facilitated communication, when behavior modification techniques are incorporated into the program design.

When working with an autistic child with any intervention method, it is important to remember that the technique not only changes the child but also the family. Living with an autistic child is very different from working with one a few times each week. Professionals should be sensitive to the needs of the entire family, for it is their goal to meet them. Charles Schulze, writing about his autistic son, said, "... he reminds me of the most frightening element of all--that the power to alter any of these outcomes may be completely beyond my control" (1993). Parents and professionals working together do have the power to alter and improve the lives of the autistic population.

APPENDIX A

FAMILY VISIT

I spent ten hours with the Miller family of Glasgow, Kentucky, on 12 April 1996. I arrived at their home at 10:00 a.m. and stayed until 8:00 p.m.. Ms. Miller indicated to me on the phone the day prior to my visit that she was nervous about my coming. After only a few minutes with her two children, I believe she was more at ease. Paula is a single mother with two children. Sam is two and was recently diagnosed with Pervasive Developmental Disorder. Logan, her daughter, is four years old.

Logan began to show me around the small, three-bedroom house as soon as I walked in the door. Sam followed us wherever we went. We stayed in Logan's room and played with her toys for about an hour. Sam had an extremely difficult time sharing. Many times Logan had to give up something she wanted to play with so that Sam wouldn't throw a fit. She was very good about it and would simply find something else to play with. Sam could remain occupied with the same toy for an extended amount of time. He especially enjoyed playing with trucks. He loved to hold the

trucks and watch their wheels spin. He also liked to rub the wheels across his face. This need for tactile stimulation is a characteristic of autistic behavior.

Our next event of the day was a visit to the park. Sam hated being confined in his car seat while driving to the playground. Once there he played very independently. He was very repetitive about sliding down the slide. When he began an activity, it was very difficult to divert his attention. This is another very common trait of children with autism. He ate his lunch on the playground as well. He was very ritualistic about how his food should be placed on his plate and the order in which he ate it. Chicken was first and only a few chips could be on his plate at a time.

Leaving the park was an interesting experience. Sam was obviously not ready to go. He threw a temper tantrum when Paula said they were leaving. She used the strategy of extinction. She continued to pack up their belongings despite Sam's screaming. Paula and Logan walked out of the park, and Sam eventually followed in fear of being left behind. She praised and reinforced him with a drink when he got into the car. Paula explained that she had tried other methods to get him to leave, but this simple behavior modification method worked the best.

Sam was worn out by the time we got to the house. He lay down for a nap, while Paula, Logan, and I watched television. Logan is very verbal and a well behaved child. She sets a wonderful example for Sam as to how children should behave. She entertained herself by making beaded necklaces while Paula and I

talked.

At 2:30 it was time to take Sam to therapy at Lifeskills. Paula gradually allowed Sam to wake himself up, in an effort to make him feel in control of the situation. By the time we arrived at the center, Sam was feeling more alert. He attended a session with an early interventionist that was based on creative play. Sam was very cooperative and had no difficulty separating from his mother. The clinician had to allow Sam to initiate most of the tasks for them to be successful. She also used a lot of positive reinforcement when Sam met an objective.

We stayed at Lifeskills until approximately 4:00. Sam was very happy to see his mother and sister return from the grocery store. When at home again, the children and I watched cartoons while Paula talked on the phone and began dinner. I played Simon Says with the children and was very impressed by the receptive language ability of Sam. He could follow most one-step directions very well. Logan very much enjoyed playing with and teaching her younger brother. These siblings appear to have an above-average relationship.

I ate dinner with the family. Logan ate very little, and Sam would eat nothing else but macaroni and cheese. If he used gestures to request for more, Paula would allow him to have it. He was being reinforced for initiating a communicative interaction. The children both left the dinner table to brush their teeth and to play in the bath tub together. Paula and I cleaned up the kitchen.

We talked for awhile before I had to leave. She expressed

that she was very concerned about being able to provide for her children in the future. She wants them to lead normal lives, but is concerned as to how she alone will finance it. Also, she is concerned about the development of Sam's expressive language. They will soon begin the Picture Exchange Communication Systems with him. She hopes with the help of behavior modification approaches, Sam will be able to learn to use this system to communicate to others in his environment.

There were several things that I would not have learned about this family if I had not spent an entire day with them. First, I didn't realize what an ordeal it was just to go out and run a quick errand. Paula had to try to get the kids ready and then deal with Sam's fussing about being in his car seat. Logan was cooperative, but she would move very slowly.

I never expected Paula to lose her patience because at the Child Development Center she always seemed to be the most caring mother. There were a few instances that caused her to become very frustrated. When Sam spilled a drink all over the kitchen floor and himself, Paula raised her voice at him. When Logan was poking along to the car to go to therapy, Paula yelled at her to hurry up. The most frustrating thing for Paula was when her father called to cancel plans he had with Logan for the evening. Paula absolutely lost it. She yelled at him through the phone and even began to cry at one point. The interesting thing was that when Logan's grandfather told her about the cancellation she handled it fine. I believe she didn't get upset because she wanted to keep Paula from becoming more enraged.

