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USING APPLIED BEHAVIOR ANALYSIS TO INCREASE COMPLIANCE WITH A
CHILD WITH AUTISM

By
Rachael Simon

A Thesis

Submitted in partial fulfillment of the requirements of the
Master of Arts Degree
Of
The Graduate School
At
Rowan University
April 14, 2004

Approved by

Date Approved 5/4/04

ABSTRACT

Rachael Simon

**USING APPLIED BEHAVIOR ANALYSIS TO INCREASE COMPLIANCE WITH A
CHILD WITH AUTISM**

2003/2004

Dr. John Klanderman

Master of Arts in School Psychology

The purpose of this study was to take an in depth look at ways to modify the specific behavior compliance of a child diagnosed with autism. The subject studied was a two year eleven month year old female who had a diagnosis of severe to moderate autism. Over a five week period, applied behavior analysis, a behavior technique, used for individuals with autism, was implemented into her educational programming. Data was collected over this five week period and a one way mixed analysis of variance (ANOVA) was completed in order to see if her compliance rate had increased after using the applied behavior analysis technique. The results were statistically significant. Implications for using the applied behavior technique are discussed.

Acknowledgments

I want to thank Dr. Klanderman for all his help with my thesis and for giving me some great advice about the career of school psychology. I look forward to starting my profession and know I will do great in the field because of all of his wonderful teaching.

I also want to especially thank Dr. Dihoff for all of her support during this stressful year and for putting up with all of my anxiety. She is truly an inspiration and I only hope one day I can inspire someone the way she has inspired me.

Lastly, I want to thank my friends and my family for dealing with me this past year. I know it has not been easy. I am lucky to have such wonderful and supportive people in my life. I succeed in life because I work hard, but also because love surrounds me wherever I go in life. Thank you all. I dedicate my thesis to all of you.

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Chapter One

Need:

Autism is a developmental disorder that is usually identified before three years of age. The disorder used to be considered a rare condition, however now it is increasing at an alarming rate. Autism is even being referred to as the new “epidemic”.

The rise of the disorder is unknown. Some think it is simply due to better reporting. Others believe the cause is pollution. A newer belief is that the MMR (measles, mumps, rubella) vaccine, given in early childhood is to blame. Evidence does exist to support this theory. The Japan government has even banned the use of this vaccine.

Autism is recognized or diagnosed after the parents observe delays in the development of the child’s language, play, and social interaction. Autistic children often have limited or no speech, poor communication skills and social skills, a defective cognition, and are sometimes sensitive to touch or specific sounds.

In this specific study, the child diagnosed with autism was two and a half years old. She had no speech and very little social interaction. In fact the only person she would interact with was her mother. In order to help this child communicate and learn, she must first be able to attend and comply. Compliance is the first step to education.

Purpose:

The purpose of this study was to take an in depth look at ways to modify the behavior of a child diagnosed with autism. Specifically the behavior that was observed was compliance.

Hypothesis:

Using the behavior technique, Applied Behavior Analysis (ABA). compliance will increase with a child diagnosed with autism.

Background:

Dr. Leo Kanner, a psychiatrist at Johns Hopkins University coined the term “autism” in 1943 to describe a group of children who were extremely self-absorbed in a world of their own, emotionally and intellectually detached from other people, and show severe social, communication, and behavioral problems.

One-half a million Americans today have some form of Autism and it is the third most common developmental disability. Three important facts to remember about autism is that it is not a mental illness, it is not caused by “bad” or insensitive parenting, and no known psychological factors in the development of the child have been shown to cause the disorder.

The characteristics of autism sometimes are visible shortly after birth, but in some cases, it is delayed for up to two or three years. Some signs that an infant who has autism

might portray are being limp, not wanting to be picked up, and avoiding physical contact with his or her caretaker. About one-third of autistic children develop normally until somewhere between the ages one and a half to three where their development begins to delay.

Autism is “estimated to affect 5-15 of every 10,000 children born worldwide regardless of race, culture, parental characteristics, or family socioeconomic status. Boys are affected about three to four times more often than girls (Maurice, xiii).

A child who is suspected to have autism should be evaluated by numerous qualified individuals, which may include a neurologist, psychologist, pediatrician, speech and language pathologist, learning consultant, and or other professionals who have a good amount of knowledge about autism. The reason the child should be looked at by numerous individuals is because autism may be confused with other similar conditions. The diagnosis of autism is given when an individual displays a number of characteristic behaviors, since at this time no physiological tests exist to diagnose a person with autism.

