2002

Teaching a child with autism to use an independent activity schedule to increase play behavior and reduce stereotypy

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TEACHING A CHILD WITH AUTISM TO USE AN INDEPENDENT ACTIVITY SCHEDULE TO INCREASE PLAY BEHAVIOR AND REDUCE STEREOTYPY

A Thesis

Presented to the

Faculty of

California State University,

San Bernardino

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

in

Psychology:

Life-Span Development

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ABSTRACT

The purpose of this study was to teach play skills to a six year-old deaf male child with autism and to determine if these play skills would reduce self-stimulatory behaviors. The child was introduced to an independent play schedule during two teaching phases using prompting and reinforcement procedures that have in the past been successful in teaching new skills to children with autism. Assessment phases were done in-between the teaching phases and as follow-ups to assess the child's acquisition of the play behaviors and his ability to follow the sequence provided by the schedule. During all of these assessments, as well as in the initial baseline, data was recorded for the child's play behaviors as well as his behaviors relating to eye contact, attention and self-stimulatory behaviors. These were coded on a coding sheet using a time-series analysis by trained observers. Although the child was not able to successfully learn to complete the independent play schedule without error, the progress made is encouraging and suggests that with additional teaching sessions this may be a skill that can be acquired. Over the course of the phases, the child's overall play behaviors did increase as well as the time increments he was able to sustain play with each activity.

The instances of self-stimulatory behaviors also decreased over the course of the study. These findings suggest that this technique may be successful in teaching children with autism to complete skills independently. The procedure will be implemented in the participant's home therapy program to maintain and increase his skill level.

ACKNOWLEDGMENTS

I would like to thank Dr. Laura Kamptner, Ph.D. for her help in completing this thesis project and for her patience and support in an advisee who never lived within 60 miles of the campus. I would also like to thank Dr. Fred Newton, Ph.D. and Dr. Eugene Wong, Ph.D. for being willing to communicate over e-mail, faxes and Fed-Ex and accepting to take all of this on without meeting me in person. Lastly, I would like to thank Audrey and Baker for letting me into their home to work with their child, and Marshall for being such a trooper throughout the process.

DEDICATION

To Ethan, for making me want to understand better

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CHAPTER ONE

INTRODUCTION

Children with autism exhibit a wide variety of peculiar and splintered skills. Many are highly intelligent and develop language while others carrying the same diagnosis test as severely developmentally disabled or mentally retarded, and are nonverbal. Although there are large disparities in the academic abilities of children with autism, one thing that remains fairly constant among these individuals is severely impoverished play skills. This not only puts these children at a disadvantage in developing both cognitively and socially, it also further isolates these children from their peers and peer culture. The purpose of this study is to utilize a combination of techniques including TEACCH (Treatment and Education of Autistic and related Communication-Handicapped Children) and applied behavior analysis to teach a child with autism who displays virtually no spontaneous play to complete some simple structured play activities using a play activity schedule.

Diagnosis of Autism

Autism is a pervasive developmental disorder (i.e., a severe and pervasive impairment in the development of

reciprocal social interaction or verbal and nonverbal communication skills, or when stereotyped behavior, interests, and activities are present) according to the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychological Association, 1994). It is diagnosed solely through behavioral observation. The symptoms the autistic individual exhibit may include, in varying degrees, abnormal physical, social, and cognitive development (particularly where language is concerned); hyper- or hypo-sensitivity to sensations such as touch, taste, hearing, or smell; an absence of or delay in speech and language; and inappropriate ways of relating to people, objects, and events (Gerlach, 1995). The diagnosed autistic child may exhibit many of these behaviors or merely a few. The diagnostic criteria for autism includes the onset of symptoms prior to 30 months of age, a pervasive lack of responsiveness, language deficits including peculiar speech, bizarre responses to various aspects of the environment, and the absence of any indication of a schizophrenic disturbance. Autism is more prevalent in boys than in girls (a four to one ratio), it appears in all races, religions, and social classes, and it affects approximately 1 in 1000 births (American Psychological Association, 1994).

Many autistic children are not physically identifiable as handicapped, which further confuses those who try and fail to make communicative or social interactions with these individuals. Due to their "normal" appearance, many fail to identify the diagnosis of autism and first diagnose these children as stubborn, mentally retarded, deaf, or slow to develop (Gerlach, 1995).

Theories of Autism

Autism is a disability, which typically occurs during the first three years of life. First identified by Leo Kanner in 1943, it is a mystery to professionals in terms of its cause as well as its most appropriate treatment. This only adds to the frustration of families who have autistic children. Although the etiology for the disorder is still unknown, there are several current theories regarding autism and its increasing occurrence. The most widely known of these include the psychogenic theory and the biogenic theory.

Psychogenic Theory

The psychogenic theory of autism states that the disturbance of thought or affect is within the family; for instance, in the interactions between the parents and child (Kozloff, 1993). Goldfarb (1955) referred to this

notion as "maternal deprivation". Eisenberg and Kanner (1956) described the symptoms of autism as a reaction to parental treatment: i.e., the child is merely responding to the cold, obsessive mechanical treatment he or she receives from the parents. Hayley (1959) explained a paradigm referred to as the "double bind" which is related to familial communication patterns. The child receives incongruent messages because the roles are either too rigid or too ambiguous for the child to clearly understand. The child is therefore unable to develop a coherent conception of himself and the world. Mischler and Waxler (1970) described a similar notion where family communication is disjointed which impairs the ability of the child to communicate socially and cognitively with the world around them.

The most popular psychogenic theory of autism, however, is that posed by Bruno Bettelheim. Bettelheim (1967) defined autism as "a disturbance of the ability to reach out to the world" (p.4). He felt that these children lacked self-confidence and do not feel as if they are active participants in their environment. The child then rejects the world and withdraws. He or she is described by Bettelheim as having "no self" (p.13). Bettleheim is also known for having coined the expression "refrigerator

mothers" to describe the lack of affection given by these mothers which in turn creates the autistic symptoms in the child. The treatment suggested for these children was therapy where the autistic child had positive experiences with others. It was thought to be necessary that the child realizes his actions have an influence on the environment in order for any progress to be made.

There is little evidence supporting any of the psychogenic theories. Along with the lack of evidence is the misfortune that many parents are unfairly blamed for their child's disability only further adding to their grief. These ideas are currently dismissed by nearly all professionals working with individuals with autism.

Biogenic Theory

The biogenic theory is a biologically-based model of autism that holds that individuals with autism have one or several abnormalities in the brain which are caused by biological factors including genetics, medical complications during pregnancy or birth, or viral infections. The evidence for a genetic or physiological "cause" is supported by the following facts: the disorder is observed very early in life; there is a consistent ratio of three to four boys to one girl; the autism "syndrome" is closely simulated in brain-damaged children;

there are no "gradations" of autism, and the syndrome is highly unique and specific. It should be noted however, that the possibility of autism having a genetic factor does not rule out the possibilities of environmental effects (Rimland, 1964).

Of the many biogenic theories, several focus on the structure and functioning of the central nervous system. Ornitz and Ritvo (1969) claimed that symptoms of autism can be viewed as manifestations of "perceptual inconstancy", where identical percepts from the environment are not experienced as the same each time. This would trace the disorder to an underlying failure of homeostatic regulation within the central nervous system. Rimland (1964) supported the theory of "cognitive dysfunction". He argues that the basis of autism lies in the child's impaired ability to relate new stimuli to remembered experience. He believed the "cause" of the dysfunction was an impairment in the brain's reticular formation, which is believed to be the part of the brain which links sensory input and prior content. Although the exact reason for the occurrence of the dysfunction is unknown, it was speculated by Rimland to be possibly a consequence of excess oxygen given to the child in infancy. This is only speculation, however, and it does

not appear to be relevant in all cases of children with autism.

There are also biogenic theories that claim autism is a result of biochemical and or metabolic abnormalities. Goodwin (1971) found abnormal responses in children's TCDC (Transcephalic Direct Current) system to gliadin and variations in cortisol levels suggesting a correlation between autism and malabsorption and sensitivities to food. This has led many parents to attempt altering the diet of their child to see if in fact it produces changes in their behavior or learning of language. There is no research to date supporting this idea, although it is a common treatment parents try in search of an attempt to lessen the impacts of this impairing developmental disability.

Lastly, many physiological theories suggest autism is not the direct result of a specific biochemical imbalance or neurological defect, but rather is a secondary reaction to such defects. Bender (1960) viewed autism not as an inborn impairment of the nervous system, but as a defensive reaction to one. The child withdraws to protect himself or herself from the anxiety and disorganization arising from the more basic genetic or structural pathology. Goldstein (1959) referred to the autistic

disorder as a defense against the child's inability to engage in abstract thinking. This too was seen as a protective mechanism for the child.

Current research focuses on genetics as well as tracking brain abnormalities using the newest technologies. Twin studies by Dr. Edward Ritvo suggest that autism may not be purely genetic but may require a disease-born or chemical trauma to a developing fetus as a precipitating factor (Hart, 1993).

The many factors associated with causing autism as well as the wide spectrum autism covers lends support to the "final common pathway" theory. This suggests that there are many "causes" of autism, but that they all share the common characteristic of damaging areas of the brain that are responsible for the development of normal communication, social functioning, and play (Baron-Cohen & Bolton, 1993). This also helps explain why some children appear to be born with infantile autism whereas others appear to develop normally and then suddenly show symptoms later in their childhood.

Currently, there are several theories being simultaneously studied throughout the world to explain a possible biological or neurological etiology for autism (e.g. childhood vaccinations, neurological abnormalities,

environmental allergies or toxins, or possibly medications administered at the time of delivery). Most of these are generated by suspicions that parents have. Many children are being currently injected with secretin, a hormone derived from pigs, because a parent claimed her son's autistic symptoms decreased greatly after having been given secretin during another medical procedure. Research is also being done on the measels/mumps/rubella vaccination as many parent's claim their child began their regression into autism immediately after this injection was given. There are also studies being done which involve the injection of gamma-globulin into autistic children. Biogenic research is very difficult, however, due to the fact that many of these studies may have possibly dangerous side effects, and require large amounts of subjects. Although autism is increasing in its incidence, it is still a relatively rare disorder. It must also be taken into account that there are many differences in symptoms autistic individuals exhibit, which may indicate different etiologies of the disorder. The development of a more accurate brain imaging scan as well as future studies done on the brains of deceased individuals with autism may give researchers a greater understanding of what causes autism. In the meantime, however, families are left to

discover the most effective treatments possible to decrease the adverse effects autism has on learning and behavior (Shaw, 1998).

Treatments and Interventions

There are many different interventions and treatments used with autistic children. These range from biochemical to educational. Most families who have a child with autism will try a number of different treatments and interventions. None have yet been found to be statistically proven to "cure" children of autism. However, most claim to be effective for at least some children some of the time. Parents need to be resourceful in finding effective treatments to help their children, yet be aware that autism is a multi-faceted disorder and often several approaches are necessary to achieve optimum results. Also, every case must be individualized to suit the child in question. With that said, a brief summary of some of the treatments available is given Gerlach (1995). These include but are not limited to: vitamin and mineral therapy (where high doses of vitamins such as B6, B15 and magnesium are given to normalize body metabolism and improve behavior), treatment with psychotropic medications (which can include anti-depressants, anti-psychotics,

anticonvulsants, anti-anxiety medications, anti-mania medications, beta blockers, opiate blockers, sedatives, and stimulants) dietary interventions (to identify and eliminate food allergens which may be adversely effecting the autistic individual's behavior, anti-yeast therapy (supported by those who link the fungal disorder Candida to autism) , auditory integration training (which attempts to correct hyper or hypo-sensitivities to sound by retraining the auditory organs to respond correctly to various sound tones and frequencies), music therapy (which claims to help the individual by it's structure, use of a non-verbal medium, and it's ability to facilitate play and socialization, the Doman / Delacato method (which attempts to stimulate stagnant areas of the brain through physical movement of the body), osteopathy and craniosacral therapy (a light touch therapy meant to manipulate the bones of the cranium), sensory integration therapy (often facilitated by trained occupational therapists who help those individuals who exhibit an over-sensitivity or an under-reaction to touch, sound, taste, sight, or movement, are hyperactive or hypoactive in their movement, have poor self-concept, exhibit behavior problems, coordination problems, speech problems, or show difficulty in fine or gross motor skills) , holding therapy (which claims to be

able to rebuild the fragile bond the autistic child has with the outside world and with those individuals closest to them), the utilization of a device to calm the senses known as the "squeeze machine" (which was developed by an individual with autism and claims the device helps her to deal with tactile defensiveness), the Son-Rise program (which encourages the therapist or parent to follow the child's lead by engaging in similar stereotyped behaviors to enter the autistic child's world and slowly draw them out of their world), behavior therapies (including behavior management, behavior modification, and strategies using applied behavior analysis), social skills training (which teaches social scripting and facilitates social interactions with the child's peers), psychotherapy, speech and language therapy, daily life therapy (where group teaching is utilized to integrate autistic children with non-handicapped peers and rigorous physical activity and the arts are emphasized), and facilitated communication (which enables individuals to communicate via a keyboard or picture board with the assistance of hand-over-hand support from the facilitator), as well as techniques commonly found in "autistic classrooms" which often include the use of pictures to visually cue the children regarding the activities they will participate

in(Gerlach, 1995). Another treatment that has recently become popular among parents of children with autism is the technique commonly called "floor-time".

Floor Time

"Floor time" is a relatively new technique used in the treatment of children with autism. Its popularity has recently increased, most likely due to it being a particularly child-friendly approach. The founder of floor time is renowned child psychiatrist and developmental specialist Stanley Greenspan, M.D. Unlike many techniques used with children with autism, floor time follows the lead of the child. The goals of floor time, according to Greenspan and Wieder (1998), are to encourage attention and intimacy, establish two-way communication between the child and the floor time facilitator, encourage the expression and use of feelings and ideas, help the child gain logical understanding and thoughts about the outside world and build meaningful relationships with those in that world. Floor time can be facilitated by parents, speech therapists, occupational therapists, physical therapists, educators, and or psychotherapists. There have yet to be any studies done regarding the effectiveness of this treatment; however, its parent- and child-friendly nature has attracted many interested parents and

educators, and it is becoming well known and practiced throughout the country and the rest of the world both alone and in conjunction with other therapies and treatments.

