Rowan University

Rowan Digital Works

5-9-2002

The effects of the Picture Exchange Communication System (PECS) to decrease impulsive behaviors and increase self-management skills of children with autism

Lori A. Rizzo-Wise
Rowan University

Recommended Citation

Rizzo-Wise, Lori A., "The effects of the Picture Exchange Communication System (PECS) to decrease impulsive behaviors and increase self-management skills of children with autism" (2002). *Theses and Dissertations*. 1504.
https://rdw.rowan.edu/etd/1504

THE EFFECTS OF THE PICTURE EXCHANGE COMMUNICATION SYSTEM

(PECS) TO DECREASE IMPULSIVE BEHAVIORS AND INCREASE SELF-

MANAGEMENT SKILLS OF CHILDREN WITH AUTISM

By
Lori A. Rizzo-Wise

A Thesis

Submitted in partial fulfillment of the requirements of the
Masters of Arts Degree
Of
The Graduate School
At
Rowan University
May 9, 2002

Approved by _____

Date Approved ___5/9/2002___

ABSTRACT

Lori A. Rizzo-Wise
The Effects of the Picture Exchange Communication System (PECS) to Decrease
Impulsive Behaviors and Increase Self-Management Skills of Children With Autism.
2001/02
Dr. Joy Xin, Thesis Advisor
Masters of Arts in Special education

The Picture Exchange Communication System (PECS) is an augmentative

communication system used for children with autism and social-communication

disorders.

Self-management is an intervention extensively documented for its effectiveness

to improve behavior. Self-management programs typically involve some combination of

two or more of the following strategies: self-monitoring, self-evaluation, and positive

reinforcement. With limited knowledge of growth in self-management techniques among

autistic children, the study of PECS and its influence on self-management may be a

beneficial technique to increase appropriate behavior/classroom management.

The purpose of this study was to demonstrate the decrease of impulsive behaviors

while teaching self-management skills to children with autism through the use of the

Picture Exchange Communication System. Two students with autism in a self-contained

classroom participated in the study. A multiple-based line design was used and behavior

observations were conducted across baseline, intervention and generalization phases.

The results showed consistent evidence that the Picture Exchange Communication System increases self-management skills while decreasing impulsive behaviors of children with autism. Though evidence was consistent, results will vary due to the nature of autism and inconsistencies in behavior.

MINI-ABSTRACT

Lori A. Rizzo-Wise
The Effects of the Picture Exchange Communication System to Decrease
Impulsive Behaviors and Increase Self-Management Skills of Children with Autism.
2001/02
Dr. Joy Xin, Thesis Advisor
Masters of Arts in Special Education

This study was conducted to demonstrate the decrease of impulsive behaviors while increasing self-management skills of children with autism through the use of the Picture Exchange Communication System (PECS).

The study found consistent evidence that the Picture Exchange Communication System increases self-management skills while decreasing impulsive behaviors among children with autism. Though evidence was consistent, results will vary due to the nature of autism and inconsistencies in behavior.

WHAT A PRIVILEGE TO DEDICATE THIS
THESIS TO MY FAMILY:

My husband, Jim
My mother, Carolyn
My father, Albert
My brother, Michael

THANK YOU FOR YOUR
UNCONDITIONAL LOVE AND SUPPORT
THAT HAS GUIDED ME TO WHERE I AM TODAY.

TABLE OF CONTENTS

LIST OF TABLES / FIGURES

Chapter I

Introduction

Statement of Problem

Autism is a relatively common developmental disorder diagnosed clinically on the basis of pervasive and qualitative impairments in communication, social interaction, and range of interests and activities (William, 2000). It is identified four times greater in males than females and diagnoses are based upon criteria listed in the Diagnostic and Statistical Manual (American Psychiatric Assoc, 1994)).

Social and communication deficits with stereotypic and ritualistic behaviors characterize autism (Williams, 2000). Most children with autism are recognized, as having a form of attention deficit with minimal sleep required. They have abnormal reaction to stimuli, visually or auditory, with an insensitivity to pain and fear (Williams, 2000). Autistic children tend to be tactile defensive and engage in self-stimulatory behaviors (e.g. rocking, hand flapping, and leg shaking). Often they will display self-injurious behavior such as biting, head banging, and pinching (Williams, 2000).

Social skill deficits are due in part to the autistic children's inability to communicate appropriately within the environment (Williams, 2000). Children with autism generally have difficulty with both verbal and non-verbal communication (Rapin, 1991). For example, some autistic children develop speech accompanied by impairments in sustaining and/or initiating a conversation while other children do not develop verbal language.

There are many techniques used to assist autistic children with communication skills. One technique is facilitated communication training, a method of assisting people with severe developmental disabilities to communicate (e.g. computer devices). It is a way for an individual to communicate by giving physical assistance to allow him/her to type language on a keyboard device that gives output in a computer voice (Cafiero, 2001).

Another technique is known as functional communication. It is an intervention strategy that uses communicative behavior as a functional alternative to inappropriate behavior (e.g. ability to express needs and/or wants without acting out). Functional communication has been used to reduce behaviors such as aggression, tantrums (Carr & Durand, 1985), stereotypic behavior (rocking, stimming), and other communication disorders (Carr & Durand, 1985). A recent approach to facilitating language development and communication for children with autism is the Picture Exchange Communication System (PECS) (e.g. picture vocabulary) (Frost & Bondy, 1994). The goal of PECS is to spontaneously initiate communicative interactions. The system is primarily used with individuals who either do not use speech or speak with limited effectiveness. PECS was originally developed for use with young children with autism, pervasive developmental disorder, and social-communication deficits (Frost & Bondy, 1994). It is currently used with all ages and with variety of communication disorders (Bondy & Frost, 1994).

Managing behaviors of autistic children requires the use of individualized techniques (Mitchem, 2001). To date, there are a number of techniques, of which one is self-management. Self-management programs typically involve some combination of

two or more of the following strategies: self-monitoring, self-evaluation, and positive reinforcement (Mitchem, 2001). These strategies are not commonly displayed among children with autism, however, the use of reinforcement systems is greatly recommended (Bondy & Frost, 1994). A successful self-management program combines the strategies to teach students' responsibilities for their own social behavior and academic performance (Koegel & Koegel, 1990). This displays self-management as an appealing class-wide strategy to promote the inclusion of students with disabilities as well as to improve classroom behavior of all students in the classroom. Due to the intuitive appeal of self-management as an inclusive strategy, it is interesting to note that relatively few studies have investigated the class-wide self-management programs in general education environments rather than special education settings. There are also few studies conducted using self-management strategies with autistic children.