After a child is diagnosed with autism, different treatments can take place to help the child. The main treatment that will be discussed in this study is Applied Behavior Analysis.

In 1913, John Watson identified observable behavior as the proper subject matter for psychology and stated that all behavior is controlled by environmental events. Watson came up with the stimulus-response psychology that started the movement called behaviorism.

Then in the 1960's Ivar Lovaas came up with a curriculum of programs, a teaching sequence for these programs, and then discussed how to teach them. The means by which these skills were taught was applied behavior analysis. The Lovaas program was the first application of behavior analysis used to teach individuals with autism. Since then, numerous other approaches have been used that fall under the applied behavioral analysis umbrella. ABA's main intention is to change the behavior in order to improve the life of the individual.

Another behavioral treatment for autism is known as Applied Verbal Behavior. Applied Verbal Behavior is similar to applied behavior analysis except that it focuses on teaching verbal behavior through a collection of highly effective teaching procedures taken from the science of behavior analysis.

In 1957, theorist Skinner published *Verbal Behavior*, which gave a full description and definition of verbal behavior. His text extended operant conditioning to verbal behavior in order to fully account for the range of human behavior. Skinner described the important units of language in *Verbal Behavior*.

Applied Verbal Behavior is a specialty within the field of Applied Behavior Analysis that addresses the problems in the development of communication seen in most children diagnosed with autism by stressing functional language and connecting it to motivational variables.

Definitions:

Autism-a severe developmental disorder in which children seem isolated from the world around them. Symptoms often include a lack of hearing, language, and vision skills, and an inability to handle social situations, and behavioral problems.

Applied Behavior Analysis (ABA)- a discrete presentation of stimuli with responses followed by immediate feedback whether it is positive or negative. An intense schedule of reinforcement, data collection, and systematic trials of instruction should be present (Schoen, 125).

Applied Verbal Behavior- a specialty within the field of Applied Behavior Analysis, which looks at the functions of the different units of language. The behavioral analysis of language separates the components of language into several verbal components. The duplic, the intraverbal, the mand, and the tact.

Duplic- a verbal behavior whose form is controlled by someone else's verbal behavior (Carbone, 52).

Intraverbal- verbal behavior, which is under the control of other verbal behavior and is strengthened by social reinforcement (Carbone, 54).

Mand- a verbal behavior in which the form of the response is controlled by the motivational or aversive condition which determined the behavior (Carbone, 51).

Tact- a verbal behavior under the control of the nonverbal environment, which includes, nouns, adjectives, pronouns, actions, relations, etc (Carbone, 53).

Assumptions:

It was important to assume that the child used in this experiment did not have any other emotional problems and no comorbidity existed that could have interfered with experiment or affected the data collected.

Lastly it was necessary to assume that consistency occurred in the home. It was essential that her parents worked on the skills and techniques that were taught to her. Repetition of these techniques and exercises are imperative for the child's success.

Limitations:

A limitation of this study was that it was a case study and only focused on one child.

Summary:

In the upcoming chapters, different topics will be taking place. In chapter two, an extensive amount of research will take place having to do with other experiments or studies relating to this specific study. In chapter three, the process of the experiment will be explained. Next, in chapter four, the data will occur and be analyzed. Chapter 5 will be the discussion and the conclusion of the whole entire study.

Chapter Two

Introduction:

A typically developing child will have no problem asking for what they want and need. A typically developing child will have good social skills. A typically developing child will be able to comply with simple directions and commands. However, children diagnosed with autism often have trouble with compliance, lack social skills, and have difficulty requesting. Children with autism often appear to be in a world of their own. Unfortunately no cure exists. On the other hand, many behavioral approaches do exist which help in the treatment of autism. Two approaches used often are Applied Behavior Analysis and Applied Verbal Behavior. Research has shown that the earlier interventions take place in a child's life the better the outlook is for that child.

Autism:

"Today Autism is viewed by the Diagnostic and Statistical Manual as a pervasive developmental disorder (PDD) marked by abnormal or impaired development in social interaction and communication combined with a restricted repertoire of activities or interests" (Gresgam, Beebe-Frankenberger, & MacMillan, 1999). "In the domain of communication, one criterion that is used to document the presence of autistic disorder is the delay or absence of spoken language"(Kjelgaard, M.M & Tager-Flusberg, H., 2001).