Many of these interventions are used in conjunction with a form of educational treatment. Parents also often use many treatments simultaneously although this is discouraged by professionals who advocate using a single treatment at a time to be able to chart its effectiveness. Children with autism have specific learning needs, which are most often not met within the realm of a "typical" classroom setting. The two most well known fields from which most curricula for children with autism are taken from is that of the well known classroom based program TEACCH and that of the more individualized behavioral learning model.

Treatment and Education of Autistic and Related Communication-Handicapped Children

TEACCH is a program developed by Dr. Eric Schopler and his colleagues out of the Department of Psychiatry at the University of North Carolina at Chapel Hill in 1972 and stands for the Treatment and Education of Autistic and related Communication-Handicapped Children. The treatment is based on both language- and behavior-focused

intervention programs, as well as school and agency consultations. The programs are drawn up for each individual child or adult participating in the program. TEACCH programs also encourage parent involvement through parent training, education, counseling, and the development of support groups. TEACCH is also one of the only interventions that will assist autistic individuals across all age groups (Baron-Cohen & Bolton, 1993).

The primary educational goal of TEACCH is to increase the student's skill levels in areas where the individual is most successful. The concept of "recovery" is not a term used in this system. TEACCH programs seek to improve an individual's skills within a structured educational environment. This includes modification of the home or classroom to best accommodate the needs of the child with autism. Rather than the child changing to meet the expectations of a typical environment, the environment is changed to accommodate the symptomatic difficulties expressed by people diagnosed with autism. One large component of the TEACCH program is the utilization of visual aids and or cues. It is believed that these aid the individual with autism in better understanding of schedules, transitions, and expectations placed upon them. Everything within the TEACCH environment has clear

specific boundaries to maximize independent functioning and capitalize on the autistic individual's affinity for routinized behaviors. Spontaneous functional communication serves as the language goal for TEACCH students, and often alternative forms of communication are utilized to assist the children for whom vocalized speech is difficult. These can include pictures which represent objects or events, manual signs, and written words. These alternatives are used to reduce the frustration these students experience in their attempts to communicate simple functional requests or needs. The most well-known picture communication system is PECS, which stands for the Picture Exchange Communication System. It was developed by Andrew Bondy in 1994 for use in the Delaware Autistic Program. PECS is a language training system that is used as a bridge to speech for children with autism who have good visual skills but difficulty processing and producing speech and language. In using PECS, the child is taught to request desired items and activities by handing the adult a card with the picture of the item or activity on it. When the child initiates or is prompted to initiate this action, he or she is immediately rewarded by being given that item or allowed to engage in that activity. By giving children a manual means of communication Bondy found a

decrease in tantrums, aggression, and self-injurious behaviors (Bondy & Frost, 1994). PECS is most often associated with TEACCH methodology although components are often used in other programs to facilitate language or in the context of a picture or activity schedule.

Another technique commonly used in TEACCH programs is the use of activity schedules. Activity schedules are sets of pictures or words that cue the student to engage in a sequence of activities. Through graduated guidance, children are taught to open their schedule books, turn to the first page

Although TEACCH programs are highly individualized, group instruction is the format by which the program is implemented. This makes these programs desirable for school settings. Nearly all special education classrooms that are set up to teach children with autism use a TEACCH model. TEACCH strategies are also what is most often used to help autistic children mainstream to a "typical" classroom environment.

While there are very few studies that examine the effectiveness of TEACCH, some research does exist. A study conducted by Lord and Schopler (1994) reports a substantial increases in IQ among children first evaluated at ages three or four after eighteen months in a

structured TEACCH program. However, most of these children still had IQs in the range considered to indicate mental retardation, and it is feared that the increases may reflect the differences in the tests themselves as well as changes made by the children. Several anecdotal outcome measures exist which claim to support the TEACCH system. One is a survey conducted in the late 1970s, which showed that most families were very satisfied with the services provided to their children. Another is a comment made by the director and founder of TEACCH at the 1995 conference of the Autism Society of America. When asked how many children treated in TEACCH "recovered", Dr. Schopler responded, "We have some children who have become dissociated with the label of autism as well as some others who have gone on to college" (Cohen, 1998). The lack of substantial research and outcome data make many savvy parents continue their search for treatments and interventions for autism that are more substantiated by specific data and published research studies.

Behavior Modification

The only true research-based treatment for autism is Applied Behavior Analysis (ABA). This is often referred to as behavioral intervention or behavior modification. Intensive behavioral intervention can be helpful to

children having any of the disabilities under the broad heading of Pervasive Developmental Disorders (PDD) according to the criteria of the American Psychiatric Association in their *Diagnostic and Statistical Manual* (APA, 1994).

Discrete Trial Intervention (DTI) is one of many instructional techniques used in Applied Behavior Analysis. DTI provides very clear instructions and consequences for behaviors being taught to the child. These instructions are broken down into very simple components in order to maximize the likelihood that the child will be able to respond. Prompts, which systematically guide the child to give the correct response, are given to varying degrees depending on the needs of the child and are then systematically faded until the child is able to respond independently to the command. The child is reinforced after each correct response. The instructor keeps data on correct versus incorrect or prompted responses and this is what is used to determine when the child is able to proceed within the program. A wide range of skills can be taught using this technique including self-help skills, complex social skills needed to interact with others, and speech, language, and academic readiness skills. Applied Behavior Analysis can

also be used to help children with autism learn to control disruptive behaviors such as tantrums, noncompliance, and stereotyped behaviors. It is important to note that although many children have and continue to benefit from the techniques used in Applied Behavior Analysis, the degree of change varies from individual to individual. Programs are tailored to meet each child's individual needs; however, progress from child to child may vary from substantial gains to some only achieving minimal gains (Harris & Weiss, 1998).

The most important study of Applied Behavior Analysis employed with young children with autism was conducted by Dr. Ivar Lovaas (1987). This study included 38 children with autism. These children were divided into two groups. One group, named the "Intensive-Experimental Group", received at least 40 hours a week of one-to-one treatment for at least two years. The other group of children, the "Minimal-Treatment Control Group", had no more than 10 hours per week of one-to-one instruction during the two-year period. Lovaas found that 47% of the children in the intensive treatment condition were functioning at a normal level intellectually and were placed in regular education classes when re-evaluated at ages 6 and 7. Only one child in the minimal treatment group made enough gains

to place him at an equal level of intellectual functioning. These results support the success of intensive teaching using Applied Behavior Analysis, especially when the child is able to receive sufficient hours of therapy.

An important component of nearly all children's DTI curriculum involves social and play skills. Children with autism display varying degrees of social and play skills. In an ABA program, children are first taught early social skills such as looking at themselves in the mirror and playing peek-a-boo. This basic awareness of self and others branches out into the skills the child will need for solo play, play with an adult, and play with another child or a small group. Skills important to the school environment such as sitting in a circle, following group directions, and learning to assert oneself in an appropriate fashion can also be taught using these methodologies and incorporated into the child's individualized program (Harris & Weiss, 1998).

Play

One of the most integral pieces of a typical child's development is the child's ability to play. Play facilitates language, social interactions with parents and

peers, and helps connect the child to the outside world while simultaneously preparing them for the adult world they will eventually enter. Through play, children learn about the world around them. While playing, children test ideas, ask questions, and come up with answers (Schwartz & Miller, 1996). Playing with toys alone or with a caregiver or peer can help children develop emotionally, physically, socially, and cognitively. Although play is critical to the healthy development of children in so many ways, it is unfortunately also a luxury. Children do not all have equal opportunities for playing. Some children are absolved from play due to social factors such as those so impoverished they must work at young ages. Others, as we will discuss later, are impoverished cognitively or emotionally and have a reduced capacity in their abilities to engage in play (Beyer & Gammeltoft, 1998). Play is so integral that there are organizations such as the National Association for the Education of Young Children (NAEYC) and the International Association for the Child's Right to Play (IPA) that are committed to the preservation of play for children of all ages. The United Nations even states in Principle Seven that "The child shall have full opportunity for play and recreation, which should be directed to the same purpose as education: society and

public authorities shall endeavor to promote the employment of this right" (1948). Play is commonly taken for granted. However, for children with autism, play is generally impaired at best but more often than not, absent from their development (Wolfberg, 1999).

Characteristics of Play

The play of typically developing children has many features and characteristics. Beyer and Gammeltoft (1998) have complied the following list of patterns of play. Children play regardless of cultural nationality, and they play solely for play's sake; thus, the activity is an end in itself and not intended to produce anything as opposed to carrying out a task. Play supports the child's social understanding, i.e., the roles and themes, which are acted out develop the child's insight into social rules and conventions. Play stems from the child's personal perception of reality, and it is a creative activity in that the child expresses and becomes more aware of himself through interaction with the world around him or her. Children mirror each other during play, which allows and facilitates perspective-taking. Play is a platform for imagination and fantasy where the child juggles with reality by pretending that certain events can actually happen. Play also provides the child with an opportunity

to step back and view a situation from the outside. Lastly, play is based on voluntary activity and pleasure, and is the child's unique way of expressing himself or herself (Beyer & Gammeltoft, 1998).

Rubin, Fein, and Vanderburg (1983) stated that before any activity could be defined as play, it must contain five essential characteristics. First, play must be intrinsically motivated. Second, play must be freely chosen by the participants. If the activity is forced or at all pressured, it cannot be regarded as play. Third, it must be pleasurable. Fourth, play is non-literal. There must be some distortion of reality. Finally, play is actively engaged in by the player. The child cannot be passive or indifferent but must be involved physically, psychologically, or both. An accumulation of these characteristics are the closest running "definition" that can be found given to what is considered play.

Theories of Play

The first intellectual theory on play was proposed by Karl Groos (1901) who proposed that play was used to help the individual develop skills and intellectual knowledge that one would need to function as an adult.

The psychoanalytic theories of play are primarily discussed by Sigmund, Anna Freud, and Erik Erikson. These

contemporary theories see play as a means for reducing anxiety by empowering the child with a sense of control over the world around them. It also gives them a forum and an acceptable means to express any forbidden impulses the child may have.

The most popular theories of play are those that are considered cognitive-developmental, e.g., Jean Piaget's (1962). These theories, and also those by Jerome Bruner (1972) and Brian Sutton-Smith (1967), regard play as an important tool in the facilitation of intellectual growth. Piaget described the importance of play in consolidating learning that has already occurred and allowing the child to learn new material in a relaxed atmosphere. He believed play was crucial to cognitive development, and had a specific role in a child's development.

Another theory is the theory of the renewal of energy by Berlyne (1969). He describes a theory of arousal modulation in which the purpose of play is to keep the body at an optimal state of arousal, relieve boredom, and reduce anxiety and uncertainty.

Lastly, Vygotsky's contextual theory gives children an opportunity to reconstruct realities without the restraints of situational influences. He sees the social context as a major function of a child's play and

development and believes that the child's play cannot be examined without consideration of the other variables taking place that influence those actions (Hughes, 1999).

Developmental Stages of Play in Children

The evolution of play in the young child begins with exploratory play. This is followed by sensorimotor play and object play, which then leads to pretend play and eventually social play where the child is incorporating his or her play skills with the social skills needed to interact successfully with their peers.

Hughes and Hutt (1979) describe exploration as a precursor to what is considered to be play. Exploration differs from play in a few domains. These are described in terms of the child's affective state, the amount of stereotypy in his or her behavior, and the focus of the child's attention. When children are exploring, their affective state remains neutral or mildly negative, whereas in play, the children are generally joyful. There is much more stereotypical behavior seen in exploration than in play. The mannerisms are more ritualistic than in play where there is little or no rigidity. Lastly, when children explore they give their undivided attention to the task at hand. The object they're attending to dominates their attention. It has even been noted that

while engaging in exploratory behavior, children's heartbeats remain relatively constant whereas in play, the rates are much more variable. It has been found that the complexity of exploration is dependent on the child's familiarity with the place, situation, and people involved. Even when children have developed more high level play skills, when unsure of their surroundings they often will first engage in exploration before they feel comfortable playing.

Sensorimotor play is the second most complex form of play the young child engages in. Sensorimotor play is also described as "explorative" in nature. Simply put, it relates to the child relating to one specific thing at a time in a specific manner, such as rolling, throwing, turning, spinning, or sucking. It consists of the repetition of these already assimilated sensory or motor activities that are done for the sheer pleasure in doing so. Sensorimotor play occurs simultaneously with the child's early joint attention, where he or she is able to relate to one adult at a time in a social interaction (Beyer & Gammeltoft, 1998).

The terminology for sensorimotor play comes directly from the cognitive theory of Jean Piaget. This play was also referred to as "practice play" and is said to

dominate play in the child's first year of life. It progresses in stages throughout the first eighteen months of life and contributes to the intellectual development of the child. It then gives way to more sophisticated play.

Hughes (1999) describes the substages of sensorimotor play and development and the developmental transitions that occur within these substages. Piaget believed these stages correlated closely with the age of the child and therefore the substages are divided by the age of the child in months. The first stage, birth to one month, is said to be mainly a time where reflexes dominate activity for the infant. Stage two, one to four months, Piaget called primary circular reactions. These are individual action sequences that are just beginning to be coordinated by the child. The third stage takes place from four to eight months where secondary circular reactions happen. These are repetitious activities that involve an effect on the world around them. Often these involve objects rather than just the infant's own body. The fourth stage, during the eighth to twelfth months of the child's life involves goal directed activity, where a child does something to achieve a certain outcome. In the fifth stage (twelve to eighteen months), tertiary circular reactions occur where the child is varying the action sequences to make them

more interesting or exciting. Lastly, in the sixth stage where the child is at least eighteen months old, symbolization occurs and the child is ready to perform more sophisticated types of play such as pretend or make-believe.

