# Autism Programs in the Commonwealth of Virginia: From Theory to Practice

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ABSTRACT

Educational law did not recognize autism as a disability category until the passage of *The Education for all Handicapped Children Act* (Public Law 101-476) in 1990. More recently, in 2005 the federal government issued a report from the United States Government Accountability Office (GAO) detailing rising prevalence, expenditures that exceed general education per pupil spending, and multiple educational services. Furthermore, the Virginia Department of Education created an ad hoc committee to study autism in the Commonwealth. Therefore, the study sought to answer: (1) What programs are being used in the Commonwealth of Virginia to serve children identified with the educational disability label of autism? (2) What is the degree of effectiveness of these programs as perceived by directors of special education? and (3) Do selected demographics of the school division influence the types of programs that are delivered? A survey instrument was used to answer the research questions. The data were analyzed using the *Statistical Package for the Social Sciences* 14.0 (SPSS 14.0) resulting in descriptive statistics and One-Way ANOVA with post hoc Multicomparison.

Analysis revealed that 48.4% of school divisions responding primarily rely on traditional special education to serve children with autism. Post hoc testing revealed that the mean score for school divisions using a combination of specially designed programs ($M$ = 3.38) were statistically significantly different from the mean score of school divisions that primarily use traditional special education services ($M$ = 2.9).The results of this study may be used to promote the use of specially designed programs for children with autism in school divisions in the

commonwealth of Virginia and focus training for school divisions that serve metro, urban, and rural areas.

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# Chapter I

## INTRODUCTION

On May 6, 2002, *TIME* carried a front page cover-story titled, *Inside the World of Autism*, citing that more than one million Americans may have autism. The reporter elaborated on the anguish of a family attempting to raise twins with severe autism. The twins had difficulty with simple social interaction, communication, and interaction with peers appropriately (Nash, p.48).

In a February 28th article published by *Newsweek*, Claudia Kalb detailed how two parents provided neurofeedback, interacted with dolphins, gluten-free diets, replaced carpet with toxin-free flooring, and purchased a special water purifying system to help their child with autism. Kalb continued to expound on current research being conducted to find the cause of autism and leads on cures, whether medicinal or homeopathic in nature (Kalb, 2005).

On May 15, 2006, *TIME* revisited the topic of autism in two articles entitled *Inside the Autistic Mind* and *A Tale of Two Schools* by Cladia Wallis. Wallis (2006) discussed in the first article parents' emotional sojourn to help their daughter who demonstrated characteristics of autism and in the second article she compared various approaches that focused upon behavior and relationships. While newsmagazines seek to capture a reader's attention and provide anecdotal stories, researchers seek solutions to questions through rigorous scientific method.

Leo Kanner, an Austrian-American psychiatrist, is attributed with the discovery of autism. He expanded on the work of Jean Marc Gaspard Itard (1801), M. W. Barr (1898), and Eugen Bleuler (1912) who were among the first to describe autism-like characteristics. In a 1943 report by Kanner, *Autistic Disturbances of Affective Contact,* he presented eleven case studies of eight boys and three girls with "unique 'syndrome' not heretofore reported, which seems to be

rare enough, yet is probably more frequent than is indicated by the paucity of observed cases" (p. 242). His initial description of autism is as follows:

> There is from the start an *extreme autistic aloneness* that, whenever possible, disregards, ignores, shuts out anything that comes to the child from the outside. Direct physical contact or such motion or noise as threatens to disrupt the aloneness is either treated 'as if it weren't there' or, if this is no longer sufficient, resented painfully as distressing interference" (p. 242).

He continued to describe that in these children there appeared to be the lack of anticipation, speech, communication, echolalia, literalness, difficulty eating, repetition of behavior, difficulty relating to people, and a fascination with objects. Other shared characteristics included good *cognitive potentialities, serious-mindedness,* with all the children being physically normal, and all come from highly intelligent families. It may be of interest that 8 of the families Kanner studied had been mentioned in *Who's Who in America* or in *American Men of Science* (p 248.)

The following year, Australian Hans Asperger published *Die autischen Psychopathen im Kindesalter,* in the journal *Archiv Für Psychiatrie und Nervenkrankenheiten* (1944/1991). Asperger refered considerably to Eugen Bleuler who coined the term *autistic* to refer to someone who "shows a lack of initiative, aimlessness, neglect of reality, distractedness, but also impulsive, and bizarre behavior." However, it should be noted that Bleuler used the term *autistic* loosely and not specific to children whom demonstrated a set of specific symptomolgy that Kanner and Asperger described (1991, p. 38). Within Asperger's case studies, he observed autism almost exclusively in males. He noted that autism appeared to be an "extreme variant of male intelligence," and that adults with autism fulfilled a place within society, needed

specialized teaching to focus upon strengths and weaknesses, had difficulty with social integration, and engaged in stereotypic behavior (p.84).

More currently, the web site for the Center for Disease Control (CDC) cites Blaxill (2004) with prevalence of autism spectrum disorder 1 in 166. Blaxill continues to illuminate that reports that understate rising trends (Fombonne, 2003; Gillberg & Wing, 1999; Wing, & Potter, 2002) have "overemphasized unimportant methodological problem, employed flawed meta-analytic methods, and failed to take into account the most relevant biases in survey methodologies" (p. 549).

While the medical and psychiatric community was seeking to identify and treat autism in the 1940s and 1950s, the field of education had a later start. Public Law 94-142, *The Education for All Handicapped Children Act of 1975,* was the beginning of special education funding and included terms such as *free appropriate public education* and *due process.* However, it was not until 1990 with the *Individuals with Disabilities Education Act* (P. L. 101-476) that autism was defined in education as a disability category. These laws created a core vocabulary from which administrators, educators, and families could share.

Additional interest came in 2005 from the United States Government Accountability Office (GAO). The mission of the GAO is as follows:

> The Government Accountability Office, the audit, evaluation and investigative arm of Congress, exists to support Congress in meeting its constitutional responsibilities and to help improve the performance and accountability of the federal government for the American people. GAO examines the use of public funds; evaluates federal programs and policies; and provides analyses, recommendations, and other assistance to help Congress make informed oversight, policy and funding decisions. GAO's commitment to good

government is reflected in its core values of accountability, integrity, and reliability. The interest of the GAO into autism services in schools yielded a report written by Marnie Shaul, Director, Education, Workforce, and Income Security Issues. She issued the report to the chairman and ranking minority member of the subcommittee on Human Rights and Wellness and the Committee on Government Reform of the House of Representatives. The report asked the following questions:

1) What is the trend in numbers of children with autism receiving services under Individuals with Disabilities Education Act?
2) What services are provided in educating these children?
3) What are the estimated per pupil expenditures for educating children with autism in public schools?
4) What approaches are used in educating children with autism?