Children are not usually diagnosed with autism until two or three years of age and the earlier the disorder is diagnosed, the better the prognosis. Autism occurs in about one per one thousand individuals and is three to four more times common in boys than in girls. Autism is “a disorder characterized by a lack of social interest and interaction with the environment” (McGrath, Bosch, Sullivan, & Fuqua, 2003). Children with autism usually lack social skills and without intervention, these skills will become more debilitating. “Beginning in the 1960’s; intervention procedures for children with autism began to focus on social learning theory, and behavioral intervention techniques were developed based on principles of learning” (Koegel, Koegel, & McNerney, 2001).

“Children with autism exhibit a bewildering array of behavioral deficits in attention, cognition, speech, language, affect, and social functioning, coupled with behavioral excesses, ranging from noncompliance to explosive aggression and self-injurious behavior” (Gresam, Beebe-Frankenberger, & MacMillan, 1999).

“A young child with autism may receive services in an integrated developmental preschool setting focusing on communication, play, and peer interaction, but also receive traditional applied behavior analysis treatment in additional home-based therapy focusing on readiness skills and “compliance training”, with little coordination between settings” (Prizant, Wetherby, Rubin, & Laurent, 2003).

“It is estimated that one third to one half of children and adults with autism do not use speech functionally” (Mirenda, 2003). “ Expressive speech function in individuals with autism range from total lack of speech to fluent speech.

Approximately fifty percent of individuals with autism are unable to develop speech that is sufficient to meet their daily communication needs” (Koul, Schlosser, & Sancibrian, 2001).

Early Intervention For Children With Disabilities:

“Providing early treatment of language and communication disorders is important because the intervention may have a significant positive impact on children’s development. Thirty-nine language and communication intervention research articles that were published from 1986 to 1996 found three consistent results. First early intervention can be effective for all kinds of language and communication disorders. Second intervening when children are younger is better than implementing intervention later in development. Third, effective intervention depends on sound clinical judgment to determine intervention targets, settings, and strategies” (McCathren, 2000).

Several programs offer early intervention services for children that have special needs. One of the disorders that children are often diagnosed with that require early intervention is Autism Spectrum Disorder. “The most well known of these early intervention programs for a child diagnosed with Autism reported that nine of nineteen children who received intensive early intervention successfully completed first grade and obtained average or above average IQ scores” (Arick, et al., 2003).

Studies have been conducted on numerous types of early intervention studies. “It

has been concluded that early intervention based on Applied Behavior Analysis can produce large, comprehensive, lasting, and meaningful improvements in many important domains for a large proportion of children with autism. Behavioral intervention is more effective for young children than no intervention or other interventions, and the best outcomes have been reported for children who began the program at two or three years of age”(Dempsey & Foreman, 2001).

In the 1960’s a man named Ivar Lovaas came up with his own application of Applied Behavior Analysis. His program was the first application of Applied Behavior Analysis to be used with individuals with Autism. Lovaas and his colleagues have published numerous reviews of the UCLA early intervention program for children with autism. “Follow-up data from a treatment group showed that forty seven percent achieved normal intellectual and educational functioning, with normal range IQ scores and successful first grade performance in public schools” (Dempsey & Foreman, 2001).

The use of early intervention has helped children with autism to start their education early and has helped to increase their language and communication skills. Without early intervention, children with autism would be way behind in many of their skills as compared to a typically developing child.

“Children and youth with autism spectrum disorders can be expected to make significant progress when diagnosed early and when exposed to structured, consistent programs based on effective intervention and educational methods. Among the best known of these effective strategies are those based on applied behavior analysis”

(Simpson, 2001).

Applied Behavior Analysis (ABA) and the Potential ABA Has in the Treatment of Children and Youth with Autism:

One behavior approach used in the treatment of autism is Applied Behavior Analysis (ABA). “ Applied Behavior Analysis is a scientific discipline that is interested in the application of behavioral principles to socially important problems” (Strain & Schwartz, 2001).

“Three decades of research had demonstrated that ABA has provided a menu of strategies demonstrated to be effective with autism to reduce stereotypic behaviors and to increase language and social initiation skills” (Dempsey & Foreman, 2001).

In order for Applied Behavior Analysis to be successful, the program provided to the child must be a highly structured format. “Applied Behavior Analysis is characterized by discrete presentation of stimuli with responses followed by immediate feedback, an intense schedule of reinforcement, data collection, and systematic trials of instruction” (Schoen, 2003). The process is very methodical. When using ABA each case is based on the individual child’s needs. The behavior that needs to be worked on depends on the specific child. “Once the behavior is identified, intervention strategies are determined to suit the situation and, then, used to modify the behavior. During this time, the instructor

provides reinforcement to elicit and maintain the desired behavior. Evaluations are made throughout the modification process to assess the effectiveness of the intervention. When an intervention is found to be ineffective, another strategy is substituted” (Schoen, 2003).