After sensorimotor play is achieved, children begin to play with objects. Play with objects cannot occur until some basic motor skills are achieved. For this reason, object play does not occur during the first three months of life. Toys may be looked at or heard; however, manipulation without a basic grasp is not possible for the infant. The next three months of life is also not a time when the child makes advances in object play. A primitive grasp is achieved which allows the baby to feel, squeeze and mouth objects. Eye-hand coordination is improved during this time as well; however, real interest in playing with objects does not generally occur until at least the fifth month of life.

Great gains in object play occur between the ages of six months to one year. Children are now mobile and are able to pick up objects using only their thumb and forefinger. It is between the sixth and ninth month that organizing play occurs (Beyer & Gammeltoft, 1998). This is where toys are organized and no attention is paid to the

exact purpose of the items. This is also when imitation occurs. Beyer and Gammeltoft refer to imitation with toys as a socially oriented variation of organized play.

By the age of ten months, children will turn pages of a book rather than look at the book as an entirety of it's own. They are now using objects as they are meant to be used. This major change takes place between the ages of nine and twelve months, when the arrival of functional play occurs. They now are interested in involving another adult in their object play. This is referred to as sharing behavior and is considered one of the earliest forms of "dialogue" shown in infants. Toys are used intentionally and appropriately. However, sensory principles still dominate a lot of the child's interest, and toys that react with a visual or auditory stimulus to an action of the child are favored (Hughes, 1999).

Many changes take place in object play during the second year of life. Play becomes more sophisticated, better organized, and more complex as children's level of intellectual functioning increases (Bayley, 1969). The first change is that there is a decline in behaviors involving only one object at a time. As early as 12 to 13 months, children can begin to combine objects in play. A second change that happens during the second year of life

is that children now realize the multi-functions of play-things and are able to use most toys appropriately. They understand the purpose of objects, and playthings become more interesting to them. Rosenblatt (1977) described three types of behaviors found in infant object play that are used to distinguish appropriate and inappropriate uses of objects. These are indiscriminate behaviors, investigative behaviors, and appropriate behaviors. Indiscriminate behaviors describe how children react to all objects in the same way regardless of their individual distinguishing differences. Investigative behaviors involve the exploration of the objects specific features. Lastly, Rosenblatt identifies appropriate behaviors as those in which the child uses objects in the ways in which they are intended to be used. The third change that occurs with object change during the second year of life is that there is a dramatic increase in the representational use of objects. This is characterized by the mental substitution of one object for another. This is a precursor to the vast amounts of pretend and imaginary play that the child will soon engage in. Linguistic advancements during the second year of life also contribute to the child's advanced play skills and will assist them in pretend and social play (Bayley, 1969).

Symbolic and pretend play, appear in the second year of life. Due to the nature of the study, little time will be given to the discussion of pretend play as concrete object play will be addressed in the study rather than symbolic play. The development of symbolic play follows an orderly progression with three underlying elements. Piaget (1962) refers to these elements as decentration, decontextualization and integration. Decentration is the degree to which children focus on themselves in pretend play. Decontextualization refers to the ability of one to use one object to substitute for another. Lastly, the element of integration means that children grow increasingly organized in their make-believe play and begin to follow patterns and make connections between play activities (Hughes, 1999).

Between the ages of twelve and fifteen months parallel play begins in typically developing children. In this stage, children begin to recognize other children as potential play partners. This is shown in their smiling, eye contact, and vocalizations. The next stage, from fifteen to twenty months, is when children make social exchanges while engaged in the same activity. From twenty to twenty four months, children integrate their actions in a play activity where they have a common goal. The goal is

not decided by the participants, however, but by the activity itself. Children to not engage in joint activities with child governed rules until between the ages of twenty-four and thirty months. Clear differentiation of complementary roles in play appear between thirty and thirty six months of age.

At this point, children begin the most complex form of play, the emergence of true social play. Mildred Parten (1932) describes the stages of social play in older children. Her stages begin with the solitary play of the two year old, which she refers to as the lowest form of social play. This is followed by onlooker play, also occurring around the age of two, where the child watches another child at play. Next comes parallel play (described earlier) which Parten refers to as a point of transition between the socially immature level of solitary play and the socially sophisticated level of genuine cooperation. Common among three and four-year-olds is what Parten calls associative play. Each child is involved in their own separate activities, however sharing and taking turns occur between the children. Lastly is the most advanced form of social play, cooperative play. This happens around the age of four and children express the highest level of social maturity. In cooperative play, children are engaged

in a play activity where each is assigned an individual role to achieve a common goal.

Children's play becomes increasingly complex and sophisticated throughout the preschool years (ages three to five). The three-year-old has an increased imagination which helps them with their imaginative play. Children of this age are more interested in their effects of their behaviors on the surrounding world, are better able to share and take turns, and are interested in creating things they can show to others. These developments are also important components of the enhancement of play during this time. At the age of four, children have increased physical ability. They're also more secure and self-confident. Children of this age are also more product oriented. They also show more interest in identifying with adults and doing things to get their attention, both positive and negative. Lastly, five-year-olds are beginning to think logically. They engage in socially appropriate rules in their play such as sharing, turn taking and cooperating. There is also more of a dedication to family and an appreciation for their younger and older siblings. Games with rules become popular both on the school yard and in the form of board games. This age is of particular importance in this study as the subject

participating is five years old. Hughes (1999) recommends toys from this age group that allow the child to express their skill and ability at such things as art and realistic tools. Games such as Chutes and Ladders, Candyland, and Bingo are also popular among this age group.

By the time a child is at the end of their preschool years they are competent at playing functionally and symbolically. Children are proficient with these and can vary between the two with incredible sophistication and complexity.

Autistic Children and Play

Children with autism are often described as being unable to play. This is also one of the main diagnostic criteria for autism, i.e., the lack of appropriate play skills. They use objects in inflexible, stereotypic ways causing them to miss out on experiences other children gain in the first few years of life through simple manipulation and combinations of these same objects (Beyer & Gammeltoft, 1998).

Kanner (1943) the first to give a systematic description of the autistic disorder emphasized the limited ability for play among children with autism. There

is little functional play seen among these children. (i.e., using objects appropriately in play such as putting shapes in a shape sorter, rolling a car down a ramp, feeding a baby with a bottle, etc.) and the manipulations of objects that does occur it is often described as mechanical and lacking exploration. Pretend play is rare as well, and when it does occur is often associated with themes the child is obsessed with such as a specific TV show or special interest to the child. Veering away from these topics is difficult for the child with autism as is expanding on the preferred topic. Often those who know the child well will see him or her engage in the same "play" repetitively only to find out that it is a memorized script rather than a novel play sequence.

Unlike typically developing children, we are unable to create a developmental sequence to describe the emerging or lack of emerging play skills among young children with autism. Autism occurs often very early in development, possibly at birth; however, there are also children that begin developing typically and then regress. They may exhibit regular language and play skills and then lose these skills. Some children never exhibit any typical play skills. Some children line up toys, other become obsessed with one play item or theme and may play

appropriately with that item, however may seem oblivious to how to react to other play materials (Beyer & Gammeltoft, 1998).

Wing and Gould (1977) demonstrated how only a few children diagnosed with autism were able to carry out appropriate symbolic play. Those who did played very stereotypically and were indifferent to other children's suggestions. Another group of children with various developmental disabilities (not autism) demonstrated spontaneous and varied symbolic play appropriate to their developmental age.

Beyer and Gammeltoft (1998) refer to two hypotheses that attempt to explain the lack of pretend play among children with autism. These are known as the motivational hypothesis and the competence hypothesis. The motivational hypothesis (also referred to as the conative hypothesis) states that children with autism don't make use of pretend play because of a lack of emotional involvement and motivation. Simply put, they may not want to engage in symbolic play to the same extent that typically developing children do. This would explain why these children often show no pretend play in spontaneous or "free-play" situations but may do better in test situations where adults are there externally rewarding the behavior (this

inconsistent responding across situations is also seen in other areas with children who have autism). Gould (1986) found that children with autism displayed no spontaneous interest in reading for pleasure. However, these same children scored well on formal reading tests. Lewis and Boucher (1988) examined this phenomenon in a study with three groups of children (i.e., those with autism, typically developing children, and those with mental retardation). Children's play was examined under the following three conditions. In the spontaneous condition, various toys were set out on the floor. The children were invited to play as they wished while the researcher did some writing. In the elicited condition, children were handed toys and asked questions about what the toys could do or what the child could do with them. In the third condition, the instructed condition, children were given specific directions of what to do with the toys such as "Show me how the doll washes her hands" or "Show me how the car goes under the bridge". The researchers expected that the children with autism would engage in less symbolic play than the other two groups. However, this was not the case. There was no difference in spontaneous play among the three groups because none of the children in either of the three groups demonstrated any spontaneous

symbolic play. In the elicited conditions, again there were no group differences. All three groups were able to demonstrate equal amounts of make-believe play. This adds further support to the conative or motivational hypothesis.

The "competence hypothesis" is another hypothesis given to explain the lack of pretend play among children with autism. This relates to a cognitive origin where the children are unable to form the mental images necessary for pretend play. This is known as the competence or symbol deficit hypothesis. This refers to the autistic individual's lack of representational skills. This deficit would explain both the inability for these individuals to engage in symbolic play as well as the social impairments inherent in autism. Both social interaction and symbolic play require an ability to "impute" mental states to oneself and to other people. This ability is known as "theory of mind" (Baron-Cohen, 1997).

Typical developing children begin to acquire a theory of mind in the first few years of life in the form of joint-attention gestures, social perspective-taking, and later in the form of symbolic play. By age seven, this has almost completely matured. It is unknown whether this impairment is specific to individuals with autistic

spectrum disorder or if non-autistic individuals can exhibit such deficits in perspective taking. However, it affects individuals with autism way beyond their childhood years. Adults with autism who have no appropriate theory of mind are often left vulnerable to deception, and are unable to predict and adapt to changes in everyday life. In childhood, it is important to have these skills to be able to engage in simple symbolic play. For children to be able to represent to themselves the mental states of dolls, puppets, or other characters, they must have certain representational skills. For children with autism, this is difficult if not impossible (Baron-Cohen, 1997).

A study done by Baron-Cohen, Leslie and Frith (1985) examined the ability to represent mental states of others to oneself. Three groups of preschool children were used. One was typically developing, one was diagnosed with autism, and one was diagnosed with Down Syndrome. In the study, the children were seated at a table and shown two dolls, "Sally" and "Anne". A basket for Sally, and a box for Anne was also shown to the children. Sally placed a marble in her basket and then departed. Anne removed the marble from Sally's basket, and placed it in her box. The children were then asked three questions. "Where is the marble really" (to indicate the child's understanding of

reality), "Where was the marble at the beginning (to test the children's memory), and "Where will Sally look for her marble?" (to test if the children would acknowledge that Sally has a belief system independent of their own). In support of the symbol deficit hypothesis, all three children answered the first two questions correctly. However, while the typical and the Down's Syndrome children were able to answer the third question correctly, the children with autism were not. They responded that Sally would look for the marble in the box, failing to differentiate the doll's belief system from their own. The fact that these same children perform better in structured, externally reinforced play settings may be evidence that these individuals are capable of these skills; however, they do not demonstrate them spontaneously as other children do. It is apparent that play does not serve the same function for children with autism as it does for other children. It does not appear to come naturally or happen spontaneously. Many children with autism may not know how to play or inherently have the skills necessary to play with toys. This may be why when given play materials children with autism engage in stereotypic movements with them rather than what the objects are intended for.

Interventions to Teach Play Skills to Children with Autism

Although impoverished play skills are one of the major diagnostic criteria of autism, and theorists agree to the importance of play skill development in typical children, there is little research or literature available in the area of teaching children with autism to play. This is partially due to the relative lack of importance professionals have given play skills in the treatment and education of children with autism (Wolfberg, 1999). "Play therapy" has been generally viewed to fall under the category of psychoanalytic theory. As stated earlier, psychoanalytic theorists have had little to offer in the treatment of autism. While behaviorists have been successful in shaping behaviors and teaching academic skills to these children, they have not focused as much effort in teaching more abstract concepts such as play and complex social routines. Despite the lack of research in the area of teaching children with autism to play, several studies have attempted to teach various play skill areas to these individuals.

Stahmer (1995) was successful in teaching symbolic play to children with autism using a technique called Pivotal Response Training. It was found that the children

not only had learned to perform creative symbolic play after the training, but displayed more complexity in their play and had improved interaction skills. Primary to their findings, however, was that these skills were not inherent and did not occur spontaneously but needed to be taught to these children. Once they were taught they did occur at higher frequencies and were spontaneous and did not require adult instruction.

Koegel, Firestone, Kramme, and Dunlap (1974) demonstrated the ability to increase occurrences of spontaneous play through suppressing the instances of self-stimulatory behaviors. It was found that once the self-stimulatory behaviors were suppressed, there was indeed an increase in play, a finding that supported the ideas of Lovaas (1967) that appropriate play and self-stimulatory behaviors were incompatible responses. An area that wasn't looked at but was suggested for further research was that of whether the opposite would be true, i.e., if appropriate play skills were to increase, would a reduction in self-stimulatory behaviors then follow? This would then involve teaching the behaviors that would be incompatible with the stereotypic behaviors seen in children with autism.

The last study to be discussed that taught some basic play skills to children with autism and mental retardation was that performed by Coe, Matson, Fee, Manikam and Linarello (1990). In this study, which used systematic teaching, two children were taught to play a simple toss and catch game using a bean bag. Again, it was shown that children with autism can effectively be trained to play appropriately and again it was demonstrated that once the game had been put into their repertoire, they were more likely to spontaneously play in a similar manner at a later time.