The answers were based upon data from the Department of Education, Special Education Expenditure Project (SEEP), Office of Special Education Programs (OSEP), and the National Research Council (2001). Results indicated that there was a 1) 500 percent increase in children served under IDEA; 2) speech therapy, physical therapy, and other special education services were provided based upon needs; 3) average expenditure for a child with autism was more than $18,000, three times the average per pupil expenditure; and 4) educational approaches include early intervention, intensive instructional programming, repeated teaching in small groups, a family component, and ongoing evaluation. Although a list of services were provided indicating access to special education, the report did not identify programs that are used to serve children with autism, to what degree the programs were successful, nor did it mention how success was measured by state educational agencies. Moreover, the report did not detail whether services

were being provided universally to all children with autism or whether geographic location, local expenditures on education, or school district resources influenced the type of services rendered.

States are also concerned about the special education services to children with autism. This is characterized by the recent Virginia Special Education Advisory Council's inquiry and open forum about the current educational services available, or lack thereof, to families of children with autism in the Commonwealth (January 20, 2005). This meeting allowed for families across Virginia to share concerns and frustrations to the Virginia Special Education Advisory Council in order to illuminate challenges for families of children with autism. An ad hoc subcommittee on autism was then created to study current and future concerns and to make recommendations (April 14-15, 2005). This ad hoc committee demonstrates the continued need for the study of autism in education and to find real-life solutions to assist school divisions and families.

## Purpose of the Study

In light of the GAO federal report and the current context at the state level, the purpose of this inquiry is to investigate the extent to which specially designed programs for children with autism are being used to provide effective instruction in the Commonwealth of Virginia.

## Research Questions

(1) What programs are being used in the Commonwealth of Virginia to serve children identified with the educational disability label of autism?

(2) What is the degree of effectiveness of these programs as perceived by directors of special education?

(3) Do selected demographics of the school division influence the types of programs that are delivered?

## Definitions

What is autism? This question may seem simple; however, there is often confusion for families and educational personnel. A psychologist, physician, or an individual that works in the medical community, will refer to the Diagnostic Statistical Manual-IV-TR of Mental Disorders (DSM-IV-TR) (American Psychological Association, 2004). This manual provides guidance on diagnosis, etiology, and treatment. Conversely, educators do not adhere to the DSM-IV-TR. The educational profession uses state and federal regulations in order to label a child disabled and make them eligible to special education services (*34 CFR § 300.306)*. Therefore, a child may receive a medical diagnosis of autism, but may not qualify for special education services under the educational disability label of autism if their academic performance is not adversely affected (34 CFR § *300.8(c)(1)(i)(ii).*

For the purpose of this inquiry, autism is "a developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age three, that adversely affects a child's educational performance" (*34 CFR § 300.8(c)(1)(i)(ii)*.

*Programming* refers to specially designed instruction for children with autism spectrum disorders. This implies that a systematic instructional protocol is followed for the delivery of services. This instructional protocol may include specific methodological strategies (i.e. discrete trials), curriculum (i.e. adaptive skills training), and a hierarchy of contexts to generalize skills (i.e. home, school, community).

*Traditional special education* refers to instructional practices that are used for children with various disabilities.

*Diverse programming* or *combination of programs* refers to the use of two or more specially designed programs for children with autism.

## Significance of the Findings

This study will add to the current body of research on autism and educational services. It will provide a map of how the pedagogy at the university reflects in practice in the educational setting for children with autism and this study will describe how children with autism are being served, what programs are used, and where the programs are located. This study will provide information on how directors of special education measure effectiveness for these programs and whether current programs are being perceived as successful. Lastly, the demographic data of the counties that school divisions serve will be examined and discussed.

Stakeholders such as parents, teachers, directors of special education, superintendents, and policy makers will be provided current data that will enable them to chart future directions in programming and training to increase effectiveness of programs and service delivery models for children and families dealing with autism.

## Limitations of the Study

Given the research questions, the scope of this study is limited to public day schools within the Commonwealth of Virginia. The respondents to the survey are limited to directors of special education or equivalents. The rationale for having directors of special education include their: 1) direct accountability to the superintendent for special education services within the school division; 2) specialized training in special education, special education law, and individualized education program development; and 3) administrative training in program evaluation, formative and summative evaluation. Additionally, the present study is limited to the areas of programming, effectiveness, and the relationship of school demographics. This study does not include fiscal expenditures for autism, personnel development and training for autism, or vocational training for children with autism.

# Chapter 2

## REVIEW OF LITERATURE

The purpose of this inquiry is to investigate the extent to which specially designed programs for children with autism are being used to provide effective instruction in the Commonwealth of Virginia. The following review of literature presents researched programs topically, chronologically, with each study building upon prior empirical evidence.

*Applied Behavior Analysis (ABA).* ABA refers to a specific program tailored for children with autism primarily introduced in the literature by O. Ivar Lovaas (1987) from the University of California, Los Angeles with subsequent supportive reports from McEachin, Smith, & Lovass (1993), Howard, Sparkman, Cohen, Green, and Stanislaw (2005), and Cohen, Amerine-Dickens, and Smith (2006). Lovaas (1987) study reported on:

> A behavioral-intervention project that sought to maximize behavioral treatment gains by treating autistic children during most of their waking hours for many years. Treatment included all significant persons in all significant environments. Furthermore, the project focused on very young autistic children because it was assumed that younger children would be less likely to discriminate between environments and therefore more likely to generalize and to maintain then treatment gains. Finally, it was assumed that it would be easier to successfully mainstream a very young autistic child into preschool than it would be to mainstream an older autistic child into primary school (p. 3).

In his initial study, Lovaas hypothesized that by first grade children who had received intense treatment across various environments would *catch up*.

The subjects of Lovaas (1987) study were randomly assigned to an experimental group

($n$ = 19), control group 1 ($n$ = 19), and control group 2 ($n$ = 21) when possible. Parent protest, staffing, and driving distance to the clinic affected the assignments; therefore, true randomization was not completed. The subjects had all been diagnosed with autism, were less than 46 months in chronological age, and had a mental age of 11 months or more by age of 30 months. The experimental group received 40 hours of one-to-one treatment while control group one received 10 hours or less of one-to-one treatment. Control group two received traditional services not associated with the completed study for an unspecified amount of time. The experimental group and control group 1 received treatments at home, school, and community for 2 or more years. Parents were trained and treatment could be completed 365 days a year. Strategies used included the reinforcement of positive behaviors and discrimination learning. The use of time out, ignoring, shaping, saying "no" loudly or a slap on the thigh was used to deter self-stimulatory and aggressive behavior. With regard to curriculum, goals focused upon reducing self-stimulatory behavior, requesting, imitation, play, and carryover, expressive/abstract language, interaction with peers, emotions, and preacademic tasks.