Reports show that “in many cases, when children with autism receive intensive intervention from first diagnosis, using data based approaches and scientifically validated techniques that are developed by applied behavior analysis, ideally for two to three years before the age of five, they may become indistinguishable from their elementary peers” (Kimball, 2002). Once again these studies reinforce how important early intervention for a child with autism can be for that child’s success.

“In a national study called Project Follow-Through, the findings supported the idea that direct instruction, behavior analysis methods, and additional behavioral approaches were the strongest ways of instruction for these children. There are also various associations, such as Families for Early Autism Treatment (FEAT), Parents for early Intervention of Autism in Children (PEACH), and New Jersey Center for Outreach and services for the Autism Community (COSAC), which support behavior-analytic treatment for autistic populations” (Schoen, 2003). Applied Behavior Analysis appears to be the best intervention for children with autism after reviewing all the research.

One of the main benefits of Applied Behavior Analysis is that ABA can be applied to many different areas of learning. “A major contribution of ABA has been its legacy of effective educational procedures. Included among the very large number of noteworthy intervention strategies derived from ABA are (a) motivational programs

based on positive reinforcement; (b) detailed and systematic task analyses for developing academic skills; (c) generalized techniques for building new skill repertoires through operations such as prompting, shaping, chaining, and fading; and (d) strategies of self-management (Dunlap, Kern, & Worcester, 2001).

The long-term success of an applied behavior analysis “is largely dependent on two variable: (a) the reduction of problem behavior by extinction and (b) the replacement of problem behavior with an appropriate alternative response” (Roberts, Luiten, Derby, Johnson, & Weber, 2001).

In order to help individuals with autism who do not speak communicate, other forms of communication are used. “Individuals with little or no functional speech as a result of autism spectrum disorders frequently rely on aided and unaided augmentative and alternative communication (AAC) symbols and signs to augment or replace natural speech” (Koul, Schlosser, & Sancibrian, 2001).

The Picture Exchange Communication System (PECS) is a type of communication-training program used with children diagnosed with autism. PECS requires students to point, touch, or tap pictures. “Training generally involves teaching children to respond to verbal prompts such as ‘point to the picture of the cup,’ or ‘show me the cup’” (Bondy & Frost, 1994).

“For nonverbal children, communication training with pictographic symbols has been effective in facilitating the functional use of graphic symbols to express basic wants and needs. Using a picture exchange system to train eighty-five nonverbal preschool

children with autism and PDD, it was reported that ninety-five percent learned to use two or more symbols for communication, and seventy-six percent used a combination of speech and graphic symbols to make requests and label items after six months of training” (Quill, 1995).

Applied Verbal Behavior (AVB) and the Potential AVB Has in the Treatment of Children and Youth with Autism:

Another approach used to treat children with autism is Applied Verbal Behavior (AVB), which is also sometimes referred to as Verbal Manding. Skinner was the first person to address this approach and discussed it in his book *Verbal Behavior*. He referred to specific concepts in his book such as the mand and the tact. “Technically, a mand is a behavior that specifies its reinforcer. A tact is a term that refers to the act of labeling or making contact with some aspect of the environment. The goal of the tact differs from a mand in that it is not intended to acquire the item, but rather to identify, point out, or comment on the item” (Harris & Delmolino, 2002). The first step in the process of Applied Verbal Behavior is typically mand training in order to increase a child’s range of requesting wanted items.

A study was conducted of twelve children who had challenging behavior. After a functional assessment, it was determined that the purpose of the challenging behavior was to request attention. The twelve children were then randomly assigned to

two intervention approaches. One group received functional communication training. The comparison group received time out from positive reinforcement. In the functional training group, the children were trained to request attention using verbal behavior. “In both intervention groups, the challenging behavior was reduced, although increases in unprompted communication were seen with the functional communication training group only. More importantly, the children who received functional communication training maintained the skills they acquired beyond intervention” (Buschbacher & Fox, 2003).

