



Concept attainment : a case study comparing a child profiled with Asperger Syndrome and his fifth grade classmates
by Marilyn Sue Hamilton

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor in Education in 'Education
Montana State University
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Abstract:

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During the second week of the investigation, all of the students in the classroom were instructed using the concept attainment method in spelling and math using oral instructions with an abstract visual cue for two days, oral instructions with visual answers for one day, and visual instructions with visual answers for one day. All of the students were pretested, post tested, and retested to determine immediate and/or long term changes in their responses. Follow-up interviews were conducted with parents and teachers to determine the impact of using the concept attainment model with the child identified as having Asperger Syndrome.

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Gains made on the pretest, post test, and retest could not be attributed to the presentation style of the model given the student's limited written language ability and difficulty attending to relevant stimuli. The visual/imagery method used in this study did not yield any results with the subject in the regular classroom but during one-on-one sessions, the child was able to organize his language more succinctly when directed through the visual/imagery approach.

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This dissertation has been read by each member of the dissertation committee and has been found to be satisfactory regarding content, English usage, format, citations, bibliographic style, and consistency, and is ready for submission to the College of Graduate Studies.

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ABSTRACT

This qualitative single subject case study investigated how the relationship of modifying a concept attainment model in a regular fifth grade classroom affected a child identified with Asperger Syndrome, a neurodevelopmental disorder, in relationship to his peers. The subject used in this study was an eleven-year-old male who had been previously profiled as possibly having Asperger Syndrome with a complete battery of psychological tests and a neurological evaluation.

Qualitative methods including field notes, interviews, videotapes, audiotapes, and electronic-mail were used for data collection. The subject and his peers were instructed using a visual presentation of the concept attainment model in spelling and math during the first week. Scores were recorded and the subject was given individual one-on-one instruction in a imagery/visualization method outside the classroom. During the second week of the investigation, all of the students in the classroom were instructed using the concept attainment method in spelling and math using oral instructions with an abstract visual cue for two days, oral instructions with visual answers for one day, and visual instructions with visual answers for one day. All of the students were pretested, post tested, and retested to determine immediate and/or long term changes in their responses. Follow-up interviews were conducted with parents and teachers to determine the impact of using the concept attainment model with the child identified as having Asperger Syndrome.

Results indicated that the child with Asperger Syndrome in this study generated fifty percent fewer written language responses than his same-aged peers when the modified concept attainment model was presented in the regular classroom setting. Gains made on the pretest, post test, and retest could not be attributed to the presentation style of the model given the student's limited written language ability and difficulty attending to relevant stimuli. The visual/imagery method used in this study did not yield any results with the subject in the regular classroom but during one-on-one sessions, the child was able to organize his language more succinctly when directed through the visual/imagery approach.

CHAPTER 1

INTRODUCTION

Asperger Syndrome is a neurodevelopmental disorder found in all nationalities throughout the world. Since its inclusion in the *Diagnostic and Statistical Manual of Mental Disorders Fourth Edition* (American Psychiatric Association, 1994) and the *International Classification of Diseases* (ICD-10) in 1992, interest in this low incidence disability has increased dramatically (Klin, Volkmar, & Sparrow, 2000). At this time, Asperger Syndrome (AS) is defined under Pervasive Developmental Disorders (PDD) in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV). Hyman, Rodier, and Davidson (2001) note that the increased interest in this disorder may be the result of dramatic changes in the diagnostic criteria for PDD over the last twenty years, an increase in public awareness of autism and related disorders, or the changes in the types and availability of therapeutic and education services for this population.

The diagnostic criteria for Asperger Syndrome (AS) includes qualitative impairments in social interactions as well as restricted repetitive and stereotyped patterns of behavior, interests, and activities. A clinically significant impairment in social, occupational, or other important areas of functioning must be present while no clinically significant delay in language development, cognitive development, the development of age-appropriate self-help skills, adaptive behavior, or curiosity about the environment in childhood is exhibited. The patient cannot meet the criteria for another specific Pervasive Developmental Disorder or Schizophrenia (Attwood, 1998). Because AS shares the triad of dysfunctions found in autism (i.e. communication,