A MANOVA was used to analyze differences at the beginning of the study. Results indicated no significant differences between the groups except that the control groups were 6 months older chronologically than the experimental group. Post testing using MANOVA revealed that the experimental group did significantly better in educational placement ($p < .001$) and IQ ($p < .01$). Lovaas reported that 9 of the 19 children passed a public day school general education first-grade class and had an average or above average IQ after treatment. Critical review reveals that true random sampling and assignment were not completed threatening internal and external validity, parental involvement of the control groups is not addressed, and the use of physical punishers raises possible ethical concerns in today's society.

McEachin, Smith, and Lovaas (1993) completed a follow-up study to Lovaas (1987) study. The goal of McEachin et al. (1993) was to determine if the experimental group of children with autism in Lovaas' (1987) study had maintained reported gains in comparison to control group one of children with autism. Special emphasis was placed upon the nine students who had reportedly achieved at least average intelligence and had passed first-grade in a general education class without paraeducator support. The mean chronological age of the experimental group for the present study under discussion was 13 years. Intensive behavioral treatment had ceased for the nine students earlier reported ($M$ = 5 years), the remaining students had continued to receive treatment at parents' request until desired levels were reached ($M$ = 5 years). The mean age for subjects in the control group was 10 years with mean time for cessation of services 3 years. Pearson correlations were completed to determine if order of assignment had a relationship to intake/outtake IQ. Results indicated no likely relationship.

All students were assessed based upon educational placement, performance on the *Wechsler Intelligence Scale for Children-Revised* (Wechsler, 1974*), The Vineland Adaptive Behavioral Scales* (VABS) (Sparrow, Balla, & Cicchetti, 1984), and the *Personality Inventory for Children* (Wirt, Lachar, Lkinedist, & Seat, 1977). According to McEachin et al. (1993), the tests were to measure intelligence, social skills, and emotional functioning. Students were tested from outside agencies, school personnel, and project staff. Results indicated that the proportion of students who had achieved general education placement had maintained that placement (9:19). For the control group, one student had achieved general education placement (1:19) with statistical significance $x^2$ (1, $n$ = 38) = 1905, $p < .05$. The experimental group also achieved and maintained a statistically significant higher IQ, $t$ (35) = 2.97, $p < .05$. For maladaptive behavior, the control group was statistically significant, $t$ (31) = 2.39, $p < .05$. For personality, the mean

scores did not yield statistical significance; however, there was statistical significance when comparing group and the individual scores, $F$ (15, 390) = 2.36, $p < .01$, on the psychosis scale. Tukey test for multicomparison was used. Based upon the results, McEachin et al. (1993) concluded that the experimental group had maintained the general gains achieved in educational placement, IQ, and adaptive behavior when compared to the control group from the Lovaas (1987) study.

Howard, Sparkman, Cohen, Green, and Stanislaw (2005) conducted a study to compare three treatment approaches and to determine if there were any significant differences in the children post treatment. The three treatment approaches were: (1) an intensive applied behavioral approach (ABA; 1:1, adult: child ratio, 25-40 hours per week), (2) eclectic intervention (1:1, or 1:2 ratio, 30 hours per week), or (3) a non-intensive public early intervention program (small groups, 15 hours per week).

There were 61 participants within the study that were selected based upon geographic region and identification as having autism through a local educational agency (LEA) or non-profit center. The participants must have been in an early intervention program before 48 months of age, previously received less than 100 hours of intervention, speak English only, and have no other medical condition.

The subjects were not randomly assigned to the three treatment approaches, but were assigned to treatment based upon Individualized Educational Programs (IEP) or Individualized Family Service Plans (IFSP). It should be noted that random selection and random assignment did not occur due to the limits of geographical region, as well as, random assignment did not occur. The parents of the children who participated in the intensive behavioral group had one to two more years, on-average, of college education than those in the other treatment groups.

Howard et al. (2005) stated that educational differences were “controlled for in subsequent analyses” (p. 365). Educational rates of mothers and fathers were coded as variables in analysis and multiple regression was used to analyze the data. In considering procedural integrity, observation, interviews, and descriptions were obtained.

The intensive behavioral program used applied behavior analysis with the use of discrete trials. Children under the age of three received 25-30 hours of intensive treatment, one-on-one, while children older than three received 35-40 hours of treatment. Treatment took place within the home, school, and in community settings supervised by a Board Certified Behavior Analyst. Skill generalization, discrete trials, fading of prompts, use of reinforcers, and sequential skill instruction were components of the intensive behavior analytic treatment.

The Autism Educational Programming (AP) was identified as a comparison group (group two). The AP group had a ratio of one-to-one or one-to-two. Twenty-five to 30 hours of intervention took place each week within a special education classroom. The use of discrete trials, Picture Exchange Communication System, sensory integration, and the Treatment and Education of Autistic and Communication Handicapped Children(TEACCH) model were employed. A special education teacher directed paraprofessionals in the implementation of this program. The generic educational programming (GP) was also identified as a comparison group. These children were served in local community special education classrooms or as classrooms for the communication handicapped. Children with a variety of disabilities were present at each facility with an average of 15 hours of intervention each week. The ratio of adult to children was one-to-six. This intervention focused upon developmentally appropriate activities with exposure to plan, language, and sensory.

Children were measured pre and post-treatment on cognition, non-verbal skills, receptive language, expressive language, communication, self-help, social, motor, and a composite score. Pre-treatment, the measures for all children were similar with only non-verbal skills being statistically significantly higher for the GP group. Cognitive skills were measured utilizing the *Bayley Scales of Infant Development-Second Edition* (BSID-II) (Bayley, 1993), the *Wechsler Primary Preschool Scales of Intelligence-Revised* (WPPSI-R) (Wechsler, 1989), the *Developmental Profile-II* (DP-II) (Alpern, Boll, & Shearer, 1986), the *Stanford Binet Intelligence Scale, Fourth Edition* (Thorndike, Hagen, Sattler, & 1986), *Differential Abilities Scale* (DAS) (Elliott, 1990), *Developmental Assessment of Young Children* (DAYC) (Voress & Maddox, 1998), and the *Psychoeducational Profile-Revised* (PEP-R) (Schopler, Reichler, Bashford, Lansing & Marcus, 1990). Post-treatment, children were tested using the previously mentioned tests; however, it could not be determined which participants were given which tests. Also, two children were identified as untestable. Non-verbal skills were tested using the *Merrill-Palmer Scale of Mental Tests* (Stutsman, 1948), the *Standford-Binet* (Thorndike, Hagen, & Sattler, 1986), and the *Leiter International Performance Scale-Revised (*Roid & Miller, 1997). Receptive and expressive language was tested using the *Reynell Developmental Language Scales* (Reynell & Gruber, 1990), *Rossetti Infant-Toddler Langauge Scale (*Rossetti, 1990), the *Receptive-Expressive Emergent Langauge Scales-Revised* (REEL-2) (Bzoch & League, 1991), the *Preschool Langauge Scale-3* (PLS-3) (Zimmerman, Steiner, & Pond, 1992), the *Infant-Toddler Developmental Assessment* (Provence, Ericksen, Vater, & Palmeri, 1985) the *Peabody Picture Vocabulary Test-3rd Edition* (Dunn & Dunn, 1997) with the *Expressive Vocabulary Test* (Williams, 1997), *Sequenced Inventory of Communication Development-Revised Edition* (SICD-R) (Hedrick, Prather, & Tobin, 1984), the *Expressive One-Word Picture Vocabulary Test*