In an article entitled, *When the Toddler Takes Over: Changing Challenging Routines Into Conduits for Communication*, Woods & Goldstein describe “how challenging routines for families can be converted into opportunities to teach communication skills and increase participation in family activities” (2003). The article discusses a case study about a toddler named Kelly whose challenging behavior has begun to dictate her families’ daily routines. Due to Kelly’s difficulty with communication, times when Kelly needs to communicate often are challenging because she does not use words. “She only squeals, spits, and throws herself on the floor when angry” (Woods & Goldstein, 2003). The first step to changing Kelly’s behavior is identifying the challenging behavior and then coming up with a hypothesis to explain the reason behind this behavior. At mealtime when Kelly is given milk to drink, she throws herself backwards hitting her head on the floor. The hypothesis is that Kelly doesn’t like milk. She likes juice and having a temper tantrum is her way of expressing her emotion since she doesn’t use speech as a form of communication. “A first step in the process is to

teach Kelly to make choices between milk and juice by offering her both drinks in her favorite cups, asking her to choose with the verbal prompt, ‘What do you want to drink, Kelly?’ Kelly gets her drink (probably the juice), the outcome she desires, and she receives social reinforcement from mom” (Woods & Goldstein, 2003).

Kelly’s behavior is similar to the case being studied. Challenging behaviors will be addressed in the study. The specific behavior that will be attempted to change will be the behavior of noncompliance.

Using Prompts to Increase Compliance:

“Among children diagnosed with autism, noncompliance is a frequently occurring problem. Simple command such as ‘sit down’, ‘look at me’, and ‘count these blocks’ are often met with refusal accompanied by tantrum behavior. However, compliance with these commands or instructions is often a necessary prerequisite for the occurrence of effective instruction” (Ray, Skinner, & Watson, 1999).

A general prompt is a statement such as, “come here”, “stop”, or “sit down”. Often children with autism have trouble understanding these prompts. “One method for teaching skills to children with autism is to use levels of prompting (least intrusive to most intrusive). This method involves fading the prompts and then reinforcing prompted and non-prompted occurrences of the target behavior” (Terpstra, Higgins, & Pierce, 2002).

The Young Autism Project addresses the issue of compliance at the beginning. Compliance is necessary for the child to learn and is therefore the basis or beginning of their education. "Skills are taught in a sequence that approximates typical child development, but some skills are regarded as prerequisites for later learning. For example, initial skills all involve compliance to the teacher's spoken instructions. The curriculum typically begins by teaching the child to comply with the instruction to 'sit down'. It progresses to compliance with instructions for simple motor acts and to a series of motor acts. Next, the child is instructed to come when the parent calls his/her name. That response is chained to other previously mastered simple skills" (Olley, 1999).

A case study was done on a five-year old boy who was diagnosed with autism. Procedures were implemented to increase compliance because he was having outbursts and high rates of noncompliance in the classroom area. A school psychologist met with the parents and his teacher in order to discuss his inappropriate behavior and discuss what actions would take place. It was decided, "the primary target behavior would be to increase compliance with teacher issue commands by interspersing mother-issued commands prior to the teacher-issued commands" (Ray, Skinner, & Watson, 1999). Nine phases occurred in the behavioral treatment. During phase one baseline data was collected. "A compliance rate was determined by dividing the number of compliant responses by the total number of commands presented" (Ray, Skinner, & Watson, 1999). Both the parent and teacher were given the same list of commands that had been used. During stage two mother commanded only. The teacher would praise compliance, but

ignore noncompliance. In stage three teacher-commands were introduced. A seventy percent compliance rate was required before advancing to the next treatment phase. During stages four to eight fading procedures were implemented. Phase nine teacher commanded only and the commands took place during a normal class period so the parents were not in the room.

“During baseline, the young boy complied with-teacher issue commands less than fifteen percent of the time, but he complied with parent-issued commands more than fifty-seven percent of the time. This data confirmed the results that his compliance level depended upon who was giving the command. By phase eight during which the parent was present, but issued no commands, he complied with more than ninety-five percent of the teacher-issued commands. Data from phase nine showed that a high rate of compliance was maintained when the mother was no longer present and typical instructional procedures were being implemented” (Ray, Skinner, & Watson, 1999).

Another way to teach a behavior is to use a simple cue in order to indicate what behavior the person wants the child to display. For example, a teacher may say, “do this” while performing an action, to cue the child to perform this same action. The teacher is hoping the child will imitate his or her behavior. Immediately after the cue, the teacher may prompt the child by physically guiding the child to perform the action. “In the early stages of instruction, the teacher might reinforce the child for giving an approximation of the action being taught- for example, if the action is clapping the teacher might reinforce the child for simply putting his or hands together” (Smith, 2001). As the child progresses,

the teacher requires closer and closer approximations of the correct action and prompts are gradually faded out. These two implementations are known as shaping and prompt-fading. “With systematic shaping and prompt-fading, the child learns to perform the behavior accurately when cued to do so by the teacher” (Smith, 2001).