Background

Autism was first described as a clinical syndrome by an American child psychiatrist, Leo Kanner, in 1941(Andolsek, 1998). The term "autism" comes from the Greek word "autos", meaning "self", and is used in psychiatry to mean withdrawn and self–absorbed (Andolsek, 1998). It was first believed that autism was the early stage of schizophrenia, but is known now that they are two distinct disorders. Kanner gave the name "early infantile autism" to describe the disorder, because he thought that it always began in infancy. It is known now that one third of autistic children had a period of normal development up until 12or 18 months of age (Mauk, 1993).

Autism affects about three to four children out of 10,000 (Mauk, 1993) and it affects boys four times than girls (Siegal, 1996). It is reported that in the United States alone, up to 115,000 children between the ages one to fifteen are affected by autism (Andolsek, 1998). Individuals with autism show levels of intelligence to be low with 30% with an IQ of 70 or better (Mauk, 1993; Rapin, 1991). Autistic children also have difficulty with both verbal and non-verbal communication (Rapin, 1991).

The Picture Exchange Communication System (PECS) was developed to help children and adults with autism and other developmental disabilities to rapidly acquire functional communication skills (Bondy & Frost, 1994). The system is primarily used with individuals who either do not speak or speak with limited effectiveness.

One of the principle advantages of PECS is the integration of theoretical and practical perspectives from the fields of applied behavior analysis and speech/language pathology (Bondy & Frost, 1994). Several techniques developed within applied behavioral analysis are used as the fundamental teaching strategies. Some of the identified advantages of PECS include:

1. the exchange is clearly intentional and readily understood

2. the child initiates the interaction

3. the communication is meaningful and highly motivating (Frost & Bondy, 1994)

The key to successful use of PECS is in how children are taught to use pictures and other symbols to communicate rather than filling the environment with many pictures. The key to effective teaching is effective staff and parent training (Bondy & Frost, 1994).

Significance of the Study

Special educators who teach children with autism are confronted daily with teaching the students appropriate social behaviors. When teaching such behaviors, teachers are consistently emphasizing the awareness of self-monitoring. Due to characteristics of autism, this is a difficult skill to acquire (Koegel & Koegel, 1990).

With limited knowledge of growth in self-management techniques among autistic children, the study of PECS and its influence on self-management may be a beneficial technique for successful behavior/classroom management. The present study will exemplify the use of PECS to decrease impulsive behaviors while increasing self-management skills of children with autism.

Statement of the Purpose

The purpose of this study is to demonstrate the decrease of impulsive behaviors while increasing self-management skills of children with autism through the use of the Picture Exchange Communication System (PECS).

The specific objectives are to: (a) evaluate the effects of using the Picture Exchange Communication System (PECS) as a functional communication to decrease avoidance/escape behaviors of children with autism; (b) examine the effects of using the Picture Exchange Communication System to increase self-management skills of children with autism.

Research Questions

1. Does the Picture Exchange Communication System have a positive impact on children with autism?

2. Does the Picture Exchange Communication System affect decreasing impulsive behaviors of children with autism?

3. Does the Picture Exchange Communication System affect increasing self-management skills of children with autism

Definition of Terms

In this study, the following terms are defined and listed below:

Autism – neurological based developmental disorder

Impulsive Behaviors – refers to acting on impulse rather than thought, such as hand flapping, verbal stimming (continuos jargoning, rocking)

Picture Exchange Communication System (PECS) – functional communication system through the use of pictures.

Functional Communication – an intervention strategy that uses communicative behavior as a functional alternative to inappropriate behavior.

Self-management Skills – a series of procedures by which an individual monitors and alters his/her own behavior.

Chapter II

Review of the Literature

Introduction

This chapter will review related research articles to address Autism and characteristics of autistic children's behaviors, the Picture Exchange Communication System used for autistic children, and self-management and its attempts to change these children's behaviors.

Autism

Autism was first described as a clinical syndrome by an American child psychiatrist, Leo Kanner, in 1943. The term "autism" comes from the Greek word "autos", meaning "self", and is used in psychiatry to mean withdrawn and self-absorbed (Andolsek, 1998). It was first thought that autism was the early stage of schizophrenia, but it is now clear that the two disorders are separate. Kanner described the children affected by this disorder as being aloof and socially withdrawn. Kanner gave the name "early infantile autism" to describe the disorder, because he thought that it always began in infancy. It is now known that approximately one third of children affected by autism had a period of normal development up until twelve to eighteen months of age (Mauk, 1993). Since the first description of autism, there have been debates whether it is the language or social deficits that are primary in autism (Mauk, 1993).

Autism is a developmental disorder characterized by severe deficits in social interaction and communication, as well as by stereotyped and repetitive behaviors

8

(Williams, 2000). The term "developmental disorder" is used to describe autism because it is believed that the child is either born with the disorder, or has the potential for developing the disorder (Siegel, 1996). Even with today's advanced technologies, the cause of autism is unknown. There are many explanations on the cause of autism. Some feel that autism is a result of food allergies (e.g. casein in cow's milk and gluten in wheat), immunizations (e.g. measles, mumps, and rubella), dysfunction of the immune system, or the presence of candida albican (a.k.a.: yeast) (Williams, 2000). It is widely believed that autism is a neurodevelopment disorder that has a genetic-based etiology (Andolsek, 1998; Rutter, 1996). A shift towards a neurobiological approach began after Rimland's research on twins and autism in 1964 (Courchesne, 1989, as cited in Dawson, 1989). Studies have found that pervasive developmental disorders (PDDs) are related to structural differences in the brain that arise during pregnancy, whether from injury or genetics (Siegel, 1996). Recent neurological studies are focusing on the cerebellum as playing a major role in autism (Siegel, 1996).

It is reported that in the United States alone, up to 115,000 children between ages one to fifteen are affected by autism (Andolsek, 1998). Autism affects about three to four children out of 10,000 (Andolsek, 1998) and affects boys four times more than girls (Siegel, 1996). Autistic spectrum disorders affect ten to fifteen children out of 10,000 (Siegel, 1996).

Studies of intelligence levels have found the mean IQ of the autistic population to be relatively low, but at least 30% of these individuals have an IQ of 70 or better (Mauk, 1993; Rapin, 1991).