Summary and Purpose of Study

A fair amount of effort has been made to document the deficits autistic children have in their capacity for play. There have been many observational studies documenting the characteristics of children with autism and how they interact with play materials, with adults and with their peers. It has been noted that the developmental progression of play does not follow the same sequence in these children as it does in typically-developing children. The few studies that exist which demonstrate interventions to teach play to autistic children have found that the suppression of self-stimulatory behaviors

increases the likelihood that these children may engage in spontaneous play. It has also been found that these children lack internal motivation to play, and may perform in play activities more successfully if reinforcement is delivered externally. Although there is limited research on teaching appropriate play skills to children with autism, what does exist suggests that when certain techniques are implemented, these skills can in fact be taught to this population.

Studies to date have focused on a minority of the autistic population, i.e., those children with basic language competence. Most researchers in these studies also taught play in a social setting, focusing on getting children to initiate play with other children or adults. Little has been done in terms of teaching play as an independent leisure activity using specific methodology such as TEACCH or discrete trial techniques. In fact, most treatments for children with autism focus primarily on language and academic goals, and don't focus on what the children can do to engage themselves when an interventionist isn't present. Children are often allowed to engage in self-stimulatory behavior during down time as opposed to being taught to involve themselves in playing independently.

The purpose of the current study is to attempt to teach a low-functioning child with autism who has very little expressive and receptive language to follow a picture schedule and engage himself independently in a short series of play activities. This study will use methodologies the subject is familiar with which have been used to teach him academic skills such as components of discrete-trial teaching where behaviors are reinforced systematically. In addition, TEACCH techniques where the child uses a picture schedule to guide him from one activity to the next will be used.

Children with autism, as well as young adults and adults with autism, have extreme difficulty organizing purposeful activities. With the utilization of the picture activity schedule to teach play skills, it is anticipated that the child will begin to display play initiation using these same skills. This could also be used to teach domestic and life skills to older individuals with autism by structuring the tasks and giving them tasks to be performed independently. This, in turn, would give them a sense of autonomy as well as relieving caretakers from constantly providing one-to-one direction to these individuals. The sequential teaching system may also be

used to teach other chained events such as dressing, getting ready for school, bed, etc.

It is predicted that the child participating in the current study will learn to follow the activity schedule to engage in independent play activities. After the child is taught to utilize the activity schedule, ideally the child will be successful in completing each component of the schedule including following the sequence of the play schedule, playing with the toys, putting the toys away, etc. It is also predicted that as the child learns to complete the play schedule and with increasing exposure to this schedule, the child will decrease the amount of non-directed activities he engages in such as self-stimulatory behaviors.

Once the child is successful in following the play activity schedule in the home, this could be taken into his classroom setting and incorporated into his day to give him structure during other times of the day. Ideally, the long-term goal then, would be for the child to generalize these behaviors to the school setting, or anywhere else the child may be where similar toy manipulatives are present. This would hopefully make these children more approachable by their peers and more likely to blend into a typical school setting. These children

need to be given the tools to know how to independently and, eventually, socially play to make them more approachable by children and prevent them from being further ostracized from their peer group. However, the degree to which engaging in play activities is internally reinforcing to children with autism is unknown at this point.

Given that researchers have previously demonstrated that play is incompatible with many inappropriate behaviors such as self-stimulatory behaviors, it is anticipated that the introduction of trained appropriated play will decrease the presence of inappropriate behaviors. The acquisition of the skills gained in teaching the child to use more play materials may also enable him to begin to spontaneously choose a variety of toys during his downtime. If the method is successful, it can be later used to introduce new toys, more complex play activities, as well as begin to teach the child to teach the child to participate in social activities either in home or in the school environment.

In summary, then, the first prediction is that over the series of teaching sessions, the child will learn to correctly follow the independent play schedule and complete the necessary components to sequentially play

appropriately with the toys presented. In other words, as the teaching sessions of the play schedule increase, there will be an increase in the frequency of play and schedule following behaviors (see Table 4). The second prediction is that as the child becomes more competent in completing the play schedule and as the amount of play behaviors increase, there will be a decrease in the frequency of engagement in self-stimulatory behaviors as well as a decrease in the child engaging in activities other than appropriately interacting with the materials presented. Simultaneously, there will be an increase in the child's appropriate eye contact and his ability to maintain an alert, attentive state.

CHAPTER TWO

METHOD

Participant

One seven year-old male child with relatively severe autism was used in this study. He was diagnosed with autism at the age of two years by a pediatrician in Los Angeles after an assessment in which he met the criteria for autistic disorder as specified in the Diagnostic and Statistical Manual of Mental Disorders (American Psychological Association, 1994). The participant was also profoundly deaf, diagnosed by an audiologist at the age of six months. He wore no hearing aids due to the severity of the hearing loss, as well as his tendency to remove the aids and place them in his mouth. The means of communication used by the child has been American Sign Language since his diagnosis of deafness. His parents, both hearing, are fluent signers and at home he is immersed in American Sign Language. At the time of the study the participant attended a multi-handicapped class for deaf and hard of hearing children at a public charter school in Los Angeles. As the occurrence of children with profound hearing loss also having the diagnosis of infantile autism is very low, no research has been done

regarding this specific population. However, research done on children with profound deafness who communicate using American Sign Language shows no developmental difference in play skill development from that of hearing children, except that materials selected should be more visually oriented.

Following is a brief history of the treatments this child has participated in since his diagnosis of autism. Soon after diagnosis at the age of two, the participant was enrolled in private speech therapy that mainly followed the theories of floor time therapy or a "child-centered" approach. This was done in an attempt to increase play and language initiation between the child and the adults who interacted with him. Due to the child's inattention and lack of compliance, this was unsuccessful and was discontinued after a few months. At the age of three, the child was enrolled in a public deaf and hard of hearing (DHH) classroom with a one-on-one assistant trained in applied behavior analysis. The child also received individualized occupational therapy as well as speech therapy. After two years, speech therapy was discontinued. This was due to lack of success and compliance by the child. Clinic occupational therapy was also discontinued because the child was unable to comply

with the instructor's commands and was unable to initiate the activities involved in the therapy. Currently, the child is six years old and receives forty hours of behavioral intervention per week, which he has been receiving from a private agency for the past three years. This includes attendance 3 hours a day at school with a one-on-one therapeutic aide trained in applied behavior analysis as well as several hours in the home of an individualized discrete trial program that addresses his academic needs as well as his social and self-help deficits. He receives two hours of private occupational therapy per week at school to help him organize his behaviors as well as help with his fine and gross motor skills. He also attends a gym twice a week where he has private gym therapy to help strengthen his muscles and practice gross motor skills using the equipment provided. Lastly, the child attends a once a week social skills group. This takes place at a center for children with autism. The purpose of this group is to facilitate basic social skills such as tolerance of a peer in close proximity, turn-taking, simple social games, etc. This individual was selected for this study due to complaints by the parents, teacher, and caregiver that the child had no independent play skills. The child was unable to

sustain his attention using toys or activities unless someone was hovering over him making him complete each task. Most of the child's time was spent involved in self-stimulatory behaviors or constant requests to leave the house. The following intervention was designed to address these specific needs of the child and caregivers to give him a structured means of playing and being occupied independently.

The parents of the child met with the experimenter and went over the purpose and procedure of the study. They signed both the Informed Consent Form (Appendix A) and the Videotaping Consent Form (Appendix B).

Experimental Design

The following study is a single subject, or n=1 repeated measures design. Data was taken in frequency measures using a time-series data collection procedure. The data analysis includes descriptive statistics to represent the frequencies of the behaviors measured. Increases or decreases in frequencies of the child's behaviors as well as the play behaviors were analyzed across the phases to assess the success of the implemented teaching procedure. The dependent measures being examined were the child's ability to play in a sequence and the

occurrences of specific behaviors the child engaged in or sustained from engaging in during the session. The independent variable was the teaching procedure.

Measures and Procedure

The procedure outlined below was based on the work of Sally Brockett, published in the Autism Society of America Newsletter in November 1998 and entitled "Developing Successful Play Activities for Individuals with Autism". For the current study, the program was modified slightly to accommodate the needs of the subject who is profoundly deaf. The procedure Brockett presented in her article has also been expanded in order to clearly describe the sequence of events necessary to complete the current study. These modifications were taken from the published manual on independent activity schedules by McClannahan and Krantz (1999). Following is a description of the procedure that was used in the study, which addressed teaching a six year-old deaf boy with autism to follow an independent play activity schedule. The study was conducted in six phases (which included an assessment phase, a baseline phase, an intervention or teaching phase, followed by a play assessment phase, a second

teaching phase, and a final play assessment phase) and two follow-up sessions (see Table 1).

Table 1. An Overview of the Procedure

	Phase I	Phase II	Phase III	Phase IV
Purpose	Toy Eval.	Baseline of Play and Child Bhvrs.	To Teach Play Schedule	Eval. #1 of Play and Child Bhvrs.
Prompt Level	As Needed	None	Fully Prompted	None Given
Length of Phase	No Time Limit	Two 5-Minute Sessions	5-Minute Sessions Over 10 Days	Two 5-Minute Sessions
Data Collected	None	Play and Child Bhvrs.	None	Play and Child Bhvrs.

	Phase V	Phase VI	Phase VIIa	Phase VIIb
Purpose	To Teach Play Schedule	Eval. #2 of Play and Child Bhvrs.	One Week Follow-up Session	Two Week Follow-up Session
Prompt Level	As Needed	None	None	None
Length of Phase	5-Minute Sessions Over 10 Days	Two 5-Minute Sessions	Two 5-Minute Sessions	Two 5-Minute Sessions
Data Collected	None	Play and Child Bhvrs.	Play and Child Bhvrs.	Play and Child Bhvrs.

Data Collection

Data was collected from videotapes of the second, fourth, sixth and seventh phases onto a time-series coding sheet (see Table 2). Timers were used that beeped every 15 seconds to notify data collectors to pause the videotape and record the behaviors taking place at those intervals. At each interval, data was collected regarding the child's behaviors as well as what they were doing in terms of the play items and schedule presented. The child's behaviors that were recorded included the presence of self-stimulatory behaviors, the presence of appropriate eye contact, and the maintenance of an attentive and alert state (see Table 3). The child's responses to the materials and activity schedule present were measured through coding the specific responses necessary to complete the independent activity schedule (see Table 4). These included moving toward the schedule, opening the schedule book, pointing at a picture in the schedule book, turning a page in the schedule book, approaching the toys in the bins, touching either the bin labeled #1 or touching the bin labeled #2, picking up the bin labeled #1 or picking up the bin labeled #2, putting the bin labeled #1 on the table or putting the bin labeled #2 on the table, touching the toy labeled #1 or touching the toy

Table 2. Blank Coding Sheet

SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 1	SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 11
SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 2	SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 12
SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 3	SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 13
SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 4	SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 14
SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 5	SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 15
SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 6	SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 16
SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 7	SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 17
SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 8	SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 18
SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 9	SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 19
SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 10	SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 20

Table 3. Coding for Time-Series Data Collection: Behavior Codes

Behavior Codes	Definition/Description
SS - Self-Stimulatory Behaviors	Child is engaging in stereotypical behaviors such as hand flapping, or motor movements using the upper body.
AEC -Appropriate Eye Contact	Child is gazing his eyes at the appropriate materials.
AS - Attentive/Alert State	Child is awake, alert, and appears to be cooperating with the procedure.

labeled #2, playing with the toy labeled #1 or playing with the toy labeled #2, putting away the bin labeled #1 or putting away the bin labeled #2 and other action (to code for any behavior the child was engaging in that did not contribute to his playing in the sequence or with the materials provided).

All phases and follow-up sessions were videotaped and reviewed by two trained observers. These observers had previous experience working with autistic children and were familiar with psychological research procedures. They were trained by the experimenter regarding the methods of this specific study including the use of the time-series analysis and the definitions of the behaviors to be coded. Observers were trained to use a timer to remind them every

Table 4. Coding for Time-Series Data Collection: Play Schedule Codes

Schedule/Sequence Components	Description/Definition
MTS - Move toward schedule	This is defined by the child approaching the schedule on the table.
OS - Open Schedule	Child opens the schedule book from closed position.
PAP - Point at Picture	Child points to a picture in the schedule book.
TSP - Turn Schedule Page	Child turns page of schedule book.
AT - Approach Toys	Child approaches toys or bins on shelf.
TB1 - Touch Bin One	Child touches bin #1 containing toy
TB2 - Touch Bin Two	Child touches bin #2 containing toy
PUB1 - Pick Up Bin One	Child picks up bin #1 containing toy
PUB2 - Pick Up Bin Two	Child picks up bin #2 containing toy
PBT1 - Put Bin One on Table	Child puts bin #1 containing toy on table
PBT2 - Put Bin Two on Table	Child puts bin #2 containing toy on table
TT1 - Touches Toy One	Child touches toy from bin #1
TT2 - Touches Toy Two	Child touches toy from bin #2
PWT1 - Plays with Toy One	Child plays appropriately with toy from bin #1
PWT2 - Plays with Toy Two	Child plays appropriately with toy from bin #2
PAB1 - Puts Away Bin One	Child puts away bin #1
PAB2 - Puts Away Bin Two	Child put away bin #2
OA - Other Action	Child is engaging in action that is unrelated to the schedule or activities presented.

15-seconds to pause the tape and record the required child's behaviors taking place at that moment. Once the training had taken place, the 5-minute videotape of a randomly selected session from the study was used to calculate the interrater reliability. This was calculated among all three coders and the reliabilities ranged from 90-100% for a 5-minute sample.

It should be noted that the video sample used to calculate the interrater reliability was of the same child who participated in the study. This was done to familiarize the coders with the child, and to ensure that the trained observers were consistent in how they coded this child's specific behaviors. As children with autism have such variable symptoms it was important the observers were familiar with and could recognize the child's self-stimulatory behaviors and could distinguish them from other possible behaviors.