Making A Choice:

Children who are nonverbal often get frustrated because they have difficulty communicating their wants and needs. “One intervention option that may be helpful in such situations is choice-making, wherein the child is presented with different options for intervention. Each intervention option contains reinforcers, but the quality of reinforcement available for each option may vary” (Peck, Caniglia, & Royster, 2001).

Giving autistic children a way to make choices has helped to decrease behavior problems. “To promote the language skills and social interactions of young children with disabilities, a range of learning tasks were designed that allowed children with autism to make choices about the activities in which they would participate and found greater performance in the choice than in the no-choice condition” (Odom, et.al., 2003).

Summary:

Autism is a developmental disorder that affects a number of people. Even though no cure exists as of yet, several interventions have proven to be successful in the

treatment of children with autism. Applied Behavior Analysis and Applied Verbal Behavior are two similar treatment approaches that are used often with the autistic population. Research has shown that the earlier interventions take place, the better prognosis the child has in the future. Children with autism appear to have a number of impairments complicated by a multitude of behaviors. Deficits in verbal and nonverbal communication can be frustrating for a child with autism, as well as frustrating for his or her families. Learning to request what they want, and learning to comply with commands are two important basic skills that children need in order to function. These two skills are often worked on first during early intervention. Applied Behavior Analysis and Applied Verbal Behavior are two methods used to help teach a child these specific skills to autistic children.

Chapter Three

Introduction:

In chapter three, a description of the subject is discussed, as well as the procedures and measures of the case study. The analysis that will be used after collecting the data is also explained further.

Subject:

The subject used in this study was a two years and eleven months old female with a diagnosis of moderate to a severe autism. She is a generally healthy child with no other known medical complications. The subject is an adopted child and comes from a middle income, well-educated family. She is the only child. Her support services include early intervention, occupational therapy, developmental educational therapy, speech therapy, as well as she attends a playgroup of children with special needs once a week.

Procedures and Measures:

First, before the baseline was even begun, the parents were spoken to in order to find about high reinforcers. In this study, the child needs a variety of reinforcers.

During baseline, the speech therapist used no reinforcers. Three commands were worked on and one request. The three commands worked on comprehension skills and the

one request worked on communication skills. The tone of voice used by the speech therapist was loud, clear, and slow. She also encouraged eye contact.

Each command was presented ten times, but the therapist varied the presentation of commands. The three commands used were, “Come here”, “Stand up”, and “Sit down”.

In order to do requesting during baseline, the speech therapist put a number of items that the child likes on the table. The therapist had control over all the toys. If the child wanted to play with the toy, she had to come over to the table and point to it, grab for it, etc. These acts were her ways of requesting the toy.

During the intervention, reinforcers were introduced. In this study, the child’s reinforcers included, but did not exclude little m&m’s, ice cream, and blue clues cards. Also included in the intervention is parent participation. Parents were taught how to do these exercises so that these behaviors could be practiced and worked on even when the therapist is not at the house doing the therapy.

The commands were given in the same tone of voice as they were in the baseline and in the same variety, however a reinforcer was used in the intervention. The speech therapist said the command and presented the reinforcer with it. If the child followed the command, she was rewarded with the reinforcer. For example, the speech therapist held up an ice cream cone so that it was in the child’s view and said, “come here (name inserted)”. If she came over, she was presented with a few licks of the ice cream cone. The same was done with the commands “stand up” and “sit down”.

Three different items were used during the intervention for requesting. Teaching the child to use certain signs to say what she wanted was used. Another approach was laying out two pictures of items, one that the child likes, and one that the child doesn't like. The child then picked an item and whatever picture was chosen, that was what the child received. This technique helped to see if the child could decipher between what she liked and didn't like and could request what she wanted. One other device used during the intervention were two switches that had pictures on them and were voice activated. These pictures could be changed depending on the activity as well as the voice could be changed. The goal was to get the child to push the switch and have her make a choice as to what she wanted. Once again, whatever switch she pushed, that was the reinforcer she received.

The independent variable in this study is the behavior technique used which is applied behavior analysis. The dependent variable is the behavior of the child.

Testable Hypothesis:

Null Hypothesis : Using the behavior technique applied behavior analysis, there will be no significant difference in behavior from the results taken at baseline as compared to the results taken post reinforcement.

Alternate Hypothesis : Using the behavior technique applied behavior analysis, there will be a significant difference in behavior from the results taken at baseline as compared to the results taken post reinforcement.

Design:

The design for this study was a single subject design.

Analysis:

The analysis used for this study was a one way mixed analysis of variance (ANOVA). This analysis was appropriate because the study included one independent variable which was the behavior technique used and one dependent variable which was the measurement of the behavior.