Without this extended family visit I would not have been able to fully understand the difficulties that occur when raising a child with autism. There is rarely a moment's peace from Sam's demands. He makes his needs known, whether they be for a toy, food, or anything else, and he expects them to be met immediately. If they are not, Paula has to deal with a screaming fit. I also would not have known the joys of living with a child with autism. Sam is very affectionate and gives his mother hugs and kisses frequently. Also, the joy one feels when he finally accomplishes something Paula and his therapists have been working on for months is very rewarding. It is very interesting to see the difference training and behavior modification can make in Sam's quality of life.

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This manual provides a widely accepted and very detailed definition of autism.

Autism Society of America (1994). Services and Benefits. Bethesda, MD.

This article gives important statistics about the prevalence of autism. Also, the the benefits of placing the students in public school are addressed.

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Dalrymple explains the importance of reinforcement when working with individuals with autism. She discusses the types of reinforcers and which ones are usually the most effective for working with this population.

Dillion, K. (1993). Facilitated communication, autism, and ouija. Skeptical Inquirer, 17, 281-288.

Dillion compares FC to the ouija board and claims that it is no more effective at developing communication skills. The two procedures are similiar in appearance and technique. This is an

important article to support my thesis statement.

Duchan, J. (1993). Issues raised by facilitated communication for theorizing and research on autism. Journal of Speech and Hearing Research, 36, 1108-1120.

This article reviews the diversity of opinions related to the effectiveness of facilitated communication. Duchan offers a collaborative view of communication and other theories to explain phenomena produced by facilitated communication. For example, sometimes FC users appear inattentive to the message they are producing. This article attempts to give possible reasons for this behavior.

Edelson, S. (1995). "Auditory Integration Training." Oregon Center for the Study of Autism. no net address.

This article explains in detail the process, goals, and possible results of auditory integration training. This is my main resource for this intervention strategy.

Edelson, S. (1995). "Overview of Autism." Oregon Center for the Study of Autism. no net address.

This article from the Internet provides very important basic information related to the incidence, major characteristics, causes, physical and sensory abnormalities, cognitions, and interventions related to autism. It was most helpful by giving ideas for areas to research further.

Frith, U. (1993). Autism. Scientific American, 268, 108-115.

This article describes autism as a biological defect that causes specific characteristics. Common traits are a decrease in communication and sociability. Kanner, in 1943, was the first person to label individuals as autistic. This article is important to establish an overview of the disorder.

Grandin, T. (1988). Teaching Tips from a Recovered Autistic, Focus on Autistic Behavior, 3, 1-8.

Only a small amount of information from this article was applicable, but Grandin does address learning to speak. She emphasizes the importance of the instructor's ability to interpret the child's behaviors during teaching sessions.

Joseph, M. (1993). "Behavior Modification for Autism." Insurance Claim. Damian Porcia XPMF51A@Prodigy.COM

This article is actually an insurance claim defending the need for funding for behavior modification therapy services. Joseph provides vital information and statistics that support the effectiveness of the intervention. There is a specific section that discusses using behavior modification for the treatment of

autism. He gives several possibilities for the cause of this disorder and lists characteristics. Behaviors that are warning signs for autism in infants and young children are also included. Behavior modification is effective when working with this population.

Simmons, M. (1994). "Information Sheet and Guidelines: Picture Exchange System." LEAP Preschool. no net address.

This was my most important resource for the picture exchange intervention strategy. This article clearly outlines each step within the design and procedure of the program. Helpful illustrations are also included.

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Mulick, J., Jacobson, J. & Kobi, F. (1993). Anguished silence and helping hands: autism and facilitated communication, Skeptical Inquirer, 17, 270-279.

Facilitated communication tries to improve the communication of children through the use of equipment and help provided by other persons. It presents experimental research that supports the idea that it is an ineffective technique for increasing the independence of the communication of autistic individuals.

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This article discusses the effects upon a family which receives an autism diagnosis their child. Everything from finances to daily living is altered. It is important that professionals consider the needs of the entire family as they implement therapy procedures.

Powers, M. (1989). Children with Autism: A Parent's Guide. Rockville, MD: Woodbine House.

This is a very comprehensive book and one of my most valuable resources. The chapters about adjustment to the diagnosis and living with a child with autism were especially important. Powers addresses the grief cycle parents experience when they discover their child has autism. Also, he explains how to use behavior modification techniques to reduce inappropriate behavior.

developmental disorders: some concepts and practical considerations. Journal of Autism and Developmental Disorders, 22, 459-482.

Rutter and Schopler give a brief description and history of autism. They also discuss possible causes of the disorder. This information was important for the introduction of the thesis.

Schulze, C. (1993). When Snow Turns to Rain: One Family's Struggle to Solve the Riddle of Autism. Rockville, MD: Woodbine House.

Schulze writes about his experiences raising his seven-year-old son, Jordan, who has autism. This book is very helpful when trying to understand the real obstacles families go through when dealing with this disorder. Schulze discusses using facilitated communication with Jordan. He supports the claim that it has potential, but was ineffective for his son.