social, and flexibility deficits), it has been considered to be an autistic spectrum disorder, which means that the symptoms manifested by this condition are on a continuum. Many consider low functioning individuals with autism to be on one end of the spectrum and high functioning individuals with autism or Asperger Syndrome to be on the other end. Research indicates that perhaps 20% of individuals with autism function in the normal or above-normal intellectual range cognitively (Klin, Volkmar, & Sparrow, 2000). Children with Asperger Syndrome are also considered to function within the normal or above-normal range of intelligence. Researchers and practitioners recognize that although the vast majority of students with Asperger Syndrome has average to above-average intellectual abilities and is included in general education classrooms, this group experiences academic problems (Myles & Southwick, 1999). Social and communication deficits along with concrete and literal thinking, poor problem-solving and organizational skills, as well as possible obsessive and narrowly defined interests, make learning and teaching difficult for these children and their general education teachers.

According to Myles and Simpson (1998), many students with AS learn information in a style which is incompatible with the way academic material is presented in educational environments. They speculate that students with Asperger Syndrome may possess average ability to process visual as well as auditory information but when asked to process both types of information concurrently, they cannot do so. This study presented information in a visual and oral format to a child with AS in a regular classroom setting to determine any effect.

Efforts to develop a better understanding and description of individual processing abilities in terms of information processing are not new to education. David Hunt and his associates developed a conceptual systems theory in the middle of the twentieth century which described human development as “an interactive function” of a person’s level of personality stage and the environmental conditions he encountered. The conceptual systems theory delegated individuals into four behavioral groups: low complexity, moderate complexity, moderately high complexity, and high complexity (Joyce, 1996) The best procedure for inducing an individual to progress toward complexity and flexibility was to match his/her present stage of personality development to an environment tailored to pull the individual toward the next stage of development.

Schroeder, Driver, and Streufert (1967) defined the low complexity level as black and white thinking, concrete, minimizing conflict, and preventing the individual from seeing “grays” or degrees. Moderate complexity was a move away from absolutism and characterized by the delineation of several ways of structuring the world. Moderately high complexity was the individual’s ability to see himself in other situations from another point of view and high complexity was a step further toward creating additional schemata in alternate ways. Hunt and his associates found that for optimal growth in complexity, the student needed to be exposed to an environment which matched the characteristics of his or her psychological world. An environment in which a highly complex individual would flourish would create unbearable stress for the person of low complexity. Asperger originally described his syndrome as a personality

abnormality. Social impairments, such as rigidity and literal thinking, which are observed in children, and adults, with AS may be linked with low complexity.

Current learning strategies based on brain research support the conceptual systems theory. Caine and Caine (1997) identify among the twelve brain/mind learning principles that the brain is a complex adaptive system, learning is developmental, and complex learning is enhanced by challenge and inhibited by threat. An emphasis on the development of metacognitive intelligence, the reflection on one's own processes, has become an integral aspect of teaching for the future. One of the methods developed by Joyce and Weil (1996) to enhance metacognitive learning is concept attainment, the acquisition of concepts and an analysis of the process. It has also been recommended by Sousa (2001a) as a strategy for enhancing thinking.

Persons with Asperger Syndrome may exhibit difficulty with problem solving if abstract concepts are involved. Categorization, concept formation, and concept attainment are important aspects of problem solving. Categorization is the organization of data, and concept formation is the way in which a vast amount of data is organized into various ideas. The concept attainment model requires a student to figure out the attributes of a category that is already formed in another person's mind by comparing and contrasting examples (called exemplars) that contain the characteristics (called attributes) of the concept with examples that do not contain those attributes (Joyce and Weil, 1996).

Statement of the Problem

In a recent article reviewing current research regarding Asperger Syndrome (AS), it is noted that "a significant challenge facing these individuals is their difficulty generalizing knowledge and skills" (Barnhill, 2001a, p.7). This characteristic is typical of disorders included along the autistic spectrum. Strategies used by children with autism were often idiosyncratic, limited, and stereotypic in nature.

One strategy thought to help integrate information for better generalization is the concept attainment model. The problem prompting the present qualitative study is how the relationship of the modification of a strategy used in a regular classroom setting affects the child identified with Asperger Syndrome. This study presented information through a structured concept attainment model first visually then orally in the classroom while providing the student with Asperger Syndrome the instruction of imagery/visualization as an additional strategy to enhance auditory problem solving.