Lastly, a videotape was made of the trained observers going through the appropriate play sequence so that they could be coded and used as a template for what behaviors would be ideal for each 15 second time sample. The samples were condensed into one template, which in some cases shows more than one possible appropriate during that coding period (see Table 5).

Table 5. Ideal Coding Sheet

SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 1	SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 11
SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 2	SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 12
SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 3	SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 13
SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 4	SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 14
SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 5	SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 15
SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 6	SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 16
SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 7	SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 17
SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 8	SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 18
SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 9	SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 19
SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 10	SS AEC AS MTS OS PAP TSP AT TB1/TB2 PUB1/PUB2 PBT1/PBT2 TT1/TT2 PWT1/PWT2 PAB1/PAB2 OA 20

Phases

Phase One included the presentation of various familiar toys to the child and the assessment of the child's skill ability with these toys. This was followed by the second phase, which was a baseline measure of the child's ability to play independently with two play items. Phase Three involved the teaching of the play schedule using a full-prompting or mass-trialing procedure. This was followed by an assessment of the child's acquisition of the taught play schedule in Phase Four. Phase Five involved another teaching phase where prompting was given to the student only as necessary. Phase Six was a final play assessment of the independent play schedule. Each phase is discussed more fully below.

Preparation for Phase One

The first phase included the assessment of various toys and play activities to determine the child's ability to work independently with the selected items. The preparation of materials for the toy assessment involved the selection of toys to be assessed by the instructor.

A box of four play activities and toys was prepared for the initial assessment of the child's ability to engage in play using these items. The toys were selected for this assessment based on information gathered from the

parents and the nanny about which items the child was able to play with given minimal assistance and prompting. All toys selected were activities that had a specific beginning and end. Only the materials necessary to complete the item were presented to reduce confusion. The toys selected for this study were: stringing 10 small beads, completing a 15 piece puzzle, putting 10 rubber bands on a Geoboard, and completing a wood patterning set by matching the right pieces on the template. For data recording purposes, the toys were coded. Toy #1 was the beads, toy #2 was the puzzle, toy #3 was the Geoboard and toy #4 was the wood patterning set.

Two plastic bins were purchased and placed on a shelf in the child's work-room. One of the four toys was placed in each of the first two bins. Each bin contained only that toy and the materials necessary to complete the activity.

Phase One

In the first phase of this study, the child was presented with each of the four toys and given the direction in sign language to "play". Each toy was presented individually to ensure that the child was successful in completing the task. There was no time limit for this phase. Prompting was given only as necessary to

keep the child on-task or remind him to correctly complete the task. Prompting was verbal or physical, depending on the needs of the child to stay on-task and complete the task. No data was collected during this phase. After the child had finished with each toy, social reinforcement was given. This included hugs, high-fives, and signing "Good job", "Nice playing", etc. After each toy had been presented and completed, the child was reinforced socially and with a preferred edible reinforcer and then given a five-minute break before the next item was presented. This was done to reduce fatigue or disinterest in the activity. It should be noted that the assessment phase began only when the child was in an alert and attentive state. This state was defined by the experimenter as the child displaying positive affect, was undistracted, and was willing to follow instructions. If at any time during the assessment phase the child changed his state and was unwilling to cooperate in working, became ill, overtired, or began to tantrum, the phase was immediately ended and was resumed when the child had returned to an alert attentive state. It should also be noted that this assessment phase was used to detect any difficulties the child had in completing the activities so that modifications could be made. Notes were also taken

regarding the time needed to complete the activities to ensure that the child could complete the activities in less than 5 minutes.

Phase Two

The second phase of the study involved taking a baseline measurement of the child's ability to play independently with two items. Two toys were presented at one time. They were displayed on bins on a shelf in the child's work-room. The child was given the instruction in sign language to "play". No other instructions or help was given during this phase. There were two five-minute baselines conducted. The first included toys #1 and #2, and the second was for toys #3 and #4. Each five-minute baseline session was followed by a five-minute break where the child was allowed to leave the work room and engage in an activity of his choice (e.g. self-stimulatory behavior, playing on a therapy ball, bouncing on the bed). Data was collected from the videotapes every 15 seconds on the child's

Preparation for Phase Three

The teaching of the independent activity schedule occurred in the third phase of the study. The preparation of materials for this intervention included taking pictures of all of the activities presented, the

preparation of the four toys to be used in the play schedule and the construction of the activity schedule book.

Pictures were taken with a 35mm camera of the play activities that were used in the activity schedule. Doubles were made of the pictures so that one could be placed in the activity schedule book and the other could be attached to the bin containing that item.

The four play activities and toys were prepared to reduce extraneous materials necessary to complete each task. Loose materials were placed in easy to open plastic bags and only the materials necessary to complete the activity were provided.

Pictures of the items in the bins identical to those that were used in the picture activity schedule were taped to the front of the bins to facilitate the child in finding the appropriate toy to play with. The bins were organized left to right, in the order in which they appeared in the picture schedule book.

A small photo album was purchased, and clear plastic sleeves were inserted into the album to protect the pictures that made up the pages of the schedule. Since only two pages were needed, the rest were removed to reduce confusion. The pictures of the activities were

placed into the album sleeves. The order of the activities to be completed changed randomly with every presentation so that the skill the child learned was the skill of sequence completion and how to follow the picture schedule, and to ensure that the child was not merely memorizing the order of the pictures and corresponding activities.

Phase Three

The following procedure was adapted from the instructions given for creating activity schedules for children with autism in the manual "Activity Schedules for Children with Autism" by McClannahan and Krantz (1999). Involved in this intervention was the teaching of the activity schedule to the child using a mass-trialing procedure. This entailed going through the entire task using full-physical prompting so that the child understood what was to be done without allowing any opportunities for error. Teaching sessions were five minutes in length, although some did not require this amount of time. The following describes the components involved in teaching the picture schedule to the student for one session. As in the earlier phase, the teaching session only began if the child was in an alert, attentive state. If at any time the child's behaviors escalated and this state was disturbed,

the session was promptly ended and resumed only after the child had returned to the alert, attentive state.

The child was led into the work room where all the materials were in place and the simple instruction "Play" was given to the student in sign language. This was the only directive given to the child's face, and was given only once. After this point, all directions were provided from behind in the form of full-physical manual prompting. This was important because excessive prompting while facing the child can lead the child to become "prompt-dependent" meaning he is unable to perform the tasks without step-by-step commands from the instructor. This would then make the independent sequence necessary for completing the activity schedule impossible. Regardless of the child's ability to complete the tasks involved, during Phase Three, full physical prompting was given in all of the sessions.

After the initial instruction had been given to the child, the instructor stepped behind the child and manually guided him to his activity schedule book, which was lying on the work-table. To do this, the instructor held the child's shoulders, and moved him toward the schedule on the table.

Then, the instructor placed his hands over the child's hands and prompted him to open to the first page of the activity schedule where the first picture of the first activity could be seen. The child was prompted to point to the picture on the first page. Then, the child was guided from behind to the first bin on the left, and manually prompted to pick up the bin and place it on the work-table.

Once the child was guided to sit down with the materials in the bin on the table, he was manually prompted to remove the materials from the bin and complete the specific play activity. Although only play activities that the child could complete independently were presented, full physical prompting was given for completion of the activity to ensure the child remained on-task and understood the full sequence of the new skill he was learning. Once the child had completed the task correctly, he was prompted to place the completed materials back into the bin.

Still from behind, the instructor guided the child back to the work-table where the activity schedule book was laying open to the first page. The child was then prompted to turn to the second page. The child again was prompted to point to the picture, and the same procedure

was carried out until the child had been prompted to complete and put away the second activity.

Once the second activity in its bin had been placed in the "finished" bin, the session ended and the child was reinforced socially and with a preferred food reinforcer. This indicated that the particular play schedule session had ended, and the child was given a five-minute break. After the break, the next blocked session began, using a different combination of the toys. This was repeated until both sessions had been completed. This procedure continued for 10 days before the assessment was taken in phase four. No data was coded for this phase.

Phase Four

Phase four involved an assessment of the child's acquisition of the skills taught in the previous teaching phase regarding playing independently in a sequence using an activity schedule. The order of the materials presented was randomly selected so that in the first 5-minute session two toys were presented and in the second, the other two toys were selected. The child was given the instruction to "play". No assistance was provided to the child as this is was an evaluation measure. Again, this phase began only when the child was in an alert, attentive state, and was discontinued if the child's negative

behaviors escalated to a point where the session could not continue. When this happened, the session was immediately terminated and resumed when the child had returned to an alert, attentive state. Coded data was collected from the videos on the child's behaviors and the ability of the child to follow the play sequence schedule.

Phase Five

In this last teaching phase, the child was expected to be independent in completing the activity schedule, however, prompting was given as needed. No data was taken during this phase. The order in which the toys were presented, and which toys were presented was randomly selected. The procedure was repeated once daily over 10 days. Again, teaching only began when child was in an alert, attentive state, and was discontinued if the child's aberrant behaviors escalated. Following each teaching session, the child was reinforced socially and with a preferred edible reinforcement.

Phase Six

Lastly, another play assessment was completed to measure the child's ability to be independent with the play schedule. The assessment began only when the child was in an alert, attentive state and was discontinued if this state changed. The sessions were five minutes in

length. The toys used and the order in which they were presented was chosen randomly. Two sessions were conducted and a five minute break was given in-between the sessions. Data was taken of the child's actions and behaviors from the videotapes every 15 seconds using the time-series data collection sheet (See Table 2).

Phase Seven: Follow-up Assessments

Follow-up sessions were conducted one and two weeks after the initial completion of the study. Data was collected from the videotapes every 15 seconds during the 5 minute sessions using coding for behaviors and the child's ability to follow the independent play schedule.

Following the final follow-up session, the experimenter met with the child's parents and went over the debriefing statement with them (Appendix C). They were informed that the studies results would be made available to them as well as to those involved in the child's therapeutic program. Based on the results of the study and in particular in the follow-up sessions, consideration was made into how this technique could be further used in the students home and school discrete trial program. Also, recommendations were made regarding additional teaching sessions and modifications to the schedule once it has

been successfully completed to keep expanding the child's play repertoire.

CHAPTER THREE

RESULTS

The behaviors under observation in the current study were coded from the videotape and tabulated. These included both the specific play behaviors (see Table 6) and the child's behaviors (see Table 7).

Table 6. Frequencies of Play Schedule Behaviors (Based on Forty 15-second Time Samplings)

	Phase II (Baseline)	Phase IV (Assessment #1)	Phase VI (Assessment #2)	Phase VIIa (Follow-up #1)	Phase VIIb (Follow-up #2)
MTS (Move Toward Schedule)	4 (10%)	0 (0%)	1 (3%)	1 (3%)	1 (3%)
OS (Open Schedule)	0 (0%)	2 (5%)	1 (3%)	2 (5%)	1 (3%)
PAP (Point at Picture)	0 (0%)	0 (0%)	0 (0%)	1 (3%)	2 (5%)
TSP (Turn Schedule Page)	0 (0%)	0 (0%)	0 (0%)	1 (3%)	1 (3%)
AT (Approach Toys)	5 (13%)	0 (0%)	0 (0%)	1 (3%)	0 (0%)
TB1 (Touch Bin 1)	0 (0%)	1 (3%)	1 (3%)	1 (3%)	1 (3%)
TB2 (Touch Bin 2)	0 (0%)	0 (0%)	1 (3%)	0 (0%)	1 (3%)
PUB1 (Pick up Bin 1)	0 (0%)	2 (5%)	1 (3%)	1 (3%)	1 (3%)
PUB2 (Pick up Bin 2)	0 (0%)	0 (0%)	0 (0%)	1 (3%)	2 (5%)
PBT1 (Put Bin 1 on Table)	0 (0%)	0 (0%)	0 (0%)	1 (3%)	1 (3%)

	Phase II (Baseline)	Phase IV (Assessment #1)	Phase VI (Assessment #2)	Phase VIIa (Follow-up #1)	Phase VIIb (Follow-up #2)
PBT2 (Put Bin 2 on Table)	0 (0%)	1 (3%)	2 (5%)	1 (3%)	0 (0%)
TT1 (Touch Toy 1)	4 (10%)	3 (8%)	4 (10%)	2 (5%)	2 (5%)
TT2 (Touch Toy 2)	1 (3%)	4 (10%)	2 (5%)	1 (3%)	1 (3%)
PWT1 (Play with Toy 1)	0 (0%)	10 (25%)	12 (30%)	13 (33%)	13 (33%)
PWT2 (Play with Toy 2)	0 (0%)	8 (20%)	10 (25%)	11 (28%)	9 (23%)
PAB1 (Put Away Bin 1)	0 (0%)	2 (5%)	2 (5%)	2 (5%)	2 (5%)
PAB2 (Put Away Bin 2)	0 (0%)	2 (5%)	1 (3%)	1 (3%)	1 (3%)
OA (Other Action)	25 (63%)	4 (10%)	0 (0%)	0 (0%)	1 (3%)

The first prediction stated that over a series of teaching sessions, the child would learn to correctly follow the independent play schedule and complete the necessary components to sequentially play appropriately with the toys presented. In other words, as the teaching sessions of the play schedule increased, there would be an increase in the frequency of play and schedule following behaviors. To test this prediction, the frequencies of the baseline session play behaviors (Phase II) were compared to the subsequent phases (Phases IV, VI and the two follow-up sessions Phases VIIa and VIIb). These were Phase

Table 7. Frequencies of Child Behaviors (Based on Forty 15-second Time Samplings)

	Phase II (Baseline)	Phase IV (Assessment #1)	Phase VI (Assessment #2)	Phase VIIa (Follow-up #1)	Phase VIIb (Follow-up #2)
SS (Self-Stimulatory Behaviors)	34 (85%)	8 (20%)	5 (13%)	3 (8%)	5 (13%)
AEC (Appropriate Eye Contact)	6 (15%)	2 (5%)	0 (0%)	0 (0%)	1 (3%)
AS (Attentive State)	0 (0%)	30 (75%)	35 (88%)	37 (93%)	34 (85%)

II to Phase IV, Phase II to Phase VI, Phase II to Phase VIIa, and Phase II to Phase VIIb. Percentages were also calculated to represent the percentage of intervals the child was engaged in each play behavior.