(EOWPVT) (Brownell, 2000) and the *Receptive One-Word Picture Vocabulary Test* (ROWPVT) (Brownell, 2000).

One child did not receive pre-assessment and six children did not receive post-assessment. Adaptive skills were analyzed with the *Vineland Adaptive Behavior Scales: Interview Edition* (Sparrow, Balla, & Cicchetti, 1984), subscales of the *Denver Developmental Screening Test II* (Frankenburg, Dodds, Archer, Shapiro, & Bresnick, 1992), and the *Rockford Infant Development Evaluation Scales* (Project RHISE, 1979). Two children were not pre-assessed while six children were not post-assessed. T-tests were not employed due to the limitation of only allowing group scores to be considered; therefore, multiple regression was used to analyze individual scores and to control for individual differences of age and parental education. Data entry entailed coding children within the three treatment groups, parental education, age of diagnosis, as well as results of pre and post-assessments. Results showed that there were no statistically significant differences between the AP and the GP groups; however, the group receiving intensive behavioral treatment differed significantly in all areas except motor skills.

Howard et al. (2005) conceded to the limitation of random selection and random assignment as well as to possible bias, but the researchers argue that this should not influence results due to the large number of examiners that were used in favor of or against the intensive behavioral treatment. In addition, participant variance was controlled though multiple regression for parental education and subject age.

Although discussed by Howard et al. (2005), sufficient mention of treatment hours was not controlled. There were serious threats to internal validity within this study. Comparing a treatment that was 40 hours a week to treatments that were 30 and 15 hours can not be *fair*. This

means that changes in behavior cannot be solely linked to the treatment, but possibly to time in treatment and fidelity of providers. Intensive behavioral treatment was conducted within a setting that was supervised by a Board Certified Behavior Analyst, while AP and GP were within a setting that relied heavily upon one special education teacher and paraprofessionals. Therefore, the qualities of the programs were not comparable. In addition, parental involvement was required as part of the intensive behavioral treatment program. The authors state that a child was dropped from the intensive behavioral treatment program due to the lack of parents being able to follow the rigorous regiment. Given the requirements of parental involvement for the intensive behavioral treatment, there was no mention or measure of parental involvement for the AP and GP groups.

Cohen, Amerine-Dickens, & Smith (2006) replicated a previous study by Lovaas (1987). They grouped subjects into an experimental group ($n$ = 21) that received 35 to 40 hours of instruction, 47 weeks a year, for 3 years; and a comparison group ($n$ = 21) that received traditional services from a local public day school. All subjects had to have received a diagnosis of autism, pretreatment IQ above 35 with chronological age between 18 and 42 months, no severe medical condition, ability to attend schedule sessions, no more than 400 hours of previous behavioral intervention, and parents' agreement for participation in a home program. A quasi-experimental design was implemented due to "legal and ethical considerations" (p. 146). The two participating community agencies were Valley Mountain Regional Center and the Child's Special Education Local Planning Area.

Parent interview, *Merrill-Palmer Scale of Mental Tests* (Stutsman, 1948) , Reynell *Develpmental Language Scales* (Reynell, 1990) , *Vineland Adaptive Behavior Scale* (VABS) (Sparrow, Balla, & Cicchetti, 1984) and the *Bayley Scales of Infant Development* (BSID)

(Bayley, 1993) were given pretreatment to obtain baseline data and to confirm previous diagnostic testing. For post-testing, if a child reached a ceiling on the *BSID*, the *Wechsler Preschool and Primary Scales of Intelligence* (Wechsler, 1989) was given. Post tests results indicated that the IQ changes between experimental group ($M$ = 87) and control group ($M$ = 73) were significantly different; with no statistical differences on the *Merrill-Palmer Scale of Mental Test (Stutsman, 1948) t* (35) = 1.87, $p$ = .07; no significant differences on the *Reynell Developmental Language Scales* (Reynell, 1990; $p$ = .13); with statistical significance on the VABS ($p$ = .05). The t score and the significance scores were not reported for IQ while the t scores were not reported for the *Reynell Developmental Language Scales* (Reynell, 1990) and the *VABS*. Therefore, the experimental group had greater changes in IQ and in adaptive behaviors as compared to the control group. Implications by the authors were that an intensive behavioral treatment could be replicated in a community setting. Limitations given by the author was that the control group had a greater number of children with the label of Pervasive Developmental Disorder Not Otherwise Specified (PDDNOS) possibly indicating a lesser degree of autism than the experimental group. In addition, the experimental group had a greater number of two parent families with higher educational attainment. Moreover, parents were able to select the treatment services (intensive behavioral vs. traditional public day school services).

The previous four studies provide a chronological review of the research literature on ABA. The initial Lovaas (1987) study provided a program for intensive treatment for early childhood children with autism. The second study by McEachin et al. (1993) sought to determine if gains made by children receiving an intensive behavioral treatment such as ABA were able to maintain those gains. The third study compared ABA to less rigorous and more traditional

approaches of treating children requiring special education services. The final study examined how ABA could be replicated in community settings.

*Pivotal Response (PI).* The area of pivotal response is primarily researched through the University of California at Santa Barbara. The goal of PI treatment is best explained in an article by Koegel, Koegel, Harrower, and Carter (1999). The attempt is:

> "to identify pivotal areas that, when changed, result in concomitant positive changes in other areas. Pivotal areas that are discussed include responsivity to multiple cues, motivation to initiate and respond appropriately to social and environmental stimuli, and self-regulation of behavior, including self-management and self-initiations. The trend to streamline intervention by targeting behaviors that will have widespread effects on development, rather than targeting individual behaviors one at a time" (p. 174).