Problem-solving skills, concepts and helpful behavioral routines are considered essential elements to be taught in an explicit and sometimes rote fashion using a parts-to-whole approach to children identified with Asperger Syndrome (Klin, Volkmar & Sparrow, 2000). Learning strategies, techniques, principles, or rules that aid in problem-solving, have been investigated for many years in the field of education for normally developing children as well as children with learning disabilities and developmental disabilities (Leon & Pepe, 1983; McCormick, Miller, & Pressley, 1989). The data collected through this study were intended to add to the literature regarding the difficulties in applying a specific strategy for children identified with Asperger

Syndrome.

The three phase model of concept attainment devised by Joyce and Weil (1996) involved the presentation of data and identification of concepts, testing attainment of the concept, and analysis of thinking strategies. Tennyson and Cocchiarella (1986) suggested that students develop procedural knowledge (how to attain concepts) with practice and the more procedural knowledge the students possess, the more effectively they attain and can apply conceptual knowledge. This model required students to compare positive and negative exemplars visually and orally, develop hypotheses, and readjust their hypotheses regarding new information through feedback from the teacher about their generated examples in order to analyze their thinking .

Purpose of the Study.

The purpose of this case study was to investigate the implementation of the concept attainment model using visual and auditory methods in the classroom as well as teach the child with Asperger Syndrome to use a visual imagery strategy as an aid in problem solving with auditory input. The study used exemplars written by regular classroom teachers and the researcher to be used in the regular classroom. The model was used in a regular classroom setting using visual presentation during the first week of instruction, and then the auditory presentation was employed during the second week of instruction.

In order to answer the research question, does visual and/or auditory presentation affect concept attainment in children identified with Asperger Syndrome, qualitative methods were used to determine the effect on the child identified with Asperger

Syndrome in the study. The subject, parents, and teachers were interviewed to determine what changes were observed during the study, how each person thought learning the concept attainment model affected the child, and if the child was performing better in the regular classroom. The subject was interviewed to determine if the visual/imagery method helped him during the second week of the study.

Questions to be Answered

1. Does training using visual and/or auditory presentation affect concept attainment in a child identified with Asperger Syndrome?
2. Can the visual/imagery concept attainment strategy taught to a child identified with Asperger Syndrome be generalized into the regular classroom setting?
3. How does using this intervention in the regular classroom affect teachers, parents, children in the classroom, and the subject identified with Asperger Syndrome?

Definition of Terms

Asperger Syndrome. (AS)- a neurodevelopmental disorder which follows the behavioral guidelines of the DSM-IV or ICD-10.

Children and adults with Asperger Syndrome may exhibit behaviors associated with other disorders which are unlike their peers. Some of those disorders are defined here:

Attention Deficit with Hyperactivity Disorder (ADHD)-a neurological disorder which manifests itself in lack of attention and hyperactivity. Many children and adults identified with Asperger Syndrome may also be diagnosed with ADHD (Attwood, 1998; Ghaziuddin, Weidner-Mikhail, & Ghaziuddin, 1998).

Theory of mind (ToMM)- the main way in which human beings are believed to make sense of actions in other animate beings (Baron-Cohen, 1997). Research indicates that most children with autism do not develop a theory of mind (Baron-Cohen, 1999).

Learning Disability (LD)- a chronic condition which has been presumed to have a neurological origin and results in an interference with development, integration, and/or demonstration of verbal and/or non-verbal activities (Feusahrens, 1992).

Effective approaches for intervention with students identified as having learning disabilities include testing, describing the learning strategy, modeling the strategy, verbal rehearsal of the strategy, practice with controlled activities, feedback, and practice using grade-appropriate activities (Deshler, Warner, Schumaker, & Alley, 1983). These approaches may also be considered effective with students identified with AS.

Testing- Testing involves establishing a baseline of student performance.

Describing the learning strategy- The teacher describes to the student the steps involved in the target strategy.

Modeling the strategy - The teacher can model the strategy by verbally stating the problem solving process in this study.

Verbal rehearsal of the strategy -The student verbally rehearses the steps involved in the strategy.

Practice with controlled activities - The student practices applying the strategy with appropriate instructional materials.

Feedback - As the student applies the strategy, the teacher gives the student both

positive and corrective feedback.

Practice with grade-appropriate activities - Students practice the strategy in the regular classroom setting.