Summary:

The subject used in this study was a two years and an eleven-month old female who was diagnosed with autism. In order to communicate, two behavior techniques were utilized, called applied behavior analysis and applied verbal behavior. In order for these techniques to be successful, reinforcers should be found that would help the child to comply. Specific commands were presented with the reinforcers. Data was collected and a one way mixed analysis of variance (ANOVA) was completed.

Chapter Four

Introduction:

In chapter four, the data was collected and a one way mixed analysis of variance (ANOVA) was completed in order to discuss the significance of the research. In order for the research to be statistically significant, $p < .001$. Also discussed in chapter four, will be whether the null hypothesis is rejected or accepted.

Restatement of Hypothesis:

Null Hypothesis : Using the behavior technique applied behavior analysis, there will be no significant difference in behavior from the results taken at baseline as compared to the results taken post reinforcement.

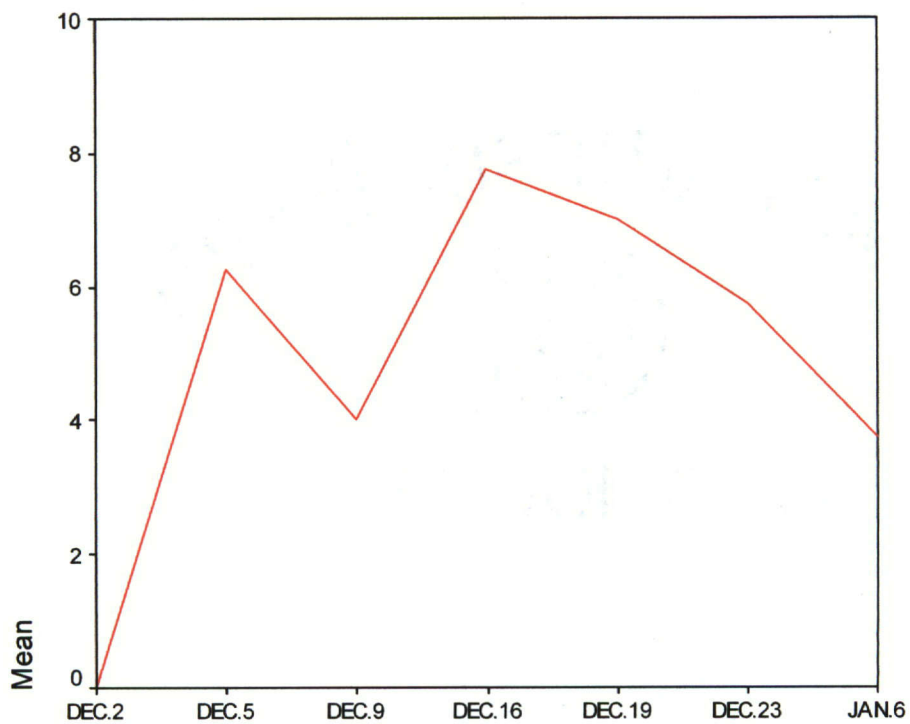
Alternate Hypothesis : Using the behavior technique applied behavior analysis, there will be a significant difference in behavior from the results taken at baseline as compared to the results taken post reinforcement.

Results:

According to the data collected, the behavior technique, applied behavior analysis did make a significant difference in the behavior of the child over time. Therefore the null hypothesis was rejected and the alternate hypothesis was accepted.

According to Figure 4.1, $F(1,3) = 85.121 \leq .003$, which concludes that the research in this study is statistically significant.

Figure 4.1 Graph of Applied Behavior Analysis Over a 5 Week Period



Over a seven week trial of using the behavior technique, applied behavior analysis, the subject's compliance rate continued to increase. When the post reinforcement data was compared with the baseline data, the results were statistically significant.

Summary:

In chapter four the null hypothesis was rejected and the alternate hypothesis accepted. The study was statistically significant and applied behavior analysis proved to be a successful behavior technique to use in order to increase compliance with a child with autism

Chapter Five

Introduction:

In the past few years, the number of cases of autism have been increasing. Many people have been focusing on the question of why instead of focusing on how to treat the people who already have this disorder. "Autism is diagnosed on the basis of abnormalities or impaired development in three areas: social interaction, communication, and a severely restricted repertoire of activity and interests, present before the age of three (American Psychiatric Association, 1994).