In addition to other disorders resembling or occurring with autism, there are other disorders along the autistic spectrum continuum that may have many of the same features, but do not fulfill all of the required criteria for a diagnosis of autism. The term "pervasive developmental disorders" is used as an umbrella term to describe the full spectrum of autistic-like disorders, including typical autism, Asperger's syndrome, Rett's syndrome, childhood disintegrative disorder (CDD), and pervasive developmental disorders, not otherwise specified (PDD-NOS).

While Kanner was presenting his findings on autism in the United Stated, Hans Asperger was in Europe describing a similar disorder that is known today as Asperger's syndrome. Children with Asperger's syndrome have normal or high verbal intelligence, but have many of the same social-emotional characteristics of autism (Siegel, 1996).

Rett's Disorder is a disorder characterized by a lack of interest in social interaction, manifestation of stereotypic behaviors, and a loss of acquired speech (Siegel, 1996). Rett's Disorder has been found to occur only in girls and over half of this population has sleeping difficulties and seizure disorders. Children with this disorder seem to develop normally up to the first six to eight months of life. Characteristics, such as hand patting, involuntary finger movement, or waving may be subtle and unnoticed. Normal development slows and developmental milestones are not met on time. Children with this disorder have difficulty with balance and walking, and will lose already acquired speech skills and the use of purposeful hand movements. Stereotypic behaviors are present with the most prominent being "hand washing" (Siegel, 1996).

Childhood Disintegrative Disorder (CDD) occurs more frequently in boys than girls (Siegel, 1996). Children develop skills, such as language and social skills, normally

up to age two or three. There is then a period of regression that can take only weeks or months to occur. Previously acquired skills are lost and replaced with autistic-like stereotypic behaviors. The diagnosis of CDD is based on the child's early development, which differs from children with autism (Siegel, 1996).

PDD-NOS is regarded as a less severe form of autism. Children diagnosed as PDD-NOS exhibit fewer signs of autism and have less cognitive impairments (Siegel, 1996). This diagnosis is used when symptoms are presented, but are not severe enough or as numerous to fulfill the diagnostic requirements for autism, (Siegel, 1996)

A diagnostic system is essential in the diagnosis of autism. Diagnosis is based on a detailed history and clinical observations with frequent use of structured interviews and observational patterns. The diagnostic system most widely used today is the Diagnostic and Statistical Manual, 4th ed. (DSM IV) (American Psychiatric Association, 1994). The DSM IV is the most recent edition from the American Psychiatric Association. Its criteria for the diagnosis of autism consists of twelve symptoms divided into three categories: 1) qualitative impairment of social interaction, 2) qualitative impairment in communication, and 3) restricted repetitive and stereotyped behaviors, interest, and activities (Rapin, 1991).

Below is the DSM IV criteria outlined by the American Psychiatric Association (1994):

A total of six or more manifestations from 1, 2, and 3:

1. A qualitative impairment of social interaction (at least two manifestations):
   a. Marked impairment in the use of multiple types of nonverbal behavior 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. Lack spontaneous seeking to share enjoyment, interests or achievements with other people
   d. Lack of social or emotional reciprocity.

2. Qualitative impairment of communication (at least one manifestation);
     a. Delay in, or lack of, development of spoken language (not accompanied by an attempt to compensate through alternative modes of communication such as gestures or mime);
     b. In individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others;
     c. Stereotyped and repetitive use of language or idiosyncratic language; and
     d. Lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level.

3. Restrictive and stereotyped patterns of behavior, interests, and activities (at least one behavior manifestation):
     a. Encompassing preoccupation with one or more restricted, repetitive and stereotyped patterns of interest that is abnormal either in intensity of focus;
     b. Apparently inflexible adherence to specific, nonfunctional routines or rituals;
     c. Stereotyped and repetitive motor mannerisms (e.g. hand flapping, or complex whole-body movements); and
     d. Persistent preoccupation with parts of objects

Delays or abnormal functioning, with onset before the age of three years, in at least one of the following areas:
     Social interaction,
     Language as used in social and communication; and
     Symbolic or imaginative play

Assessment for intervention requires an interdisciplinary approach often involving medicine, psychology, speech and language, occupational therapy, and education (Williams, 2000). Typical recommendations for the newly diagnosed child include enrollment in a structured school setting to provide social and developmental models with a focus on attention, imitation, and reciprocal social interaction (Williams, 2000). Speech and language therapy and occupational therapy are often components of the program. Children with autism require individualized instruction with specific and documented strategies and modifications (Williams, 2000).

Characteristics of Autistic Children's Behaviors

Characteristics of autism revolve mainly around stereotypic and ritualistic behaviors, as well as, social and communication deficits (Rapin, 1991). Most children

with autism are found to have some form of an attention deficit, and are likely to have a sleeping disorder. They have abnormal reaction to stimuli, such as noise, and may become fixed on visual stimuli (e.g. lights). Insensitivity to pain is common, however, they are tactilely defensive, and will "arch" or stiffen when touched. They engage in self-stimulatory behavior (e.g. rocking, hand flapping, verbal preservation) and self-injurious behaviors (e.g. hand biting, head banging).

Many children with autism are irritable, anxious, or fearful in specific situations, and may laugh or cry without any obvious external cause. Temper tantrums are likely to occur when there is a change in routine. Fascination with an object and refusal to be separated from the object is common (Williams, 2000).

While communication problems are often a chief concern, the underlying core deficit in autism is believed to be in social behavior (Williams, 2000). This is often most evident in the child's failure to develop typical peer interactions and relationships. Children demonstrate limited functional play and may interact with toys in an atypical fashion (e.g. lining them up, arranging by color, size) (Williams, 2000). Unusual sensory interests are common and may include smelling objects inappropriately or staring at lights.

Social skill deficits are due in part to the autistic child's inability to communicate appropriately with the world around them. Some speak in jargon, delayed and immediate echolalia, or use a singsong voice to communicate. Autistic children seem to have conversations with themselves, and show no desire to participate in conversations with others (Williams, 2000).

Baron-Cohen (1992, 1997) has addressed a concept known as "theory of mind" (Klin & Volkmar, 1992) to explain the deficits to communicate and socialize. It is hypothesized that there is a failure to develop a "theory of mind", which is essential in understanding and predicting what other people think, or that other people might think of them as strange. They do not seem to be phased by social isolation, but seem to seek it. However, older, higher-functioning autistic individuals do become aware of this isolation and may feel ostracized (Rapin, 1991).