Therefore, the focus of treatment is sub skills such as motivation, self-initiation, self-management, communication and responsivity to cues within the context of treatment to facilitate widespread changes. PI is a behavioral intervention that focuses upon multiple skills at a time instead of targeting one behavior at a time for remediation. The following studies on pivotal response are presented chronologically and are examples of the targeting of several behaviors through a single pivotal treatment.

The initial study in the category of PI addressed improving social skills and disruptive behavior through self-management (Koegel, Koegel, Hurley, & Frea, 1992). The subjects were four boys. Two were aged six years and ten months, with one eleven years and one month, and the last child eleven years and two months. They were diagnosed with autism from an outside agency, had a language age of at least 3 years old, and were unresponsive to others' verbal communication with a typical response of disruptive behavior. Data were collected across

multiple settings utilizing a multiple stage baseline design. The children in the study were taught appropriate and inappropriate responses to simple questions. The skill of appropriately answering questions was the targeted pivotal social skill in this study. The children with autism were reinforced with small edibles and the children were taught to use a golf counter worn on the wrist to self-track correct responses. The tracking of correct responses by the children was the self-management skill.

The results of the study indicated that the children ranged from 35% to 61% in responding appropriately to others' questions. After the use and fading of prompting, students increased in the amount of appropriate responding from 80% to 100%. In addition, Koegel et al. (1992) demonstrated that the percentage of disruptive behavior decreased from baselines. Although promising, the research design did not utilize random selection nor random assignment, had a small sample size, did not compare treatments, and did not utilize statistical testing to determine if findings were significant.

The second study examined within the PI literature is by Koegel, Werner, Vismary, and Koegel (2005). This study utilized a multiple baseline design and examines the use of motivation during play dates with and without contextual support. The subjects were a girl age eight and a boy age nine. Both families were from middle to upper-middle class. The boy and girl were approximately four years delayed in socialization skills. Treatment for the girl was three months while the boy participated in eight months of treatment. The play dates were weekly. Multiple baseline data included weekly play dates with a typically developed peer with treatment play dates utilizing an adult facilitator. The facilitator ensured that the activities were motivational and that both children were required to complete the activity (i.e., one child would hold a cup while the other child poured).

Reciprocal interaction and affect were measured during baseline and treatments. For reciprocal interaction, data were collected every 30 seconds and coded whether the child with autism was actively engaged with the other child. Results for reciprocal interaction were at baseline on average for the girl 30%- 40% and for the boy 0%-15%. Post treatment data revealed reciprocal interaction for the girl and boy at 70% to 85%. Affect was measured by a six point Likert Scale. A score of 0-1 was given for negative affect such as crying. A score of 2-3 was given for a neutral affect such as not showing any emotional response (i.e., discontent or happiness). A score of 4-5 was given for a positive affect such as laughing or smiling. Results indicated at baselines for the boy and girl and affect range of 2-3. Post treatment affect scores were within the 4-5 range. Koegel et al. (2005) suggested that adult facilitated play using motivational activities can increase peer interaction and social affect. However, it should be noted that there was a small sample size ($n$ = 2), a lack of random selection and assignment, no comparison among treatments, and no statistical testing to determine significance of the results.

*Learning Experiences: An Alternative Program for Preschoolers and Parents (LEAP).* The LEAP program is an intensive play program where peers are taught to be persistent in their initiating interaction with a child with autism. The interactions are planned and set-up through environment and task with teacher prompting. A sample schedule based upon an article by Strain and Hoyson (2000) includes arriving with a greeting, a table activity, circle time, centers, snack, story, and a dismissal with teacher and peer interactions. This daily program lasts for 2-3 years and entails hundreds of planned social interactions. Additional protocol of the LEAP Program is that it is individualized, data driven based upon the unique needs of the child, generalizes well due to treatment in natural context, maximizes instructional opportunities, and has family skill

training. The following article was an 18 year follow-up to an earlier study. Therefore, data from the original study (Hoyson, Jamieson, & Strain 1984) is included in the subsequent discussion.

Strain & Hoyson (2000) examined the outcomes of six children who had originally participated in the LEAP program. The children were 30 to 53 months old at the initiation of treatment. The children had been diagnosed with autism; had been identified as having significant needs in communication, adaptive, and social functioning; and had received a moderate to severe rating on the CARS. As mentioned earlier, the program consisted of daily treatment for 2-3 years.

Results from the two studies (Hoyson, Jamieson, & Strain, 1984; Strain & Hoyson, 2000) revealed that on the CARS the children received at the start of treatment, a mean score of 35, but upon leaving the therapy had a score of 22. The decrease in score demonstrated decreased characteristics of autism. At the age of 10, the children received a mean score of 21 (Strain & Hoyson, 2000). For developmental functioning, the children gained 1.41 months for every month in the program based upon the *Learning Accomplishment Profile* (LeMay, Griffin, & Sanford, 1971). At the age of 10, the children received a mean IQ score on the *Standford-Binet* of 101. The children received a mean of 51% for appropriate engagement with mother at the beginning of the program. When the children left the program, they had a mean of 98% for appropriate engagement with mother. The follow-up study revealed that at age 10, the children received a mean score of 97% with regard to appropriate behavior with mother. Upon initiation of treatment, the children received a mean score of 3% for positive social interaction. Upon leaving the program, the children received a mean score of 23%. For the follow-up study at the age of 10, the children received a mean score of 24%. The authors concluded that behavior change is possible with “longitudinal, carefully designed and intensive social interventions are

delivered in the context of a service delivery system designed to yield maximum developmental growth across all domains of performance" (Strain & Hoyson, 2000).

*Treatment and Education of Autistic and Communication Handicapped Children (TEACCH).* Treatment and Education of Autistic and Communication Handicapped Children is a program that utilizes an Individual Education Program, environmental adaptations, and alternative communication training (Panerai, Ferrante, and Zingale, 2002; Panerai, Ferrante, Caputo, and Impellizzeri, 1998; Schopler and Reichler, 1971). The environment, curriculum, schedule, and tasks are structured to ensure that the child with autism learns patterns that will help them navigate within their surroundings. These patterns of behaviors are then applied across the various contexts of home, school, and community. The following three studies are presented chronologically. The initial study details early research on the use of structure and parents as co-therapists. The second study examines the efficacy of the TEACCH methodology for children with autism. The third study compares the TEACCH methodology to traditional inclusive day schooling.

An early, classic study completed by Schopler and Reichler (1971) focused upon parents utilizing methodologies of TEACCH within the home environment. These strategies included high levels of structure and the learning of patterns to "prevent the elaboration of psychosis, to increase adaptation between the child and his family, and to promote recovery where possible" (p. 88). For inclusion in the program, children had to of received a diagnosis of autism or psychosis, had an *intact family* with ability to participate in the research, and the child must have been functioning at the preschool level. The children were measured on an instrument by Creak (1961) and refined by Rutter (1970). The areas of measurement included relatedness, speech

impairment, sensory peculiarities, peculiar motility patterns, abnormal activity levels, intellectual functioning, and unpredictable mood.