This study focuses on the need to help find a behavioral technique to increase compliance in order to increase communication with a child with autism. The hypothesis in this study was that by using the behavior technique, applied behavior analysis (ABA), compliance will increase with a child diagnosed with autism. A single-subject design was used. The subject was a two year and eleven month year old female diagnosed with autism who received numerous special services. The speech pathologist provided the applied behavior analysis which provided the data for this study. Over a five week period data was collected and using a one way mixed analysis of variance (ANOVA), the data was analyzed. The study was statistically significant.

Discussion:

Using the behavior technique applied behavior analysis, the child's compliance rate increased. On her first day when the baseline was taken and no reinforcements were used, she refused to do any of the behaviors asked of her. On the second week of using reinforcements, she refused to do one of the behaviors, regardless of the reinforcer that was provided for her. This skewed that data slightly, but the data was still significant at the end of the five weeks. The important idea to remember with this behavior technique is that the subject needs to like the reinforcer in order for the technique to be successful.

According to research, in order for applied behavior analysis to be successful, one or two behaviors should be worked on at a time. In this study, the specific behavior focused on was compliance. "Once the behavior is identified, intervention strategies are determined to suit the situation and, then, used to modify the behavior. During this time, the instructor provides reinforcement to elicit and maintain the desired behavior" (Schoen, 2003). For example, in this study, in order to get the subject to comply with a specific task that was asked of her, a desired reinforcement would be provided once the task was completed. When told to, "sit down", if the subject complied, the subject was provided with the desired reinforcement which usually was some form of food.

Children with autism often act out and are defiant because they have trouble communicating their needs and wants. "Problem behavior, a form of communicative expression that is typical for young disabilities, often remains in the communicative repertoire of the child with autism because it works for the child" (Buschbacher & Fox,

2003). Applied behavior analysis is beneficial because the technique helps the child to learn to ask properly for what they want as well as to communicate with others to the best of their abilities. The Picture Exchange Communication System (PECS), is a type of communication training program used with children diagnosed with autism. The child who participated in this study often had difficulty communicating with others and found the PEC system to be a successful way to request for items that she wanted and needed. The PEC system helped to increase compliance because part of the reason the child was non-compliant was because the child could not communicate. Being unable to communicate created a high level a frustration, which caused non-compliance among the child with autism.

This study supports the literature because from the data collected, applied behavior analysis was an effective method to use in order to increase compliance with a child with autism. “Applied behavior analysis has been reported by the Surgeon General of the United States to be the most effective way to treat autism” (Schoen, 2003).

Conclusion:

The findings in this study suggest that applied behavior analysis is successful in helping to increase compliance with a child with autism. Children with autism want to communicate, but have trouble saying what is on their mind. Applied behavior analysis teaches helps them to communicate appropriately. Applied behavior analysis has many subparts and it is important to remember that, how the technique is used, will depend on

who the child is, and how the technique will benefit that specific child.

Implications and Future Research:

Research has been done on the treatment of autism, but the research needs to be continued. People with autism will only benefit from more research. Better educational techniques and programs will help them to learn and to better communicate with others around them.

Applied behavior analysis will benefit children with autism if the program is added into the classroom. People with autism will be successful in life if given the same learning opportunities as others.

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Appendix A

Informed Consent

I hereby agree to allow my child to participate in a study project that is being conducted by psychology graduate student Rachael Simon under the supervision of Ann Simon, and her advisor Dr. Klanderman at Rowan University. The purpose of this study is to evaluate the technique Applied Behavior Analysis and see if compliance will increase with a child diagnosed with autism. It is hoped that the information derived from this study will help in the treatment for autism.

I understand this study will not effect my child's treatment time with Ann Simon and will incorporate strategies that Mrs. Simon would be utilizing even if the study were not being performed. Ann Simon will provide the behavior treatments while Ms. Simon will be recording the behavior.

The name of my child will not be used in any way or identified in any written results of the study. Confidentiality, name, and any other identifying information will be protected in any verbal discussion of the results as well.

I fully understand that my child's participation in this study can be withdrawn at anytime.

If I have any questions or problems concerning my participation in this study I may contact Ann Simon at (856) 424-0782, Dr. Klanderman at (856)256-4500 x3797, or Rachael Simon at (856) 751-6334.

Parent's or Guardian's Signature

Appendix B

Table 5.1: Data Collection: Number of Times A Behavior was Completed Out Of Ten Trials

Dec.2	Dec.5	Dec.9	Dec.16	Dec.19	Dec.23	Jan.6
.00	6.00	8.00	9.00	8.00	5.00	4.00
.00	9.00	.00	9.00	9.00	7.00	4.00
.00	5.00	5.00	7.00	7.00	6.00	3.00
.00	5.00	3.00	6.00	4.00	5.00	4.00