Some children with autism never develop speech and must rely on other forms of communication. It is estimated that approximately half of autistic children develop speech, however, their speech develops much later than normal children (Mirenda, 1994). For those children with autism who do develop speech, their speech is different from that of normal children. Echolalia and pronoun reversals are prominent speech characteristics of children with autism (Mirenda, 1994).

Language deficits in autism deal not only with the inability to use spoken language appropriately, but also with the use of language in general. Children with autism have deficits in multiple areas of language such as phonology, prosody, syntax, semantics, and pragmatics (Rapin, 1997, in Andolsek, 1998). Autistic children do not understand pragmatics. They have difficulty in initiating and participating in conversations, and lack the ability to take turns during conversation (Miller, 1996). Mutual gaze (eye contact) is an important part of communication that is not used by children with autism. They instead use gaze aversion in social situation to reduce arousal (Miller, 1996). However, gaze aversion is one of the characteristics of autism that is most likely to improve through training (Rapin, 1991).

14

There have been many programs developed over the years that try to assist the communication of children with autism. Some approaches focus on the acquisition and spontaneity of language (e.g. sign language), while others focus on the acquisition of an alternative communication system (e.g. facilitated communication). One common goal of communication programs for children with autism is to facilitate socialization through language or an alternative communication form (Bondy & Frost, 1994).

Picture Exchange Communication System (PECS) for Children with Autism

A fundamental goal of teaching children with autism is to improve communication. The most socially acceptable form of communication is speech. Large proportions of very young children with autism enter formal programs without speech or other behaviors that are interpreted as having communicative intent (Bondy & Frost, 1994).

One approach that has been successful in facilitating communication along with improving behavior is functional communication (Carr & Durand, 1985). Functional Communication is an intervention strategy that uses communicative behavior as a functional alternative to inappropriate behavior. The theory behind functional communication is that children learn to misbehave in situations where there is low adult attention (Carr & Durand, 1985). The first study in 1985 found that behavior is maintained through escape and attention seeking behavior. Functional communication has been used to reduce such behaviors including aggressions, tantrums (Carr & Durand, 1985), stereotypic behavior (Durand & Carr, 1991), and other communication disorders (Durand & Carr, 1991). Two studies conducted by Carr and Durand (1985 and 1991)

concluded that by giving students a functional response to obtain assistance, they would be able to use it across settings, even with those who have no special training in functional communication.

Aside from speech, another avenue for teaching functional communication skills has involved the use of alternative or augmentative communication systems (Reichle, York, & Sigafoos, 1991). These systems include sign language, either alone or in combination with speech; electronic communication devices; or "low-tech" communication systems that use either abstract symbols or pictures with varying degrees of symbol representation.

A recent approach to facilitating language development and functional communication in children with autism is the Picture Exchange Communication System (PECS). PECS was developed by Bondy and Frost during the mid 1980s and was developed to help children and adults with autism and other developmental disabilities to rapidly acquire functional communication skills (Bondy & Frost, 1994a). The system is primarily used with individuals who either do not use speech or speak with limited effectiveness. It was originally developed for use with young children with autism, PDD, and social-communication deficits and is now used with children and adults with a wide array of communicative and developmental difficulties (Bondy & Frost, 1994a). Individuals using PECS are taught to give a picture of a desired item to a communicative partner in exchange for the item. By doing so, the individual initiates a communicative act for a concrete outcome within a social context (Bondy & Frost, 1994). PECS does not stress the use of verbal language, and does not use verbal prompting in training;

however, the goal of PECS is for the child to spontaneously initiate communicative interactions (Frost & Bondy, 1994).

One of the principle advantages of PECS is the integration of theoretical and practical perspectives from the fields of applied behavior analysis and speech/ language pathology (Bondy & Frost, 1994). Several techniques developed within applied behavior analysis are used as the fundamental teaching strategies (Bondy & Frost, 1994a). For example, to implement PECS, we must first identify powerful reinforcers for which a child will be motivated to communicate.

Teaching strategies provide a variety of prompting, shaping, and fading techniques to gradually improve and modify how children use the system. Techniques are drawn from discrete trial and sequential formats as well as incidental training formats. From a communication perspective, the system emphasizes the importance of having children learn to approach their communicative partner from the beginning of training rather than solely waiting for specific cues from the partner (Cafiero, 2001). Some of the identified advantages of PECS include 1) the exchange is clearly intentional and readily understood, 2) the child initiates the interaction, and 3) the communication is meaningful and highly motivating (Cafiero, 2001).

Unlike time delay and sign language, two forms of communication programs, PECS does not require verbal or motor imitation skills as prerequisites (Frost & Bondy, 1994). It also uses intrinsic rather that social reinforcers (Frost & Bondy, 1994).

Another important characteristic of PECS that makes it desirable is that it can be used universally. The child is able to communicate with others who have no special

training, for example, ordering at restaurants, purchasing items, and using public transportation.

PECS uses various behavioral techniques such as backward chaining, shaping, anticipatory prompting, delayed prompting, and fading of physical prompts. These techniques are found throughout the six phases of PECS training. Because PECS utilizes behavioral techniques, it is important that training remains consistent (Cafiero, 2001).

The materials used during training are picture items, communication book and/or board, and a sentence strip. The picture items vary in size and color, depending on the phase level the child is on. In the first phases of training, the pictures are larger, and as more items are added to the child's "vocabulary", the pictures become smaller. Each picture has a Velcro backing so that it can be connected to the communication book, board, and sentence strip. The communication book has pages that hold the Velcro picture items in place. The cover of the book can serve as the communication board, or a separate board can be used.

The communication book should always be accessible to the student. In the beginning stages, the book is with the child always. As the training progresses, the book is placed in an accessible part of the classroom that remains constant (e.g. desk, cubby).

PECS is an affordable program that does not require intensive training or materials. There is a computer program that assists in developing picture items that can be hand-made by a teacher. Training materials, videotapes, and workshops are readily available and well structured.

The key to successful use of PECS is in how children are taught to use pictures and other symbols to communicate rather than in merely filling the environment with

many pictures. The key to effective teaching is effective staff and parent training in the use of the system (Bondy & Frost, 1994a).