The parents were trained by directly observing trained clinicians during the establishment of a home program. The home program consisted of daily lessons. Both parents were expected to participate in the daily session. Ten families participated in the research study. For those children who had been in the study for at least six months, parents had higher ratings on attention, affect, relatedness, verbal behavior, and nonpsychotic behavior than therapists. However, the ratings for parents and therapists were not given within the study. Schopler and Reichler (1971) simply stated that parent ratings *were higher*. Three of the 10 mothers became teachers in the program. Schopler and Reichler (1971) suggested that "it is time to recognize the autistic child's parent as the integral agent to the solution of his child's problems rather than as having caused them" (p. 101).

The second study by Panerai, Ferrante, Caputo, and Impellizzeri (1998) examined the treatment efficacy of TEACCH. Eighteen children (17 boys and 1 girl) with mean chronological age of 13 years and mean mental age of 16 months participated in the TEACCH program for 18 months. Students were measured using the *Childhood Autism Rating Scale* (CARS) (Mesibov, Schopler, Schaffer, & Michal, 1989), the *VABS*, *Psychoeducational Profile-Revised* (Schopler & Reichler, 1971) , and the *Echelle d'Evaluation Fonctionelle des Comportements of LeLord* (Barthelemy, Hamenry, & Lelord, 1995).

Results of the study indicated that on the *VABS* students' demonstrated significant improvement ($p < .01$, $p < .05$) on communication, daily living skills, and socialization. On the *Psychoeducational Profile-Revised* students demonstrated significance ($p. < .01$) on imitation, fine/gross motor, eye-hand integration, and cognitive performance. The *Echeel d'Evaluation*

*Fonctionelle des Comportements of LeLord* (Barthelemy, Hamenry, & Lelord, 1995) students increased more than one-third in the areas of attention, association, emotion, communication, instinct and regulation. With regard to behavior, problems continued; however, they were reduced significantly ($p < .05$). Communication also improved significantly ($p < .01$).

Panerai, Ferrante, and Zingale (2002) compared the TEACCH program with inclusive programming in a public day school. The TEACCH program was completed within a residential, scientific institute in Italy while the public day school was an Italian elementary school that included a classroom teacher and support personnel. Sixteen males with a mean age of 9 years participated in the study. The children were matched by intellectual disability and label of autism. Eight children received services through the TEACCH program while the remaining children were served by the public day school. Autism was diagnosed through the DSM-IV, the *CARS*, and the *VABS*. The two groups were statistically significantly different using the Student t-test ($p < .05$). The experimental group was statistically different with greater chronological age, younger mental age, more autistic characteristics, and more associated pathologies (i.e., epilepsy).

The children receiving the TEACCH program resided at the Troina-based Oasi Maria SS Scientific Institute for Hospitalization and Treatment of Individuals with Mental Retardation. The children went home on the weekends and other identified intervals. Educators implemented the program with support from a management team. The children in the TEACCH program were divided into small homogonous groups targeting IEP goals, environmental adaptations, and alternative communication training. Supports such as, physical boundaries, work systems, and visual schedules were used consistently with the TEACCH program. The control groups attended public day schools and were integrated with children without disabilities, and received the

benefit of a support teacher. The control group also received speech therapy, psychomotor therapy, and physical therapy if warranted. Environmental, schedule, and communication supports were decided upon by individual teachers and cannot be determined.

The *PscyhoEducational Profile-Revised* (Schopler & Reichler, 1971) was used to measure the groups initially and then again after one year of services. The PEP-R measures imitation, perception, fine motor, gross motor, hand-eye coordination, cognitive performance, cognitive-verbal performance, and yields a mental age. The *VABS* was also given pre and post-test with a one year time period.

The PEP-R revealed significant differences in the experimental and control groups in imitation ($p < .05$), perception ($p < .02$), gross motor skills ($p < .05$), hand-eye coordination ($p < .05$), cognitive performance ($p < .02$), total score ($p < .02$), and developmental age ($p < .02$). The control group was significantly different from the experimental group in hand-eye coordination ($p < .02$). The experimental group was statistically different in personal domains ($p < .05$), total daily living skills ($p < .05$), play and leisure ($p < .05$), and total score ($p < .05$). The control group was statistically different on daily living skills ($p < .05$). Statistical significance was obtained using the Wilcoxon Test.

It should be noted that Panerai et al. (2002) did not use random selection or random assignment. Furthermore, the experimental group received treatment in an institute with trained personnel utilizing a specific treatment approach with standardized procedures while the control group received a plethora of non-documented treatments that were not defined from one classroom teacher and support personnel. The credentials of the support personnel were not described and the make-up of the general education classrooms was not identified.

*DIR/Floortime.* Developmental, Individual-Difference, Relationship-Based (DIR/Floortime) model is a "comprehensive intervention program that focused on the building blocks of relating, communicating, and thinking" (Wieder & Greenspan, 2005, p. 40). Individual focus for the child is on sensory processing, sensory discrimination, motor planning, and family interaction. In addition, "during spontaneous 'floor time' play sessions, adults follow the child's lead utilizing affectively toned interactions through gestures and words to move the child up the symbolic ladder by first establishing a foundation of shared attention, engagement, simple and complex gestures, and problem solving to usher the child into the world of ideas and abstract thinking" (Wieder & Greenspan, 2003, p. 425). In practice, intensive time is spent on the floor with the child with autism increasing the child's affect and building relationships. The child may also receive special education, physical, occupational and speech therapy. A home program is an additional component of the intervention. The initial study (Greenspan & Wieder, 1997) detailed the cases of children ($n$ = 200) treated using the DIR/Floortime treatment approach from initial introduction to final discharge. The second study (Wieder & Greenspan, 2005) was a follow-up study that examined 16 of the 20 best outcomes students identified in the 1997 research.

Greenspan and Wieder (1997) reviewed the charts of 200 students identified with autism spectrum disorder between the ages of 22 months and 4 years, were treated using the DIR/Floortime methodology for 2 or more years, had scored within the autism range on the *CARS*, and had college educated families. The treatments were completed at a private setting with one-half of the children traveling from out-of-state and the other one-half from the local surrounding area. Assessments were completed every 2 to 6 months. Results indicated that 58% of the students had achieved good to outstanding outcomes. These students were able to participate in long strands of reciprocity, had varying affect, and had symbolism. Twenty-five

percent of the students were classified as *medium* in their outcomes. These children had shared attention, but had difficulty with long strands of reciprocity and some difficulty with symbolism. Seventeen percent had significant difficulty. These students had great difficulty with attending, ranges of self-absorption and avoidance, and inconsistency with regard to improvement and regression.