Results show that between the baseline session (Phase II) and the first assessment (Phase IV), nine play behaviors increased (see Table 8). Playing with Toy in Bin #1 (PWT1) and Playing with Toy in Bin #2 (PWT2) were the two behaviors that increased the most. In the baseline session, the child played with both toys 0% of the intervals in which data was taken. During the first assessment, he played with the toy in the first bin 25% (10 instances) of the test intervals, and with the second toy 20% (8 instances) of the intervals. The other play

Table 8. Chi-Square Values for Play Behaviors Comparing Phase II (Baseline) to Phase IV (Assessment #1)

	Phase II Frequency	Phase IV Frequency	$\chi 2$	Sig
MTS (Move toward Schedule)	4	0	4	sig p<0.05
OS (Open Schedule)	0	2	2	ns
PAP (Point at Picture)	0	0	∅	ns
TSP (Touch Schedule Page)	0	0	∅	ns
AT (Approach Toys)	5	0	5	sig p<0.05
TB1 (Touch Bin #1)	0	1	1	ns
TB2 (Touch Bin #2)	0	0	∅	ns
PUB1 (Pick up Bin #1)	0	2	2	ns
PUB2 (Pick up Bin #2)	0	0	∅	ns
PBT1 (Put Bin #1 on Table)	0	0	∅	ns
PBT2 (Put Bin #2 on Table)	0	1	1	ns
TT1 (Touch Toy #1)	4	3	0.14	ns
TT2 (Touch Toy #2)	1	4	1.78	ns
PWT1 (Play with Toy #1)	0	10	10	sig p<0.05
PWT2 (Play with Toy #2)	0	8	8	sig p<0.05
PAB1 (Put Away Bin #1)	0	2	2	ns
PAB2 (Put Away Bin #2)	0	2	2	ns
OA (Other Actions)	25	4	15.21	sig p<0.05

behaviors that increased in frequency but less so, were Opening the Schedule (OS), Touching Bin #1 (TB1), Picking Up Bin #1 (PUB1), Putting Bin #2 on the Table (PBT2), Touching Toy in bin #2 (TT2), Putting Away Bin #1 (PAB1) and Putting Away Bin #2 (PAB2). The behaviors that decreased across these phases were Touching Toy in Bin #1

(TT1), Approaching the Toys (AT), Moving Towards the Schedule (MTS) and Other Actions (OA). Of these, the behaviors that decreased most were Moving Towards the Schedule (MTS) (which decreased from 10% to 0%, or 4 instances to 0 instances), Approaching the Toys (AT) (which decreased from 13% to 0%, or 5 instances to 0 instances) and Other Actions (OA) (which decreased from 63% to 10%, or 25 instances to 4 instances). Although Other Actions (OA) is listed as a decreased play behavior, this actually relates to the child not engaging in appropriate behaviors, suggesting a positive treatment outcome.

Ten play behaviors increased between Phase II (baseline) and Phase VI [the second assessment] (see Table 9). These were Playing with Toy in Bin #1 (PWT1), Playing with Toy in Bin #2, Opening Schedule (OS), Touching Bin #1 (TB1), Touching Bin #2 (TB2), Picking up Bin #1 (PUB1), Putting Bin #2 on the Table (PBT2), Touching Toy #2 (TT2), Putting Away Bin #1 (PAB1) and Putting Away Bin #2 (PAB2). The two that increased the most significantly were Playing with Toy in Bin #1 (PWT1) (which increased from 0 to 12 instances, or from 0% of the test intervals to 30% of the test intervals) and Playing with Toy in Bin #2 (PWT2) (which increased from 0 instances to 10 instances, or from 0% of the test intervals to 25% of the test intervals).

Table 9. Chi-Square Values for Play Behaviors Comparing Phase II (Baseline) to Phase VI (Assessment #2)

	Phase II Frequency	Phase VI Frequency	$\chi 2$	Sig
MTS (Move toward Schedule)	4	1	1.8	ns
OS (Open Schedule)	0	1	1	ns
PAP (Point at Picture)	0	0	∅	ns
TSP (Touch Schedule Page)	0	0	∅	ns
AT (Approach Toys)	5	0	5	sig p<0.05
TB1 (Touch Bin #1)	0	1	1	ns
TB2 (Touch Bin #2)	0	1	1	ns
PUB1 (Pick up Bin #1)	0	1	1	ns
PUB2 (Pick up Bin #2)	0	0	∅	ns
PBT1 (Put Bin #1 on Table)	0	0	∅	ns
PBT2 (Put Bin #2 on Table)	0	2	2	ns
TT1 (Touch Toy #1)	4	4	0	ns
TT2 (Touch Toy #2)	1	2	0.34	ns
PWT1 (Play with Toy #1)	0	12	12	sig p<0.05
PWT2 (Play with Toy #2)	0	10	10	Sig p<0.05
PAB1 (Put Away Bin #1)	0	2	2	ns
PAB2 (Put Away Bin #2)	0	1	1	ns
OA (Other Actions)	25	0	25	sig p<0.05

Decreases were seen in Approaching Toys (AT), Other Actions (OA), and Moving Toward the Schedule (MTS). Of these decreases in play behaviors, the most noteworthy was that of Other Actions (OA) which decreased from 63% of the intervals (25 instances) to 0% (0 instances). This

decrease, suggests a decrease in inappropriate behaviors suggesting a positive treatment outcome.

When comparing the baseline (Phase II) to the first follow-up session (Phase VIIa), which took place one week after the last assessment phase (Phase VI), twelve play behaviors increased (see Table 10). These were Playing

Table 10. Chi-Square Values for Play Behaviors Comparing Phase II (Baseline) to Phase VIIa (Follow-up #1)

	Phase II Frequency	Phase VIIa Frequency	$\chi 2$	Sig
MTS (Move toward Schedule)	4	1	1.8	ns
OS (Open Schedule)	0	2	2	ns
PAP (Point at Picture)	0	1	1	ns
TSP (Touch Schedule Page)	0	1	1	ns
AT (Approach Toys)	5	1	2.66	ns
TB1 (Touch Bin #1)	0	1	1	ns
TB2 (Touch Bin #2)	0	0	∅	ns
PUB1 (Pick up Bin #1)	0	1	1	ns
PUB2 (Pick up Bin #2)	0	1	1	ns
PBT1 (Put Bin #1 on Table)	0	1	1	ns
PBT2 (Put Bin #2 on Table)	0	1	1	ns
TT1 (Touch Toy #1)	4	2	0.66	ns
TT2 (Touch Toy #2)	1	1	0	ns
PWT1 (Play with Toy #1)	0	13	13	sig $p<0.05$
PWT2 (Play with Toy #2)	0	11	11	sig $p<0.05$
PAB1 (Put Away Bin #1)	0	2	2	Ns
PAB2 (Put Away Bin #2)	0	1	1	Ns
OA (Other Actions)	25	0	25	sig $p<0.05$

with Toy in Bin #1 (PWT1), Playing with Toy in Bin #2 (PWT2), Opening the Schedule (OS), Pointing at the Picture (PAP), Turning the Schedule Page (TSP), Touching Bin #1 (TB1), Picking up Bin #1 (PUB1), Picking up Bin #2 (PUB2), Putting Bin #1 on the Table (PBT1), Putting Bin #2 on the Table (PBT2), Putting Away Bin #1 (PAB1) and Putting Away Bin #2 (PAB2). Increases were found in Playing with Toy in Bin #1 (which increased from 0 to 13 instances, or from 0% of the intervals to 33% of the intervals), and Playing with Toy in Bin #2 (which increased from 0 to 11 instances, or from 0% of the intervals to 28% of the intervals). Four play behaviors decreased across these phases. These were Other Actions (OA), Moving Toward the Schedule (MTS), Approaching the Toys (AT) and Touching Toy in Bin #1 (TT1). Of these, the greatest decrease was found in Other Actions (OA) which decreased from 63% of the intervals (25 instances) to 0% of the intervals (0 instances). Again, this refers to the decrease of inappropriate behaviors and suggests a positive treatment outcome.

The final period that was assessed for play behaviors was from the baseline (Phase II) to the final follow-up session (Phase VIIb), which took place two weeks following the final assessment phase (Phase VI). Across this time

period, twelve play behaviors increased (see Table 11). These were Playing with Toy in Bin #1 (PWT1), Playing with Toy in Bin #2 (PWT2), Opening the Schedule (OS), Pointing at the Picture (PAP), Turning the Schedule Page (TSP), Touching Bin #1 (TB1), Touching Bin #2 (TB2), Picking up Bin #1 (PUB1), Picking up Bin #2 (PUB2), Putting Bin #1 on the Table (PBT1), Putting Away Bin #1 (PAB1) and Putting

Table 11. Chi-Square Values for Play Behaviors Comparing Phase II (Baseline) to Phase VIIb (Follow-up #2)

	Phase II Frequency	Phase VIIb Frequency	$\chi 2$	Sig
MTS (Move toward Schedule)	4	1	1.8	ns
OS (Open Schedule)	0	1	1	ns
PAP (Point at Picture)	0	2	2	ns
TSP (Touch Schedule Page)	0	1	1	ns
AT (Approach Toys)	1	0	1	ns
TB1 (Touch Bin #1)	0	1	1	ns
TB2 (Touch Bin #2)	0	1	1	ns
PUB1 (Pick up Bin #1)	0	1	1	ns
PUB2 (Pick up Bin #2)	0	2	2	ns
PBT1 (Put Bin #1 on Table)	0	1	1	ns
PBT2 (Put Bin #2 on Table)	0	0	Ø	ns
TT1 (Touch Toy #1)	4	2	0.67	ns
TT2 (Touch Toy #2)	1	1	1	ns
PWT1 (Play with Toy #1)	0	13	13	sig $p<0.05$
PWT2 (Play with Toy #2)	0	9	9	sig $p<0.05$
PAB1 (Put Away Bin #1)	0	2	2	ns
PAB2 (Put Away Bin #2)	0	1	1	ns
OA (Other Actions)	25	1	22.16	sig $p<0.05$

Away Bin #2(PAB2). Again, the most significant increases were found in Playing with Toy in Bin #1 (which increased from 0 instances to 13 instances, or from 0% of the intervals to 33% of the intervals), and Playing with Toy in Bin #2 (which increased from 0 instances to 9 instances, or from 0% of the intervals to 23% of the intervals). Decreases among play behaviors were seen in Other Actions (OA), Moving Toward the Schedule (MTS), Approaching the Toys (AT), and Touching Toy in Bin #1 (TT1). Of these, the greatest increase was found in Other Actions (OA), which decreased from 25 instances to 1 instance, or from 63% of the intervals to 3% of the intervals.

Over the course of this study, the play behaviors that were most impacted were Playing with Toy in Bin #1 (PWT1) and Playing with Toy in Bin #2. Figure 1 displays the dramatic increase in the child playing with the toy in the first bin from the baseline session to the fourth and sixth phase of the study. A slight increase is also found from the last teaching session to the first follow-up session where the instances of the behavior then plateau. A similar trend can be seen in the representation of the data for Playing with Toy in Bin #2 (Figure 2). However, there is a drop in the behavior that can be seen from the

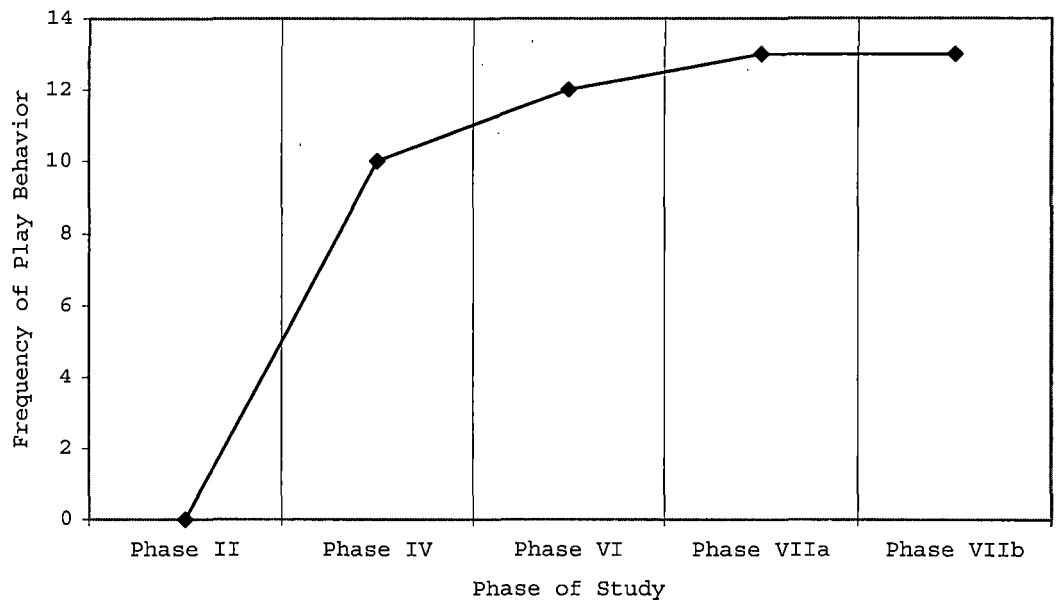

Figure 1. Frequencies Across Phases for Playing with Toys in Bin #1 (PWT1)

first to the second follow-up session. In looking at the representation for Other Actions [OA] (Figure 3) there is a notable decrease in these behaviors from the baseline to the fourth phase, and then another decrease to the sixth phase. The behavior then levels off at low instances across the follow-up sessions. The decrease in this behavior suggests that there is an increase in more appropriate behaviors which are incompatible with inappropriate behaviors.