Self-Management Skills for Children with Autism

Self-management is an intervention extensively documented for its effectiveness to improve behavior (Mitchem, 2001). Self-management programs typically involve some combination of two or more of the following strategies: self-monitoring, self-evaluation, and positive reinforcement. A successful program combines the strategies to teach students responsibility for their own social behavior and academic performance, making self-management an appealing class-wide strategy to promote the inclusion of students with disabilities as well as to improve classroom behavior of all students in the classroom.

General education teachers typically resist the inclusion of students with disabilities in their classrooms because they do not feel adequately prepared to successfully address the behavioral challenges these students present (Mitchem, 2001). Given the appeal of self-management as an inclusive strategy, it is interesting to note the extremely few studies that have investigated the class-wide use of self-management programs in general education settings rather than in special education settings. Because it appears that all students need self-management skills, it is unclear why self-management has not been used more frequently on a class-wide basis (Mitchem, 2001).

Self-management is a series of procedures by which an individual monitors and alters his/her behavior. Self-management can also include providing consequences for target response. Studies have been conducted in which self-management was shown to

increase the rate of appropriate classroom behavior of typically developing children (Mirenda, 1994). Furthermore, self-management is frequently effective in changing behavior of individuals with disabilities (Mirenda, 1994). It has been used to decrease the rate of stereotypic behavior of children with autism (Koegel & Koegel, 1990). Scott & Gillian (1987) discussed that the use of self-management strengthened on-task behavior in children with developmental disabilities. Notably, self-management has been used to promote independent play for children with autism (Koegel & Koegel, 1990).

Self-management skills, otherwise known as coping skills, help the student deal with stressful situations in an appropriate, socially acceptable manner (Scott & Gillian, 1987). Stressful situations include those involving extreme positive or negative feelings, such as excitement, frustration, anger, or feelings associated with receiving negative feedback (Scott, 1987). Such feelings indicate that the child is responsive to his or her environment. It may be appropriate for autistic students to experience extreme feelings, however, it is not appropriate or desirable for them to respond to the feelings by exhibiting negative behaviors such as throwing tantrums, screaming, self-injury, or aggression. Instead, they need to be taught appropriate ways to recognize and express their feelings (Scott, 1987).

As stated earlier, a major characteristic of autism is a deficit in appropriate play and social skills. Although many studies have targeted improvement in these areas for people with mental retardation, few researchers have attempted to teach a combination of social and play skills to children with autism (Klin & Volkmar, 1992). According to Durand & Merges (1991), the use of a modeled approach to teaching social skills can be useful in the training of children with autism. This may indicate that social skills can be

20

taught as small, discrete, and operationally defined responses. An example would be to teach an adult to shake hands through a system of modeling and reinforcement in a practical and functional way (Durand & Merges, 2001).

Functional Communication and Self-Management for Children with Autism

Functional communication training specifically uses communication to reduce challenging behaviors (Durand & Carr, 1991). This strategy includes assessing the variables maintaining the behavior to be reduced. It is assumed that if individuals can gain access to desired consequences more effectively by using the new response, they will reduce their undesirable behaviors (Durand & Merges, 2001).

Visual symbols as functional, positive, behavioral supports have been applied for individuals with autism spectrum disorders. This functional communication training involves systematic instruction in the use of functionally equivalent communicative behaviors to replace inappropriate communicative behaviors (Cafiero, 2001).

In the study, the student is taught to generate a communicative message through augmented output: visual-graphic symbol (PECS) used alone or a visual-graphic symbol mounted on a voice output device (Cafiero, 2001). One strategy used in functional communication training involves teaching the student to point to a visual symbol to signify a request for assistance, a break, or a desired item or activity. In an extensive review of the literature, Mirenda (1994) found that of the eight functional communication-training studies participants with autism all demonstrated rapid, long-lasting, and significant decreases in problem behaviors.

One method that has been demonstrated to be highly effective in teaching children with autism has been the use of visual cues as a primary form of instruction and routine independence (Massey & Wheeler, 2000). Visual cues can be represented in the form of individualized activity schedules comprised of objects, photographs, pictures/symbols, and/or words. Due to the deficits of receptive and expressive language of children with autism experience, using said visuals, students learn the routine of the daily activities and require less prompting to engage in the scheduled activities (Massey & Wheeler, 2000). The pictures allow for visual input to the receptive processing. These photographic activity schedules can successfully assist young children with autism in developing self-management skills, which in turn promotes increased levels of independence (Massey & Wheeler, 2000). It appears that teaching autistic children to use PECS to increase their functional communication skills may reduce their inappropriate behaviors.

Summary

An intensive review of the literature summarized autism, the characteristics of children with autism, the Picture Exchange Communication System (PECS), different approaches in self-management, and PECS used in self-management.

Individuals with autism and severe mental retardation typically display deficits in both communicative input and output skills. Comprehension of spoken language input may be particularly challenging for individuals with autism.

A variety of strategies have been used to help children with autism acquire functional communication skills. The Picture Exchange Communication System (PECS) was developed as a means to teach children with autism and related developmental

disabilities a rapidly acquired, self-initiating, functional communication system. Its theory combines principles from applied behavior analysis and guidelines established within the field of alternative and augmentative communication. This approach has several potential advantages relative to imitation-based strategies and symbol selection strategies.

Self-management skills require an individual to understand self-reinforcement and self-monitoring of his/her behavior. It is teaching individuals to take responsibility for their social behavior, as well as, their performance in academics. It is widely used with typically developing individuals and studies have shown benefits of such skills with individuals with disabilities.

Picture Exchange Communication System has been a valuable tool in producing a functional communication for children with autism. Therefore, it can be used in developing awareness of self-monitoring and self-reinforcement skills, the key components in self-management skills. This paper will reflect the implementation of the combination of the two techniques: PECS and self-management. With limited knowledge of growth in self-management techniques of children with autism, the study of PECS and its influence on self-management may be a beneficial technique for successful behavior/classroom management.

Chapter III

Methodologies

<u>Students</u>

Two students participated in this study. These students are enrolled in the primary autistic program at a special services school district in the Northeast area of the United States of America.

The students were identified and diagnosed as autistic by the sending district according to the state administrative code (6A: 14-3.5). All students have IEP goals and objectives regarding social and behavioral skills.

Student 1 is a 10-year-old boy who has limited verbal skills. He is emerging on Phase 5 of the PECS and requires high reinforcement throughout his activities. According to the Wechsler Individual Achievement Test Screener (WIAT), his academics are considered to be K.0 level.