Greenspan and Wieder (1997) completed an additional study of twenty students identified as having exceptional outcomes. These students received 2-8 years of intervention. On the *VABS,* 60% scored 1-2 years higher than chronological aged peers in communication, 25% more than 1 year on the social domain, 40% scored more than 2 years on the social domain, and 25% scored more than 3 years on the social domain. Moreover, none of the students had maladaptive behavior.

Furthermore, Greenspan and Wieder (1997) reviewed the charts of children who had received other traditional and behavioral treatments ($n$ = 53) aged 4-10 years and found that only 2% of these children had good to outstanding outcomes, 40% had achieved medium outcomes, and 58% continued to have significant disabilities. In sum, Greenspan and Wieder (1997) concluded that the DIR/Floortime was an efficacious treatment for children with autism spectrum disorders. It should be noted that statistical analysis was purposefully avoided by the authors to maintain a descriptive focus. The reader is cautioned that the sample sizes for comparison were not equivalent for the experimental and control groups ($n$ = 200, $n$ = 53 respectively). The families from both groups were college educated, but the comparison group ($n$ = 53) had come to the DIR/Floortime setting to seek additional options. Therefore, the populations may not have been truly representative of the traditional or behavioral treatments.

Wieder and Greenspan (2005) sought to follow-up on available children ($n$ = 16) in the exceptional outcomes category from the previously examined study. The *Functional Emotional Assessment Scale* (FEAS) (Greenspan, DeGangi, & Wieder 2001), *Achenbach Scales* (Achenbach, 1991), and school cognitive reports were used to assess the children for the present study. All the children in the present study received DIR/Floortime Therapy (range of intensive interventions 2-5 years) with additional therapies ($M$ = 8) from the age of two to eight and half-years old. The amount and types of additional services were not regulated due to many children participating in speech, sensory integration, auditory integration, and casein/gluten-free diets.

The *FEAS* is a parent questionnaire that examines parents' perception of emotion, social, and intellectual capacities for their children. On this scale, parents rate their child from 1-7, with 7 as the best outcome. Results indicated that for regulation and shared attention the parents' mean score was 6.9. For engagement, the parents' mean score was 6.9. The Two-Way Intentional Affective Signaling and Communication subtest examined how well children demonstrated emotions, gestures, and interaction flow. The mean score for this subtest was 6.9. For Social Problem Solving the mean score was 6.8. For Creating Symbols and Ideas, a subtest that examines the expression of ideas and feeling, the mean was 6.6. For Higher Order Thinking, a subtest that examines multiple skills, the parents' scores ranged from 5.2 to 6.4 with no mean calculated due to variance in constructs.

The scales revealed that 94% of the children were in the normal range for social competence. Eighty-eight percent of the children were in the normal range for activities. Moreover, 88% of the children were also in the normal range for school competence. Only one-third of the participants had received IQ testing. The results of the IQ testing indicated average to superior scores.

In critique, random selection and sampling was not completed in the original study or subsequent follow-up studies; therefore, threats to internal and external validity are present. In addition, there was not the presence of a treatment protocol to ensure that there was not the presence of multi-treatment interference. Finally, statistical analysis was not completed to determine significance of pre/post treatment outcomes. Although there are additional criticisms, for the purpose of this examination, only primary substantive deficits were noted.

# Chapter 3

## METHODOLOGY

The following chapter details the purpose of the study, research design that was employed, rationale for design, population that was sampled, a description of the survey instrument, content validity of instrument, reliability, and description of statistical analysis.

The purpose of the study was to investigate the extent to which specially designed programs for autistic students are being used to provide effective instruction in the Commonwealth of Virginia. More specifically, this inquiry sought to answer: (1) What programs are being used in the Commonwealth of Virginia to serve children identified with the educational disability label of autism? (2) What is the degree of effectiveness of these programs as perceived by directors of special education? and (3) Do selected demographics of the school division influence the types of programs that are delivered?

*Research Design.* The design that was used to answer the research question was a survey study that was descriptive in nature. The objective of the study was to obtain data within the Commonwealth of Virginia utilizing a survey tool. The independent variables were types of programming (i.e., TEACCH, ABA, LEAP) and school division demographics. The dependent variable was effectiveness of programs.

*Population Sample.* The directors of special education or equivalent for each school division were selected as the target population for the purpose of this study ($n$ = 139). Directors of special education were selected due to their: 1) direct accountability to the superintendent for special education services within the school division; 2) specialized training in special education, special education law, individualized education program development; and 3) administrative training in program evaluation, formative and summative evaluation. All directors of special

education in Virginia were given opportunity to participate. The desired return rate for survey participation was 100 when given a population size of 139 (Cochran, 1977; Bartlett, Kotrlik, & Higgins 2001).

*Survey Instrument.* The measurement tool that was utilized for the purpose of this inquiry was a cross-sectional, census survey (Babbie 1990). The cover letter and survey was printed on high-quality copier paper to ensure professional quality (Appendix B). The survey itself was 15 questions in length and arranged into 3 sections: a) programming, b) effectiveness, and c) demographics to correspond with research questions. Systematic language with clear directions was used to decrease confusion and to ensure understanding of the constructs under investigation.

*Validity.* To determine validity, an item analysis was completed to determine face value of each question and the corresponding relationship with the other items on the survey. Duplicate questions were deleted. Two focus groups were completed to ensure that the survey instrument is not confusing, is easy complete, and that questions are worded correctly. The initial focus group examined the survey instrument on July 5, 2006, and consisted of a special education teacher with post graduate training in administration and a school principal. Therefore, the initial focus group was specifically trained in special education and in administration and supervision. The first focus group suggested format changes, questions that were duplicated to be omitted, and the rewording of questions.

The second focus group consisted of 10 administrators during a summer residency program for doctoral studies. The second focus group met on July 24, 2006 and recommended that a short definition for autism be included at the beginning of the survey to ensure that respondents had a working definition of autism. Additional changes included the bolding of

words within the directions. The words that needed to be bolded included *definition, representative,* and *all*.

Marie Ireland, from the Virginia Department of Education, agreed to be an expert-reviewer for the survey instrument. She is the autism specialist for the Commonwealth of Virginia and is also a speech-language pathologist. She recommended that two additional questions be added to the survey instrument to determine if directors of special education believe that there is a need for an endorsement in autism for school personnel in Virginia and if directors believe an endorsement will improve services.

*Reliability.* Reliability testing was completed on the survey questions that were on a Likert Scale. Reliability testing on questions 7, 8, 9, 10, 12a, 12b, 12c, 12d, and 12e, indicated that Cronbach's Alpha based on standardized items was .779. This Alpha is considered sufficient for research purposes (see Table 1). Analysis was completed using SPSS 14.0.