Significance of the Study

Research on Asperger Syndrome is emerging. One of the reasons accounting for the emergence of AS related support organizations has been the perception of a void of services for and knowledge about more able children and adolescents with severe social disabilities (Klin, Volkmar, and Sparrow, 2000). These children often fall between two categories of service, learning disabilities and autism. This gap has led to a failure of schools to recognize the unique problems posed by this population and to deny services because these students seem to be too bright or appear to be doing well academically. Myles and Simpson (1998) noted that teachers often fail to acknowledge the special academic needs of students with AS because the children give the impression that they know more than they do. Their pedantic verbal abilities and perceived eccentricities have been considered curious rather than handicapping.

This case study conducted in a rural regular classroom setting was designed to add to the literature on children with AS in the public school environment. As with all developmental disabilities, each child with AS is unique and requires an individual treatment program. The unique education problems presented through this document are limited in their generalization to any other school environment.

Methodology

A qualitative single subject case study design was employed in this study. An eleven-year-old male enrolled in public school was used as the subject. The child was

selected for the study because he had been profiled as a child with Asperger Syndrome by a board certified neurologist, scored in the normal range of intelligence on the Wechsler Intelligence Scale for Children- III (WISC-III), and had a significantly low score on the arithmetic portion of this instrument.

Because this investigation was conducted in the classroom environment and employed a qualitative structure, it was considered a field-based study. "The normative quality of the work of research makes it especially potent when applied in schools because schools are designed to impose ideas and work patterns upon children" (Popkewitz, 1984, p.24). Jensen (1998) identified this type of research in education as the most reliable in interpreting brain research because it gives us testing results under actual, real-life conditions.

The child was instructed using a modified concept attainment model in the regular classroom along with his peers and a visual/imagery method as a support strategy in a one-on-one setting. Audiotapes, videotapes, and field notes were used to determine the effect of the strategy on the child in the classroom, the visual/imagery support strategy in isolation, and the perceptions of the parents and teachers involved in the study.

The motivation for this study was the increased interest in the identification of children in the public school environment with Asperger Syndrome. This study attempted to describe and analyze the performance of the child identified with AS in relationship to his peers when a new strategy was introduced in their classroom.

CHAPTER 2

REVIEW OF RELATED LITERATURE

Introduction

An issue in developing appropriate educational treatment programs for children identified with AS is that the criteria for defining the disorder are controversial.

Barnhill (2001a) suggests that “no universal agreement exists on the characteristics of AS”(p.3). The review of literature for this study was divided into five categories: (1) historical definition of AS, (2) clinical definition of AS, (3) current definition of AS, (4) educational implications, and (5) strategy instruction for children with other neurodevelopmental or processing disorders..

Historical Definition of AS

Asperger (1944), a Viennese physician, identified a group of children with a disorder he called autistic psychopathy in a published paper, “Autistic Psychopathy in Childhood.” The paper was translated into English in 1991 (Mayes, Calhoun, and Crites, 2001). The children he studied had deficits in academics, social integration, and behavior management. A year earlier, unknown to Asperger, Kanner (1943) identified a group of eleven children exhibiting similar characteristics as having early infantile autism. Kanner’s description became accepted in the English speaking community as the definition of autism but it was not until 1980 that it was formally recognized as a diagnosis (Klin, Volkmar, and Sparrow, 2000). Wing (1981) published a review of Asperger’s work reporting on thirty-four cases of individuals with similar histories and clinical presentations. It was Wing who proposed the label, Asperger Syndrome, in an

effort to avoid the term psychopathy. At that time psychopathy referred to sociopathic behavior rather than personality abnormality which had been Asperger's intent (Klin, Volkmar, and Sparrow, 2000). Wing's description varied slightly from Asperger's original case reports in the areas of language and creativity. She did not differentiate between AS and autism but indicated Van Krevelen (1971) agreed with Asperger that the two disorders should be considered different (Wing, 1981). Current researchers and practitioners have been challenged to identify and validate common characteristics found in this population.

Clinical Definition of AS

When Klin, Volkmar, and Sparrow (2000) reviewed six major sources for clinical criteria, fifty percent excluded autism from the clinical diagnosis (Asperger, 1944; Szatmari et al., 1989; DSM-IV, 1994) and fifty percent included autism as part of the diagnostic criteria (Gillberg and Gillberg, 1989; Tantam, 1988a; Wing, 1981). All six sources agreed on only one clinical characteristic: social impairment including poor nonverbal communication, poor empathy and failure to develop friendship (Klin, Volkmar, and Sparrow, 2000).