Student 2 is also a 10-year-old boy with some verbal communication though he requires the PECS for structure of language. He has completed Phase 5 of the PECS and requires a reinforcement system through activities. According to the Wechsler Individual Achievement Test Screener (WIAT), his academics are considered to be K.1 level.

The participating students were matched by levels according to the Wechsler Individual

Achievement Test Screener (WIAT) scores and use the Picture Exchange

Communication System (PECS) as a source of daily communication (See Table 1).

Table 1

	Student 1	Student 2
Age	10	10
WIAT grade/ scores	K.0	K.1
PECS phase	Emerging 5	5

*Note: PECS consists of 6 phases:
      Phase 1 = How to communicate
      Phase 2 = Distance and Persistence
      Phase 3 = Discrimination
      Phase 4 = Sentence Structure
      Phase 5 = Response to "What do you want?"
      Phase 6 = Commenting

Research Design

A multiple-baseline design across students was used in this study with a baseline

condition comparing with two treatment conditions. The experiment was conducted over

a three-week period and all instruction was provided in a special education, self-

contained classroom.

Instructional Materials

Materials used in this study were the Picture Exchange Communication System

(PECS), and behavioral reinforcement system (token economy).

The PECS is an alternative, functional communication system that is used with

individuals as a communication device to support communication skills. For this study, a

picture symbol of "Break" is used when communicating for a break. The card is 1"x 2" and is bright yellow with bold and black print. It is housed on the front of the students communication book that is carried with them at all times.

The behavioral reinforcement system used is a token economy where the student earns ten pennies for a preferred item. Intervals in receiving the pennies depend upon the individual student and his abilities. The average among the intervals is 2-3 minutes.

The instruction of the "Break" intervention will begin within the classroom during a single activity. When the student completes the task individually generalization throughout remainder activities will begin. The students are required to learn this self-management skill to demonstrate independence when requesting the "break" card when needed.

Procedures

A. Instructional Procedures

The instruction was implemented in the student's special education, self-contained classroom. The instruction consisted of teaching the students to request for a "BREAK" when inappropriate behaviors tended to occur by pointing to the "Break" card. When the request was presented the students were able to take a break in a designated area of the classroom for 3 minutes.

The lesson format to teach a "Break" card will follow steps using task analysis (see Figure 1). There are 2 staff members involved when first teaching the skill, and prompts were used to assist the student. As the student becomes more independent to request a Break, the prompts should be faded.

B. Observation Procedure

Table 2 describes the observation and instructional time of the procedure. Students' behaviors were observed during scheduled classroom activities (see Appendix A). During this time, tally marks will be placed to record each behavior occurrence at the affiliated time on the data sheet (see Appendix B).

Table 2

Phase		S1	S2
I	Baseline without PECS	5 days	7 days
II	Instruction with PECS and reinforcement	10 days	10 days
III	Using PECS and self-management skills	10 days	10 days

Figure 1: Task Analysis on Requesting a "Break"

Steps	Trial	Trial	Trial	Trial	Trial
1= Get Communication Book					
2= Scan through Book					
3= Get "break" card/Picture					
4= Remove card/picture					
5= Seek out/approach communicative partner					
6= Hand card/picture					
7= Go to break area					
8= Set timer					
9= Sit in break area					
10= Remain until timer signals					
11= Turn off timer					
12= Return to task					
Total Successful Steps					
% Correct					

Prompt Hierarchy:

Independent	+
Verbal Cue	V
Gestural	G
Modeled	M
Partial Physical	PP
Full physical	FP

27

Dependent Measures

A data recording sheet (see Appendix B) was used for behavior observation during baseline, Intervention I and Intervention II phases. During Phase I, impulsive behaviors were observed and recorded. During Phase II, intervention was conducted, and Phase III observation acquired data of student independence in requesting BREAK, as well as, existing impulsive behaviors. Impulsive behaviors recorded are:

a) Behavior 1 = O (out of activity or seat, wandering around during transition)
b) Behavior 2 = A (aggression towards staff, peers, or self, e.g. pushing, kicking, pinching)

The condition under which the children were observed was classroom based. Data was collected throughout activities using the recording sheets for twenty-seven days across different phases (baseline, intervention I and II).

Reliability

To ensure observation reliability, two professional staff members observed the students at the same time. A commonality criterion was prior agreed upon among the staff that when the student demonstrates 70% accuracy in requesting for a BREAK without any prompts from the staff, the students are demonstrating self-management skills.
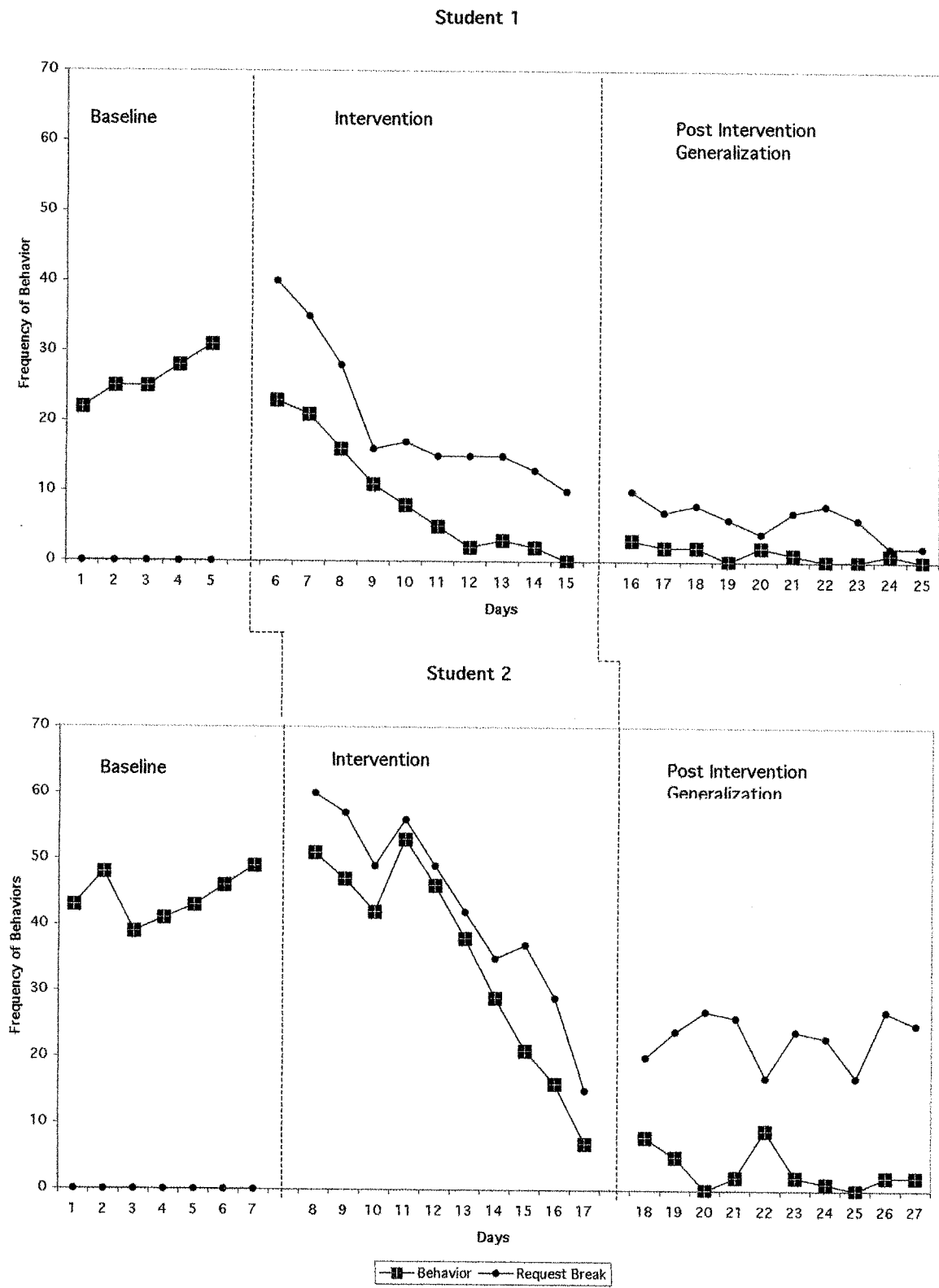
Chapter IV