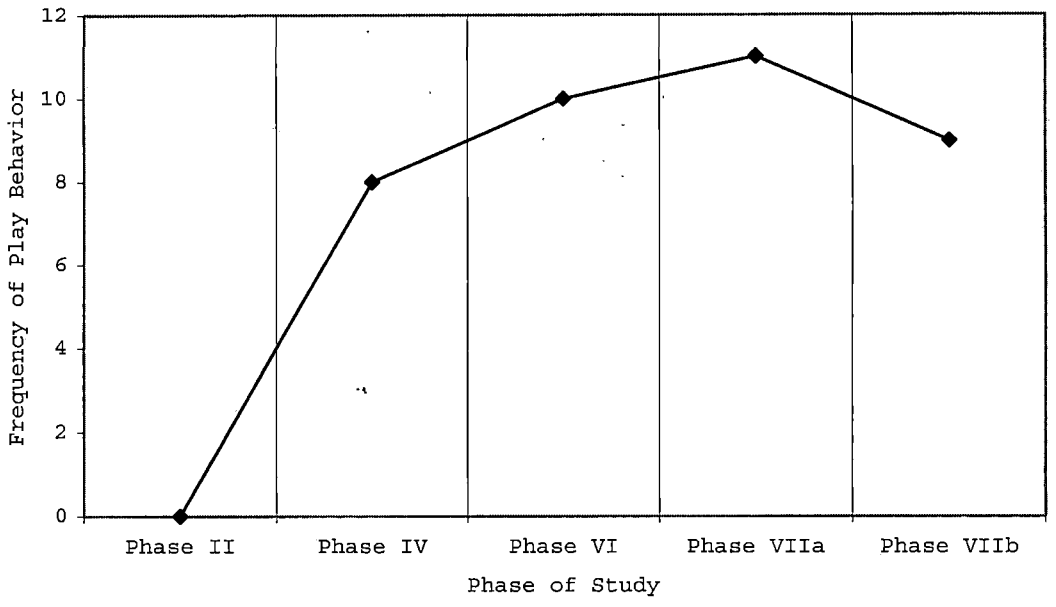

Figure 2. Frequencies Across Phases for Playing with Toys in Bin #2 (PWT2)

The second prediction stated that as the child becomes more competent in completing the play schedule and as the amount of play behaviors increase, there would be a decrease in the frequency of engagement in self-stimulatory behaviors as well as a decrease in the child engaging in activities other than appropriate interaction with the materials presented. Simultaneously, it was expected that there would be an increase in the child's appropriate eye contact and his ability to maintain an alert, attentive state. To test this prediction, the frequencies of all of the child's

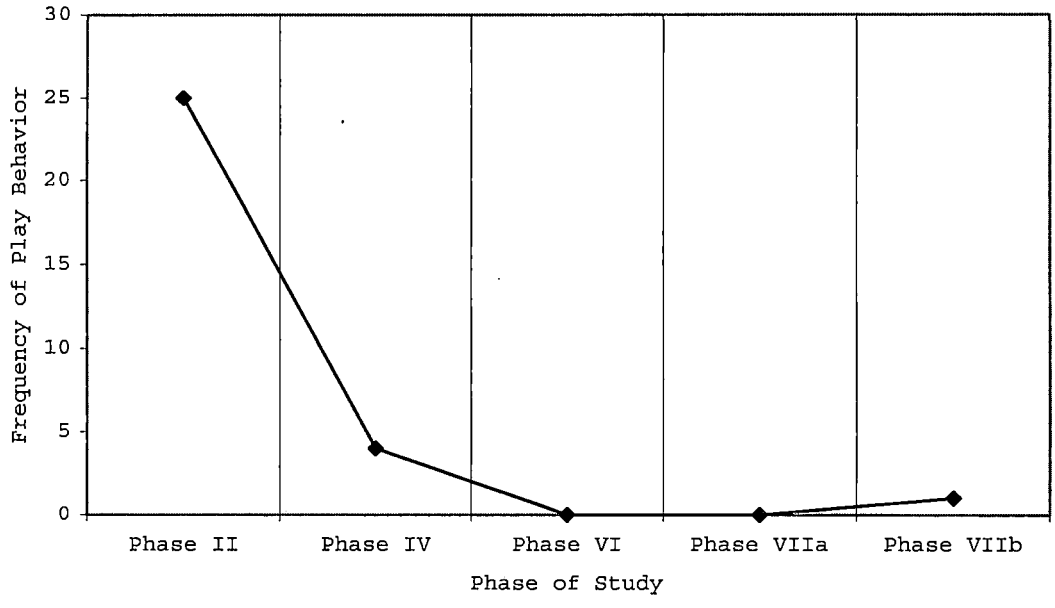

Figure 3. Frequencies Across Phases for Other Actions (OA)

behaviors being examined were compared between the baseline session (Phase II) and the subsequent phases (Phases IV, VI and the two follow-up sessions (Phases VIIa and VIIb). Percentages were also calculated to assess the percentage of intervals (where data was taken) that the child was engaging in these behaviors out of the entire phase.

Results showed that for Phase II and Phase IV, the child's Attentive State (AS) increased significantly (Table 12). The instances of the child maintaining an attentive state increased from 0 to 30, or from 0% of the intervals to 75% of the intervals. There was also a

Table 12. Chi-Square Values for Child Behaviors Comparing Phase II (Baseline) to Phase IV (Assessment #1)

	Phase II Frequency	Phase IV Frequency	χ^2	Sig
SS (Self-Stimulatory Behaviors)	34	8	16.10	sig $p<0.05$
AEC (Appropriate Eye Contact)	6	2	2	ns
AS (Attentive State)	0	30	30	sig $p<0.05$

significant decrease in Self-Stimulatory Behaviors (SS) (which decreased from 34 instances, or 85% of the intervals, to 8 instances, or 20% of the intervals), and Appropriate Eye Contact (AEC) (which decreased from 6 instances, or 15% of the intervals, to 2 instances, or 5% of the intervals) from Phase II to Phase IV.

During the second period being examined, Phase II to Phase VI, Attentive State (AS) was the only behavior that increased (Table 13). The child displayed an attentive

Table 13. Chi-Square Values for Child Behaviors Comparing Phase II (Baseline) to Phase VI (Assessment #2)

	Phase II Frequency	Phase VI Frequency	χ^2	Sig
SS (Self-Stimulatory Behaviors)	34	5	21.58	sig $p<0.05$
AEC (Appropriate Eye Contact)	6	0	6	sig $p<0.05$
AS (Attentive State)	0	35	35	sig $p<0.05$

state 88% (or 35 instances) of the intervals in Phase VI, which was an increase from the 0% (0 instances) displayed in the baseline session. Appropriate Eye Contact (AEC) and Self-Stimulatory Behaviors (SS) decreased between the baseline (Phase II) and this second assessment (Phase VI). Both decreases were significant, with Self-Stimulatory Behaviors decreasing from 85% of the intervals (34 instances) to 13% of the intervals (5 instances). Appropriate Eye Contact decreased from 15% of the intervals (6 instances) to 0% of the intervals (0 instances). This may be due more to the operational definitions of Appropriate Eye Contact (AEC) and the fact that child behaviors could not be simultaneously coded.

When comparing Phase II (baseline) to the first follow-up session (Phase VIIa), which took place one week following the last assessment (Phase VI), the child's Attentive State (AS) was the only behavior to increase and did so from the baseline measure of 0 instances (0% of the intervals) to 37 instances (93% of the intervals) (Table 14). Self-Stimulatory Behaviors (SS) and Appropriate Eye Contact (AEC) both decreased from the baseline session to the first follow-up session. Instances of Self-Stimulatory Behaviors (SS) decreased from 34 (85% of the intervals) to 3 (8% of the intervals). Instances of Appropriate Eye

Contact decreased from 6 (15% of the intervals) to 0 (0% of the intervals).

Table 14. Chi-Square Values for Child Behaviors Comparing Phase II (Baseline) to Phase VIIa (Follow-up #1)

	Phase II Frequency	Phase VIIa Frequency	$\chi 2$	Sig
SS (Self-Stimulatory Behaviors)	34	3	25.98	sig $p<0.05$
AEC (Appropriate Eye Contact)	6	0	6	sig $p<0.05$
AS (Attentive State)	0	37	37	sig $p<0.05$

Lastly, the frequencies of child behaviors were compared between the baseline session (Phase II) and the final follow-up session (Phase VIIb), which took place two weeks following the final assessment phase (Phase VI) (see Table 15). A significant decrease was found for Self-Stimulatory Behaviors (SS)(which decreased from 34 instances (85% of the intervals) to 5 instances (13% of

Table 15. Chi-Square Values for Child Behaviors Comparing Phase II (Baseline) to Phase VIIb (Follow-up #2)

	Phase II Frequency	Phase VIIb Frequency	$\chi 2$	Sig
SS (Self-Stimulatory Behaviors)	34	5	21.56	sig $p<0.05$
AEC (Appropriate Eye Contact)	6	1	3.58	ns
AS (Attentive State)	0	34	34	sig $p<0.05$

the intervals). Appropriate Eye Contact (AEC) decreased as well between these two phases, from 6 instances (15% of the intervals) during the baseline to 1 instance (3% of the intervals) in the second follow-up session. Attentive State (AS) was the only child behavior to increase over these phases. The child displayed an Attentive State 0% of the intervals (0 instances) during the baseline phase compared to 85% of the intervals (34 instances) during the second follow-up phase.

The child behaviors that were most influenced by the study were Self-Stimulatory Behaviors (SS) and Attentive State (AS). Figure 4 represents the data for the Self-Stimulatory Behaviors (SS). The child's self-stimulatory behaviors decrease across phases four, six, and the first follow-up session. There is a very slight increase in these behaviors that can be seen between the first and second follow-up session. Lastly, looking at the other child behavior that was most influenced, Attentive State (AS), an increase can be seen across phases four, six, and the first follow-up session (Figure 4). A slight decrease is seen between the first and second follow-up sessions suggesting that there may be a loss of treatment effect over time.

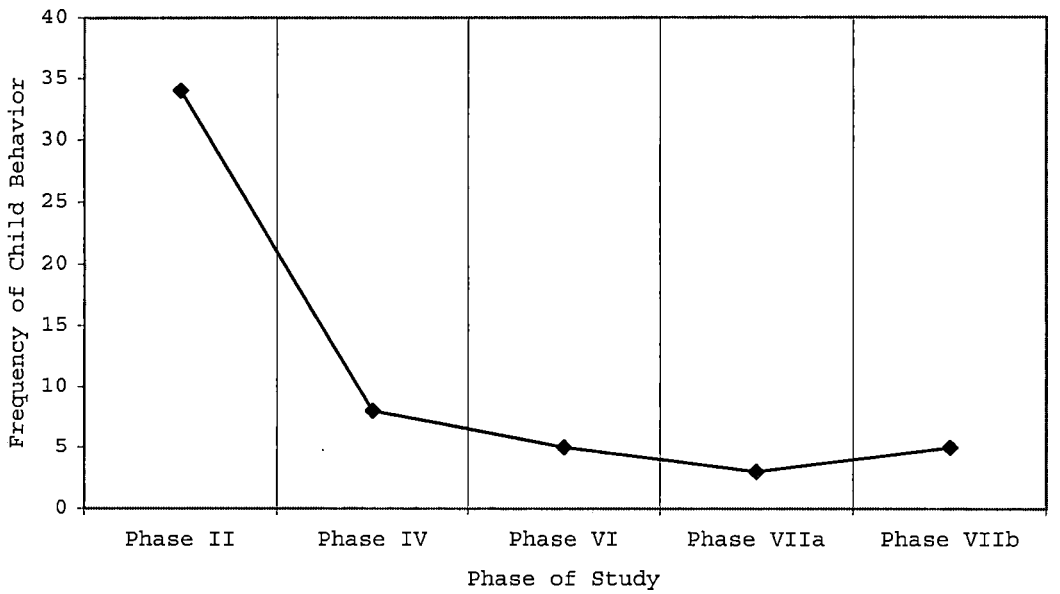

Figure 4. Frequencies Across Phases for Self-Stimulatory Behaviors (SS)

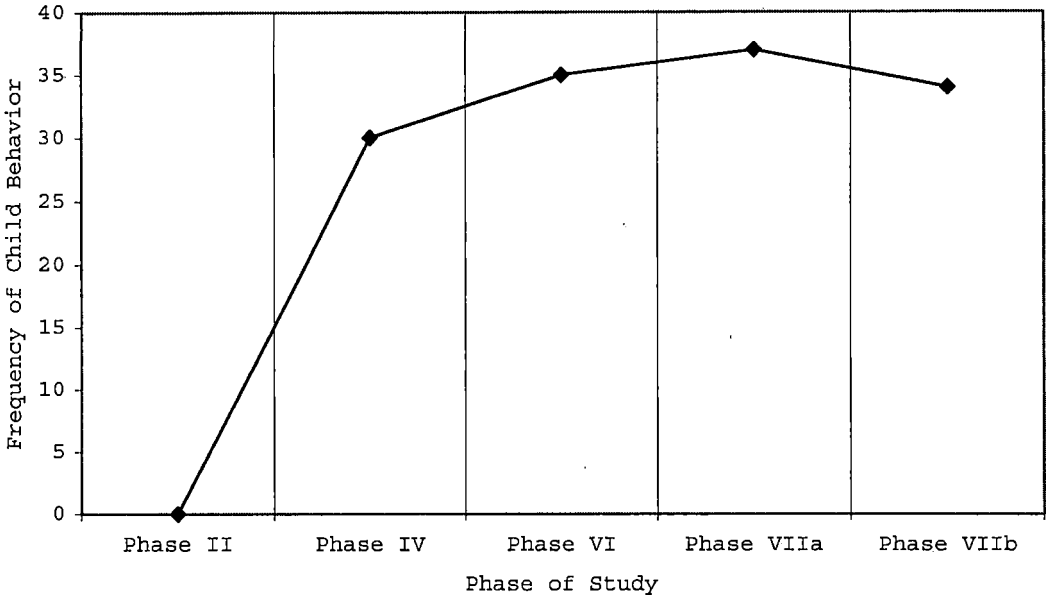

Figure 5. Frequencies Across Phases for Attentive State (AS)

CHAPTER FOUR

DISCUSSION

Summary of Findings

The purpose of this study was to address a major deficit in children with autism. Other than lack of eye contact, language delays, and inappropriate social interactions, the other consistent trademark symptom in the diagnosis of autism is a deficit in play skills. Stahmer (1995) concluded from his research that skills relating to play activities were not inherent with autistic individuals and did not occur without being systematically taught. Children with autism not only lack the ability to engage in age-appropriate play, but have difficulty occupying themselves with independent activities. Instead, most of these children spend their unstructured time engaging in self-stimulatory behaviors. These behaviors not only keep these children isolated from the world around them, but make them less approachable to their typical peers. Utilizing methods previously found successful in teaching these children, as well as capitalizing on their visual strengths and need for structure, this study attempted to teach a child with

autism to follow an activity schedule to complete a series of independent play tasks.