Prior to its inclusion in the DSM-IV, definitions of Asperger's Syndrome included impaired social interaction, restricted and repetitive behavior and interests, and communication impairment (Gillberg, 1985; Gillberg and Gillberg, 1989; Szatmari, 1991; Szatmari, Tuff, Finlayson and Bartolucci, 1990; Tantam, 1988a; Wing, 1981). There was little consensus about the differences between Asperger Syndrome and autism due to the varying and broad qualitative definitions determined by individual

researchers and clinicians (Mayes, Calhoun, and Crites, 2001). References to the two disorders included Asperger Syndrome as on the autism spectrum or continuum (Klin, 1994; Wing, 1986). High functioning autism was also used to describe the syndrome (Schopler, 1985; Szatmari, Bartolucci, and Bremner, 1989).

After the inclusion of the Asperger Syndrome in the ICD-10 (World Health Organization, 1992), it was considered for inclusion in the DSM-IV. The criteria for the DSM-IV differed from previous literature in that it did not specify that individuals with Asperger's disorder were less socially impaired than individuals with autism. The DSM-IV's definition for social impairment criteria for Asperger Syndrome and autism are the same. The DSM-IV also did not include communication impairment as a symptom of the disorder and included absence of significant cognitive delay and language delay to the criteria (Mayes, Calhoun, and Crites, 2001). This difference in definition continues to cause controversy among researchers and clinicians.

Current Definition of AS

Despite the DSM-IV's definition, researchers continue to describe individuals with Asperger Syndrome as being less severely affected than individuals with autism (Eisenmajer et al., 1996; Szatmari, 1991). Speech and language delays as well as gross motor impairments are still considered questionable (Eisenmajer et al., 1996; Manjiviona & Prior, 1995).

Wing consistently argues that AS should not be considered a separate entity from autism (Klin, Volkmar & Sparrow 2000). In clinical studies over the last ten years, information has been collected on nearly 700 children and adults with autistic

spectrum disorders. The conclusions of these studies indicate that (1) any of the features described by Kanner can occur in individuals who fit under Asperger's description, (2) the clinical picture of these individuals changes with age, and (3) different types of autistic spectrum disorders can be found within one family (Klin, Volkmar, & Sparrow, 2000).

Several studies have questioned the possibility of diagnosing Asperger Syndrome clinically (Eisenmajer et al., 1996; Manjiviona and Prior, 1995; Szatmari, 1991; Mayes, Calhoun, and Crites, 2001). In a study of 157 children with clinical diagnoses of autism or Asperger's disorder, all children diagnosed with AS were included in the DSM-IV's definition of autism (Mayes, Calhoun, and Crites, 2001). The authors concluded that it would be unlikely or impossible to differentiate the diagnosis of AS using the DSM-IV's criteria.

Educational Implications

A recent study conducted by the Asperger Syndrome Project at the University of Kansas provided a series of studies which are the first of their kind to be published regarding the characteristics of Asperger Syndrome. This collection of studies using between 16 and 42 subjects identified with AS produced the following characteristics: Intelligence which is similar to the general population's, ranging from Intellectually Deficient to Very Superior; a significant differentiation between written and oral language skills; limited ability to problem solve, which is in marked contrast to their verbalizations; grade-appropriate word calling with problems in inferential comprehension; pronounced emotional difficulties recognized by parents and teachers

but not acknowledged by the students themselves; attributions that resemble a learned helplessness approach; and sensory problems similar to persons who function cognitively at a much lower level (Barnhill, 2001b). Previously, Barnhill (2001a) had identified essential features in AS which included social impairments, communication impairments, and restricted range of interests and rigidity. She also included motor clumsiness, emotional difficulties, sensory characteristics, and academic difficulties as characteristics.

Emotional difficulties have been documented in terms of adolescents and young adults with AS regarding depression and anxiety (Attwood, 1998; Ghaziuddin, Weidner-Mikhail, and Ghaziuddin, 1998; Gillberg, 1985; Tantam, 1988b; Wing, 1981). Among half of Ghaziuddin's participants with AS, there was an additional psychiatric diagnosis at the time of evaluation. Attention Deficit Hyperactivity Disorder was the most common diagnosis for children while adolescents and adults exhibited depression.