Results

Data was collected to measure the impact of the Picture Exchange Communication System (PECS) on the decrease of impulsive behaviors and increase of self-management skills. The number of the behaviors and "Break" card were recorded to track the occurrences of each behavior. The data showed that the Picture Exchange Communication System (PECS) has improved behaviors for the students involved in the study. However, results can vary for each individual student with autism.

Individual graphs for each student illustrate baseline, intervention and post-intervention data. Data collected for student 1 indicates that there was a decrease of escape/avoidant behaviors and an increase of self-management skills. Data collected for student 2 indicates that there was a decrease of escape/avoidant behaviors and increase of self-management skills, though the need for the "Break" card appears at a high frequency (See Figure 2)

Figure 2

Student 1

Student 2

Behavior ━━ Request Break

30

Chapter V

Discussion

The purpose of the present study was to demonstrate the decrease of impulsive behaviors while increasing self- management skills of children with autism through the use of the Picture Exchange Communication System (PECS). The study evaluated the effects of using the Picture Exchange Communication System (PECS) to decrease avoidant / escape behaviors and examine the effects of using the PECS to increase self-management skills.

The first research question was examined regarding the positive impact of the Picture Exchange Communication System on children with autism. The Picture Exchange Communication System is an augmentative communication system revolving around functional communication. PECS was developed to help children and adults with autism acquire functional communication (Bondy & Frost, 1994a).

The second research question was examined regarding the Picture Exchange Communication System decreasing impulsive behaviors. This study found that through the use of the PECS a reduction in impulsive behaviors occurred. The students were given a form of communication, "break" card, to use when they were frustrated. This strategy was similar to the study by Carr and Durrand (1985) to give students a functional response for appropriate behaviors.

The third research question was examined in regards to the Picture Exchange Communication System and the increase of self-management skills. According to this study, the implementation of the "break" card increased the self-management skill of self-monitoring. The students demonstrated consistent growth of the skill.

It is assumed that functional communication training is used specifically to reduce challenging behaviors (Durand & Carr, 1991). If individuals gain access to desired consequences more effectively, they will reduce the undesirable behaviors (Durand & Merges, 2001). One method that has been demonstrated to be highly effective in teaching children with autism has been the use of visual cues as a primary form of instruction and routine independence (Massey & Wheeler, 2000).

Functional communication has been studied to measure its effects on children's behavior. The theory behind functional communication is that children have aversive behavior in situations where there is low adult attention. By giving children functional communication to use in typical situations, the child will be able to use language to express their needs instead of appropriate behaviors (Durand & Carr, 1991). The results of this study showed the Picture Exchange Communication System was successful in providing a functional communication to reduce inappropriate behaviors. According to the data, once the PEC was implemented impulsive behaviors began to reduce. After two weeks of intervention, both students demonstrated independence to use the Picture Exchange Communication System to request for a "Break" when needed. This skill was also generalized in follow-up sessions.

The data of this study found that student #2 not only decreased the impulsive behavior but also yet formed an obsessive behavior. It showed that the student

consistently requested for a break to avoid the current activity. Though the student demonstrated a new behavior, results imply that the Picture Exchange Communication System does impact the decrease of impulsive behaviors and increase self-management skills of children with autism.

There are some limitations to this study. First, the time period for observation and implementation was not long enough to see if success could be continued for longer duration. Second, autism is a disorder that is extremely unique among each individual it encounters. The number of students observed in this study can only predict that the Picture Exchange Communication System can have a successful outcome for all with autism. And thirdly, the students were observed in a self-contained classroom limiting evidence of the learned, self-management behavior to be demonstrated among other environments.

In conclusion, the Picture Exchange Communication System (PECS) was designed to give children with autism and other developmental disorders a way to communicate with the world around them. It is a picture based communication system utilized to initiate communication. PECS are used throughout education of children with autism, including behavior modification and self-management. Though children with autism have extreme difficulty to express their feeling appropriately, the PECS can be utilized to help them successfully communicate their needs while reducing the inappropriate behavior.

This study was conducted to measure the impact of the Picture Exchange Communication System on decreasing impulsive behaviors and increasing self-management skills. Two students were observed and the study demonstrated consistent

evidence even though the time period was limited. A recommendation to follow-up on the two students is suggested to see if the positive results are continued with generalization throughout different environments. Independent self-management skills are difficult to achieve though the Picture Exchange Communication System (PECS) is a tool used in developing self-management skills for children with autism.