After a series of teaching sessions, which systematically decreased in the amount of prompting given by the examiner, the child increased the behaviors necessary to follow the components of the play schedule. However, at the time of the study's completion, the child was still not able to follow the entire sequence of the schedule and all of its components without error. Although he did successfully respond to each individual schedule component over the course of treatment and assessment, he was inconsistent in following all components to complete the schedule during the follow-up sessions, which were performed one and two weeks after the final assessment phase of the study. This suggested that the skills taught had not achieved mastery level.

Some possible explanations for why all of the components were not learned and successfully completed sequentially, may be related to the length of the study and that there may not have been enough time given to substantially fade the prompts. The fact that the child was able to learn the basic sequence of the activity schedule and increase his completion of the majority of the schedule behaviors indicates this is a technique that

can be useful in structuring play for this child with autism. However, it's possible that this child may need more teaching sessions to correctly learn the sequence of the various components as well as more time to fade the prompting before expecting him to be successful independently.

It also needs to be noted that the overall increase in playing with toys seen, while not necessarily meeting the specific expectations of this study, is very important in the growing research regarding play and children with autism. This demonstrates that even when not following a specific schedule accurately, the child was able to appropriately play with materials present without adult support or prompting.

It was also predicted that the introduction of the play schedule and the structured environment that it provided would lead to a decrease in inappropriate and stereotypical behaviors. This was found to be true in looking at the decreased frequencies of inappropriate behaviors over the course of treatment. As the child's exposure to the play schedule and activities increased, his instances of engaging in self-stimulatory behaviors decreased. Previous research involving children with autism has shown that when these individuals are engaged

in activities that are incompatible with their stereotypic behaviors, these will decrease (Lovaas, 1967). This is also consistent with findings by Koegel, Firestone, Kramme, and Dunlap (1974) who found that instances of spontaneous play increased when self-stimulatory behaviors were suppressed. The self-stimulatory behaviors the child involved in the study typically engaged in were hand flapping and head shaking. These were made more difficult when the child was repeatedly prompted to follow the play schedule in the teaching sessions. It should be noted that children with autism vary greatly in the stereotypical behaviors they display. Some are very obvious such as those the child in this study engaged in, while others such as visual gazing or repetitive verbal routines are quite subtle. This requires that in order to suppress these behaviors, the activities have to be tailored to the specific child so that they create an environment where the child cannot easily engage in their particular self-stimulatory behaviors. For children who do a lot of verbal stereotypy, an auditory activity may be selected as it has been found these individuals have difficulty sustaining a verbal routine when they are listening to something unrelated.

The child who participated in this study currently attends a school for the hearing impaired and is placed in a classroom for children with a variety of handicaps. He also receives four hours daily of individual behavior intervention and discrete-trial training to increase his academic level, broaden his play and social repertoire, and learn self-help and daily living skills. After the completion of the study and analysis of the results, the information was presented and discussed with the child's parents, classroom teacher, classroom aide, and in-home therapists. They were then trained to teach the play schedule and how to gradually fade assistance to increase independence. The play schedule will continue to be taught at home by the child's behavior therapist using the same materials as were used in the study until mastery has been achieved with those items. Then new materials will be introduced to ensure that the child has learned how to follow the schedule regardless of the items presented. Only after the child is able to do this will the schedule be introduced in the school setting and used by the parents in the home for unstructured time. Ideally, the play activity schedule will not only increase the child's repertoire of materials he can successfully manipulate, but will enable him to successfully occupy himself

appropriately without engaging in constant self-stimulatory behavior.

The results of this study are encouraging in that they suggest the child is able to learn to complete the various components necessary to complete the play schedule and that with subsequent teaching sessions, he will ideally become increasingly independent in following the schedule without errors. Another encouraging finding is that over the course of treatment and assessment, the frequencies of appropriate play increased significantly. Even when errors were made in the completion of the individual sequence components, there was still evidence of the child attending to the materials appropriately more frequently than during the baseline session. Although this was not a specific treatment goal, it may provide evidence that repeated exposure to certain materials eventually increases the likelihood of the child interacting with those items and sustaining play without adult instruction to do so. Coe, Matson, Fee, Manikam and Linarello (1990) found that once a play skill had been put into an autistic child's repertoire, they were more likely to spontaneously engage in the activity again at a later time. The organization of the items in a schedule format with a distinct beginning and end may make the activities

themselves more reinforcing to the child, which may have also aided in the child's success. Children with autism have been repeatedly found to crave structure and order and perform better when consistent structure is provided. If the activities themselves become more reinforcing to the child, he may be more likely to interact with the same or similar materials in other settings when the schedule is not present.

Implications of Findings

The technique of the utilization of the picture schedule used in this study to teach independent play could be used to teach individuals with autism a variety of skills that involve a specific sequence of events to complete a task. Examples of this could be to teach a child to dress himself, toileting behavior, following a classroom routine, preparing a snack, etc. The picture schedule provides a very concrete structure for the child to rely on to remind him or her of the sequence he or she must follow to complete a task. It also encourages independence, which is ideal for daily living skills so that the child can begin to become increasingly less dependent on adults to assist him in these tasks.

Limitations and Future Directions

This study had several limitations. Due to the nature of the study and of the disorder being studied (autism) only one participant was used. This makes generalizing the results to the overall autistic population difficult. Much more research needs to be done in this area with autistic children of various functioning levels to be able to conclude how effective this technique is in teaching skills to the autistic population. When replicating this study, changes must be made to account for the child's age, language level, motor abilities, etc. There also needs to be thought given to the amount of time necessary to teach the child to follow the schedule. In this case, the amount of time allotted was insufficient, leaving the child at the end of the study unable to independently complete the play schedule. In this case those working with the child were taught the techniques necessary to continue teaching, as well as how to systematically fade their prompting and eventually move the task into various settings. In future research, a plan may need to be made prior to the implementation of the procedure in the event that the time is not sufficient for the child to acquire the skills.

To increase the likelihood that the child can learn to successfully complete the activity schedule, the procedure may need to be lengthened and adapted to the child's learning style. Ideally, the child should learn at the pace necessary for him to master the components sequentially, and prompting should not be faded until the child is able to be successful without it. This may require a longer series of sessions, but may make it more likely that the child would be able to be successful being completely independent. Follow-up sessions would still be required however, to assess the child's performance and give additional teaching sessions if necessary.

Lastly, in evaluating the coding procedure it was apparent that the codes may have not been sufficiently discrete. In coding AEC (appropriate eye contact) for instance, it was not taken into account that although the child may be in fact engaging in appropriate eye contact (a positive factor) he may be neglecting to play with the toys or manipulating the schedule (a negative factor). Future research should be done to combine codes so that in analyzing the data it is clear which behaviors are appropriate versus inappropriate for that particular time interval

Conclusions

The results of the study suggest that although the time period for achieving mastery of the independent play schedule may need to be increased, the child made significant gains in following the schedule components and increased not only the behaviors necessary to follow the sequence, but increased his overall incidences of interacting with the materials presented. The increase in these appropriate interactions with the play activities simultaneously led to a decrease in the child's previously incessant self-stimulatory and inappropriate behaviors. There is evidence that this child may become increasingly successful with further teaching of the schedule and eventual manipulation of the schedule to gradually include more and more items over a variety of settings. There is also suggestion that this technique capitalizes on the strengths of these children by using visual cues and by providing a structure that in itself may be reinforcing for the child. Further sessions will be done to follow up with the child's therapy team to see how they are implementing the play schedule into his daily routine as well as suggestions for ways they may use this technique to teach other skills the child has trouble completing independently.

As the number of children diagnosed with autism rapidly increases, there is going to be an increasing demand for effective ways of teaching these children skills necessary to be as self-sufficient as possible. Teaching independence to these individuals is going to become critical in enhancing the lives of those with autism as well as the lives of those who interact with these people. Studies such as this also add to the ever-growing body of research existing on autistic spectrum disorders and how best to teach individuals who exhibit these symptoms.

APPENDIX A

INFORMED CONSENT FORM

CALIFORNIA STATE UNIVERSITY
SAN BERNARDINO

The California
State University

Informed Consent Form

TITLE OF STUDY: Teaching a Child with Autism to use an Independent Play Activity Schedule Using Prompting and Reinforcement Procedures

RESEARCHERS: Kori Saunby, Masters Candidate,
Psychology Department, California State University, San Bernardino
Laura Kamptner, Ph.D., Department of Psychology,
California State University, San Bernardino
(909) 880-5582

Dear Baker Ostrin and Audrey Schultz,

We would like to ask your permission for your child Marshall to participate in a study conducted by Kori Saunby under the supervision of Dr. Laura Kamptner. This study has been approved by California State University's Institutional Review Board. The project, entitled "Teaching a Child with Autism to use an Independent Play Activity Schedule Using Prompting and Reinforcement Procedures" will utilize the same methodologies Marshall is currently being taught with to expand to their play repertoire and attempt to teach some basic independent play skills.

If you are comfortable with Marshall participating in the study, he will be involved in a series of teaching sessions which will be followed by evaluations of his progress. This will take place over several weeks and then be followed by two follow-up sessions to evaluate your his retention of the skills acquired.

Marshall's participation in this study is completely voluntary. You may choose for your him not to participate, or if you do consent for his participation, you may withdraw him or her from the study at any time.

The information gathered in this study is completely confidential. Your child's name will not be used in any part of the study other than in the consent forms and any follow-up recommendations provided to you after the completion of the study. All videotapes taken will be used only by researchers for the sake of data analysis. They will not be aired for any other audience. If you have additional questions you may contact Kori Saunby or Dr.Laura Kamptner at (909) 880-5582.

By signing in the space below, you acknowledge that you have been informed of and understand the nature of the study, and you freely consent for Marshall to participate. You understand that the information obtained from this study and all videotapes taken will remain confidential and that you may withdraw your consent for your child at any time.

I give consent for my child to participate in this study

X _____ 6/02/02 _____

Sign here Date

DEPARTMENT
OF
PSYCHOLOGY

909/880-5570

fax 909/880-7703

5500 University Parkway, San Bernardino, CA 92407-2397

APPENDIX B

CONSENT TO VIDEOTAPE

CALIFORNIA STATE UNIVERSITY
SAN BERNARDINO

The California
State University

Consent to Videotape

TITLE OF STUDY: Teaching a Child with Autism to use an Independent Play Activity Schedule Using Prompting and Reinforcement Procedures

RESEARCHERS: Kori Saunby, Masters Candidate,
Psychology Department, California State University, San Bernardino
Laura Kamptner, Ph.D., Department of Psychology,
California State University, San Bernardino
(909) 880-5582

Dear Baker Ostrin and Audrey Schultz,

As part of the study you have agreed that your child Marshall participate in, we will be making videotapes of each session so that they may be further analyzed for data collection purposes. These will only be viewed by the researchers and anyone participating in the study to collect the data necessary to make any empirical conclusions. These tapes will not be shown for any other purpose and at completion of the study the tapes will be given to you to use at your own discretion.

Marshall's participation in this study is completely voluntary. You may choose for your him not to participate, or if you do consent for his participation, you may withdraw him or her from the study at any time.

By signing in the space below, you acknowledge that you have been informed of and understand the nature of the study, and you freely consent for Marshall to participate and be videotaped solely for the purposes of the study. You understand that the information obtained from this study and all videotapes taken will remain confidential and that you may withdraw your consent for your child at any time. If you have additional questions you may contact Kori Saunby or Dr.Laura Kamptner at (909) 880-5582.

I give consent for my child to be videotaped for the purposes of the study

X _____ 6/02/02 _____

Sign here Date

DEPARTMENT
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PSYCHOLOGY

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APPENDIX C

DEBRIEFING STATEMENT

CALIFORNIA STATE UNIVERSITY
SAN BERNARDINO

The California
State University

Debriefing Statement

Thank you for allowing Marshall to participate in this study concerning the teaching of independent play skills to a child with autism. The purpose of this study is to determine whether or not the independent play activity schedule is an effective way of teaching your child to engage independently in play activities. The findings of this study will hopefully help Marshall by giving him a structured means by which he can engage in appropriate play by himself without constant redirection to remain on task by a parent or educator. The findings will also add to the limited amount of research available on what techniques are successful in teaching children with autism to follow a picture schedule as well as engage in independent play.

DEPARTMENT
OF
PSYCHOLOGY

909/880-5570

fax 909/880-7703

We anticipate the results of this study to be available after August 1, 2002. When the results are available you will be contacted to go over the results and relay to you information regarding whether or not this technique may be helpful to implement into Marshall's home or school program.

Please contact Dr. Laura Kamptner or Kori Saunby at (909) 880-5582 if you have any questions or concerns about your child's participation in the study. Again, we appreciate you letting Marshall participate in this project.

Sincerely,

Kori Saunby
Masters Candidate

Laura Kamptner
Psychology Department

5500 University Parkway, San Bernardino, CA 92407-2397

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