Peculiar sensory responses have been observed in children diagnosed with AS (Church, Alisanski, and Amanullah, 2000; Myles and Simpson, 1998). Frequently, there is a heightened or over-exaggerated response to touch and an intolerance to bright or flickering lights (Barnhill, 2001a). Children with AS may demonstrate academic difficulties because they lack higher level thinking and comprehension skills. They tend to be very literal in their interpretations as well as factual (Williams, 2001). These students struggle in their ability to generalize knowledge and skills. They often have difficulty applying information and skills across settings and with different individuals (Myles and Simpson, 1998). This failure to apply knowledge and skills may be linked

to poor processing abilities. "Many students with AS learn and process information in a style that is generally incompatible with the way academic material is presented in many classrooms" (Myles and Simpson, 1998, p. 47). Although they may have at least average abilities to process visual and auditory information, children with AS may have difficulty processing both types of information at the same time.

In the past, the term learning disability referred to a learning problem that was caused by disorders in the psychological processes (LD Summit, 2001). These disorders have been considered to result from a dysfunction of the central nervous system. There has been, however, little consensus about the deficient processes or how to measure them. For the purpose of this study, the qualities found in effective strategies for children diagnosed with learning disabilities and autism will be considered viable for children diagnosed with AS.

Strategy Instruction

Successful students learn about themselves and their learning through academic experiences. Students with processing deficits seem to profit less from their academic experiences. Consistent failure does not provide information about what the learning disabled learner should do strategically to ensure success. Without appropriate strategy reinforcement, learning disabled learners become convinced that nothing they do will change their academic fate (McCormick, Miller, and Pressley, 1989). This situation leads to poor motivation and attention which in turn continues the cycle of failure.

Dale Schunk (1983) and colleagues demonstrated the benefits of training students to approach tasks strategically. Schunk trained math-disabled students to set

small, easily attainable goals and administer self-rewards. Learning to approach tasks strategically improved student expectations, perceived self-efficacy, and math skills. Similar findings were obtained from a study designed to train LD adolescents to set realistic goals (Tollefson, Tracey, Johnson, Farmer, and Buenning, 1984).

Research indicates that simply teaching cognitive skills will not alter the profile of the LD student. Teaching only metacognitive strategies and changing attributional profiles may produce short term gains, but long term significance needs continued research (McCormick, Miller, & Pressley, 1989). Currently, the most effective programs for students with learning disabilities are those designed to improve all three domains (cognitive, metacognitive, and motivational) simultaneously (Arbitman-Smith & Haywood, 1980; Deshler, Warner, Schumaker, and Alley, 1983). The strategy used for this study has attempted to employ cognitive, metacognitive, and motivational aspects.

Simpson and Regan (1986) identified three common characteristics among children with autism which differentiated them from other learners: stimulus overselectivity, diminished motivation, and self-stimulatory responses. All three of these characteristics may also be seen in children with Asperger Syndrome.

Stimulus overselectivity is the limited consideration of environmental stimuli (Dunlap & Koegel, 1981; Lovaas, Schreibman and Koegel, 1974). Generalization of learned responses is often inhibited in children with autism due to stimulus overselectivity (Bock, 1990). Rincover and Koegel (1975) reported the failure of four out of ten children with autism to generalize a response learned in one setting to another

setting. Conclusions from this study indicated that the failure of the children to generalize was due to a continued reliance upon irrelevant stimuli as prompts.

Diminished motivation in children with autism is characterized by a tendency to impose rigid routines on all activities. This results in an unwillingness to investigate new environments, develop new areas of interest, or learn alternative responses to environmental stimuli (Bock, 1990). Diminished motivation reduces the number of correct response elicited which results in a weak association between correct responses and reinforcers (Koegel & Egel, 1979). Koegel and Egel (1979) investigated the influence of correct versus incorrect task completion on the motivation of children with autism to respond to instructional activities. They concluded from their study that the learning characteristics of children with autism may result in few or inconsistent reinforcement opportunities resulting in decreased motivation, but treatment procedures designed to keep children responding until they complete a task may result in increased motivation through reinforced perseverance.