REFERNCES

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

Andolsek, K.M., (1998), "Characteristics and Symptoms in Patients with Autism", *American Family Physicians*, v57, n4, p809-811

Bondy, A., & Frost, L., (1994a), The Delaware Autistic Program. In Harris, S., & Handleman, J. (Eds.). *Preschool Programs for Children with Autism* (p37-54). Austin, TX: Pro-Ed.

Bondy, A., S., and Frost, L. A., (1994), "The Picture Exchange Communication System",

Focus on Autistic Behavior, v9, n3, p1-16.

Cafiero, J., (2001), "The Effect of an Augmentative Communication Intervention on the Communication, Behavior and Academic Program of an Adolescent with Autism", *Focus on Behavior and Other Developmental Disabilities*, v16, n3, p179-189.

Carr, E. G., and Durand, V. M., (1985), "Reducing Behavior Problems through Functional Communication Training". Journal of Applied Behavior Analysis, v18, n2, p111-126.

Courchesne, E., (1997), "Neuroanatomical Systems Involved in Infantile Autism: The Implications of Cerebellar Abnormalities", in Dawson, G., (1989), <u>Autism: nature, Diagnosis, and Treatment</u>, The Guilford Press, New York.

Dawson, G., (1989), <u>Autism: nature, Diagnosis, and Treatment</u>, The Guilford Press, New York.

Durand, V. M., and Carr, E. G., (1991), "Functional Communication Training to Reduce Challenging Behavior: Maintenance and Application in New Settings", *Journal of Applied Behavioral Analysis*, v24, n2, p251-264.

Durand, V.M., and Merges, E., (2001), "Functional Communication Training: A Contemporary Behavior Analytic Intervention for Problem Behaviors", *Focus on Autism and Other Developmental Disabilities*, v16, n2, p110-119.

Frost, L.A., and Bondy, A., S., (1994), "The Picture Exchange Communication System Training Manual", Pyramid Educational Consultants, Inc.

Kanner, L., (1943), "Autistic Disturbances of Affective Contact", *Nervous Child*, v2, p217-250

Klin, A., Volkmar, F., Sparrow, S., (1992), "Autistic Social Dysfunction: Some Limitations of the Theory of Mind Hypothesis", *Journal of Child Psychology and Psychiatry*, v33, n5, p861-876.

Koegel, R. L., and Koegel, L. K., (1990), "Extended reductions in Stereotypic Behavior of Students with Autism through a Self-Management Treatment Package", *Journal of Applied behavior Analysis*, v23, p119-127.

Massey, N, and Wheeler, J., (2000), "Acquisition and Generalization of Activity Schedules and their Effects on Task Engagement in a Young Child with Autism in an Inclusive Pre-school Classroom", *Education and Training in Mental Retardation and Developmental Disabilities*, v35, n3, p326-335.

Mauk, J. E., (1993), "Autism and Pervasive Developmental Disorders", *Pediatric Clinics of North America*, v40, n3, p567-578.

Miller, H., (1996), "Eye Contact and Gaze Aversion: Implications for Persons wit

Autism" *Sensory Integration,* Special Interest Newsletter of the American Occupational

Therapy Association, Inc., v19, n2, p1-3.

Mirenda, P., & Schuler, A. (1994), "Augmenting communication for persons with

autism: Issues and strategies". In Butler, K. (Ed), Severe *Communication Disorders:*

Intervention Strategies (p33-52). Gaithersburg: MD, Aspen Publishers.

Mitchem, K. J., (2001), "Adapting Self-Management Programs for Class wide

Use", *Remedial and Special Education,* v22, n2, p75-89.

Rapin, I., (1991), "Autistic Children: Diagnosis and Clinical Features",

supplemental paper from Albert Einstein College of Medicine.

Reichle, J., York, J., & Sigafoos, J. (1991). *Implementing Augmentative and*

Alternative Communication Strategies for Learners with Severe Disabilities. Baltimore,

MD: Paul H. Brookes Publishing.

Rutter, M., (1996), "Autism Research: Prospects and Priorities", *Journal of*

Autism and Developmental Disorders, v26, n2, p257-273.

Siegel, B., (1996), The World of the Autistic Child, Oxford University Press, New

York.

Scott, B. and Gillian, J., (1987), "Curriculum as a Behavior Management Tool for

Students with Autism", *Focus on Autistic Behavior,* v2, n1, p1-8.

Williams, P., Dalrymple, N., and Neal, J., (200), "Eating Habits of Children with

Autism", *Pediatric Nursing,* v26, n3, p259-265

APPENDICES

Classroom Schedule: 2001-2002

	Monday	Tuesday	Wednesday	Thursday	Friday
8:45	Books (CW – Oral Motor	Books (CW – Oral Motor)	Books CW – Oral Motor	Books (CW – Oral Motor)	Books (CW – Oral Motor
8:55	Jobs	Jobs	Jobs	Jobs	Jobs
9:00	Art	Morning Group	Music (CW – OT)	Art	Music
9:30	Morning Group	Reading	Morning Group	Morning Group	Morning Group
10:00	Reading	Math (CW – OT)	Reading	Reading	Reading
10:30	Math	Social Studies	Math	Math	Math
11:00	Social Group	Gym (MW – OT)	Social Group	Gym	Social Group
11:30	Lunch	Lunch	Lunch	Lunch	Lunch
12:00	Video	Video	Video	Video	Video
12:30	Handwriting	Science: G2 Independent Boxes: G1	Handwriting	Science: G2 Independent Boxes: G1	Handwriting
1:00	Recess	Recess	Recess	Recess	Recess
1:30	Snack	Science: G1 Independent Boxes: G2	Snack	Science: G1 Independent Boxes: G2	Snack
2:00	Jobs	Jobs	Jobs	Jobs	Jobs
2:10	Bus	Bus	Bus	Bus	Bus

Group 1: JW, KS, AP, KA.   Group 2: JF, CW, KL, MW

Appendix A

Student: _____   Week of: _____
School: _____
Behavior: _____
_____

	Monday Date:	Tuesday Date:	Wednesday Date:	Thursday Date:	Friday Date:	
8:45						
9:00						
9:15						
9:30						
9:45						
10:00						
10:15						
10:30						
10:45						
11:00						
11:15						
11:30						
11:45						
12:00						
12:15						
12:30						
12:45						
1:00						
1:15						
1:30						
1:45						
2:00						
Total						