Self-stimulatory responses are repetitive, stereotyped, idiosyncratic motor behaviors which appear to have no functional relationship with the environment (Lovaas, 1981). Dunlap, Dyer and Koegel (1983) conducted a study investigating the relationship of short versus long intertrial intervals to correct responses and self-stimulatory behaviors in children with autism. Given any child/task combination, short intertrial intervals produced decreased levels of self-stimulatory responding and increased levels of correct responding (Bock, 1990).

Intervention has been found effective in treating some of the core learning

deficits exhibited by children with autism. These interventions, or learned responses, are limited only if they cannot be generalized and maintained. Research indicates that learned responses by children with autism can be enhanced by (1) the use of functional reinforcers to train the targeted responses, (2) use of multiple therapists to train the targeted responses, and (3) training the targeted responses in a number of settings (Bock, 1990) The methodology used in this study attempted to incorporate these procedures.

Strategic training for children with autism has been documented by Bock (1990, 1999). Bock investigated the effects of categorization strategy training on the performance of four children with autism. Three of the four children generalized use of the strategy to sorting activities involving unrelated, untrained sorting items. In 1999, the study was extended to include (a) the use of authentic sorting activities for categorization strategy training, (b) the use of both low and high-functioning children with autism, and (c) the assessment of categorization strategy generalizations across multiple settings using untrained sorting items and different teachers (Bock, 1999). The data indicated that both high and low functioning children with autism could benefit from categorization strategy training; however, because participants did not receive strategy training across a set of natural settings, the potential correlation between learning strategy generalization, maintenance, and general case instruction remained unclear and warranted further research.

The review of literature supports the difficulty in diagnosing and treating the AS population. While there continues to be controversy regarding the differences between

autism and AS, children are being diagnosed with this disorder without the benefit of appropriate educational placements or programs. What effect, visual and/or oral strategic instruction, would produce on the subject was the intent of this investigation.

CHAPTER 3

METHODOLOGY

Introduction

The purpose of this case study was to investigate the implementation of the concept attainment model using visual and auditory methods in the classroom as well as teaching the child with Asperger Syndrome to use the imagery/visualization as an aid in problem solving with auditory input.

Research Design

This study employed a qualitative single subject case study design. The purpose of a single subject design is to clearly establish the effects of an intervention on a single individual (Neuman and McCormick, 1995). A qualitative case study provides a dynamic holistic description and analysis of a single phenomenon or social unit (Merriam, 1988). "Single subject research is by its very nature personal and individualized, which in turn lends itself to qualitative research procedures" (Richards, Taylor, Ramasamy, and Richards, 1999, p. 285). Denzin and Lincoln (1994) state that qualitative researchers investigate events in their natural settings, and attempt to interpret phenomena in terms of the meanings that the people involved place on them. In qualitative research, the experiences and reactions of the individual researcher as well as other participants, including the individual subject, are very important.

McWilliam (1991) identified several guidelines for qualitative single subject research. He noted that a sufficient amount of time needed to be arranged for adequate information gathering in order to accurately interpret qualitative data. The investigator,

too, must be involved in the study and familiar with the individuals who are subjects, as well as those who may be involved in collecting data and applying the treatment variable, and those whose lives may be affected by the outcomes, such as the family. McWilliam also suggested that if the researcher is distant, he or she might be unable to relate certain interpretations by others. The researcher must be prepared to collect data on variables that are unexpected as the study develops. Burgess (1985) characterized qualitative research by its flexibility and the fact that studies could be designed and redesigned.

The study of a culture, like the classroom, "provides the framework for examining what the child knows and how the child processes information and responds to cues in the environment, but equally significant, it also provides the framework for examining how teachers process information concerning learner attributes, cognitive behaviors, and emotional signals" (Wolf & Tymitz, 1977, p.9). A qualitative single subject case design was chosen for this study because Asperger Syndrome is considered a low incidence disability. Only three students in this small rural school district of 958 had been medically diagnosed with Asperger Syndrome. Given the time period for the study and the involvement of the regular classroom population, only one of the families chose to be involved in the study.

This particular case study is considered a bounded system. Bounded systems are those in which the limits, or bounds, have a sense of obviousness such as an individual teacher or a single school. Creswell (1998) suggested bounded systems were bounded by time and place. Devons and Gluckman (1982) referred to bounded systems as