Table 1

*Reliability Statistics*

| Cronbach's Alpha | Cronbach's Alpha based on Standardized Items | N of item |
|---|---|---|
| .721 | .779 | 9 |

Secondly, item statistics was included to provide mean, standard deviation and *n* for each of the questions (see Table 2). It should be noted that *strongly agree* was coded as a 4, *agree* was coded as a 3, *disagree* was coded as a 2, and *strongly disagree* was coded as a 1. As indicated, question 7 (SCH) asked if they agreed that their school division effectively served children with autism. The mean for question 7 was 3.12 with a standard deviation of .582. Question 8 (PER) asked if they agreed that their school personnel were effectively trained to serve children with autism. The mean for question 8 was 2.85 with a standard deviation of .642. Question 9 (END) asked if they agreed that there was a need for an endorsement in autism for school personnel in

Virginia. The mean for question 9 was 2.87 with a standard deviation of 1.038. Question 10 (EIM) asked if they agreed that an additional endorsement in autism would improve services to children and families. The mean for question 10 was 2.94 with a standard deviation of .998.

Table 2

*Item Statistics*

| | Mean | Std. Deviation | N |
|---|---|---|---|
| SCH | 3.12 | .582 | 86 |
| PER | 2.85 | .642 | 86 |
| END | 2.87 | 1.038 | 86 |
| EIM | 2.94 | .998 | 86 |
| INC | 3.21 | .596 | 86 |
| GRA | 2.98 | .573 | 86 |
| SOL | 2.95 | .649 | 86 |
| IQ | 2.97 | .622 | 86 |
| DIS | 3.08 | .598 | 86 |

Question 12a (INC) asked if they agreed that current programming effectively improves access to general education classes and curriculum. The mean for question 12a was 3.21 with a standard deviation of .596. Question 12b (GRA) asked if they agreed that current programming effectively increased graduation rates. The mean for question 12b was 2.98 with a standard deviation of .573. Question 12c (SOL) asked if they agreed that current programming increased pass rates on SOL's, VGLA, and VAAP. The mean for question 12c was 2.95 with a standard deviation of .649. Question 12d (IQ) asked if they agreed that current programming effectively improves IQ scores, language, adaptive behavior skills, social skills, fine/gross motor skills, and other sub skills. The mean was 2.97 with a standard deviation of .622. Question 12e (DIS) asked if they agreed that current programming effectively decreased discipline referrals, homebound services, and decreased use of private day facilities, and/or residential placement. The mean was 3.08 with a standard deviation of .598.

Table 3 details how each item correlates to other items on the survey. A score of 1.000 indicates that the item correlates perfectly. For example, the item SCH correlates perfectly with itself (1.000). The smaller the number, the less it correlates with the item in comparison.

Table 3

*Inter-Item Correlation Matrix*

| | SCH | PER | END | EIM | INC | GRA | SOL | IQ | DIS |
|---|---|---|---|---|---|---|---|---|---|
| SCH | 1.000 | .551 | -.131 | -.110 | .471 | .360 | .326 | .336 | .411 |
| PER | .551 | 1.000 | -.082 | -.051 | .422 | .310 | .350 | .311 | .277 |
| END | -.131 | -.082 | 1.000 | .890 | -.127 | -.084 | .026 | -.043 | .017 |
| EIM | -.110 | -.051 | .890 | 1.000 | -.118 | -.085 | .068 | -.0.60 | .028 |
| INC | .471 | .422 | -.127 | -.118 | 1.000 | .634 | .603 | .464 | .512 |
| GRA | .360 | .310 | -.084 | -.085 | .634 | 1.000 | .661 | .426 | .554 |
| SOL | .326 | .350 | .026 | .068 | .603 | .661 | 1.000 | .666 | .676 |
| IQ | .336 | .311 | -.043 | -.060 | .464 | .426 | .666 | 1.000 | .671 |
| DIS | .411 | .277 | .017 | .028 | .512 | .554 | .676 | .671 | 1.000 |

Table 4 indicates how Chronbach's Alpha would change if an item were deleted. As a result of analysis, Chronbach's Alpha would not increase if any of the items were deleted.

Table 4

*Item-Total Statistics*

| | Scale Mean Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|---|
| SCH | 23.85 | 11.212 | .377 | .418 | .701 |
| PER | 24.12 | 11.069 | .361 | .358 | .703 |
| END | 24.09 | 10.627 | .195 | .797 | .756 |
| EIM | 24.02 | 10.564 | .225 | .803 | .745 |
| INC | 23.76 | 10.704 | .503 | .532 | .682 |
| GRA | 23.99 | 10.812 | .499 | .551 | .683 |
| SOL | 24.01 | 9.918 | .656 | .680 | .653 |
| IQ | 24.00 | 10.588 | .506 | .562 | .680 |
| DIS | 23.88 | 10.399 | .604 | .593 | .666 |

*Statistical Analysis*

Descriptive statistics and a One-Way ANOVA were used to analyze the responses to the survey instrument. Descriptive statistics included frequency and percentiles. The One-Way ANOVA compared means, allowing for determination of statistical significance. However, it should be noted that an ANOVA does not determine which means are more significant than another. The Tukey Test of Multicomparison was used to determine which mean scores were statistically significantly different. Chapter 4 contains detailed analysis of study results. SPSS 14.0 was used to complete statistical analysis.

The school divisions were initially coded on scale of 1 – 9 depending on the population of the county where they are located. However, in order to group the school divisions into meaningful constructs, further recoding was completed to group school divisions into *metro, urban,* or *rural* based upon population of the county (see Appendix C).

# Chapter 4

## RESULTS

The following chapter utilizes descriptive statistics and a One-Way ANOVA to analyze the responses to the survey instrument. Analysis will focus upon the three research questions at hand: (1) What programs are being used in the Commonwealth of Virginia to serve children identified with the educational disability label of autism? (2) What is the degree of effectiveness of these programs as perceived by directors of special education? and (3) Do selected demographics of the school division influence the types of programs that are delivered?

Descriptive analysis will be reported for each of the survey questions. Included in the descriptive analysis may be summary data, central modes of tendency, and standard deviations. In sum, this provides an overview of services for children with autism across the Commonwealth of Virginia. First, a concise statement will indicate the results. A table illustrating the findings will follow.

A One-Way ANOVA will be completed to answer research questions 2 and 3. The completion of an ANOVA will determine whether a relationship exists between: (a) the programs being utilized to provide services for children with autism and the perceived effectiveness and (b) the demographics of the school divisions and the types and perceived effectiveness of programs being used. Post hoc testing will be completed to determine which findings are more significant.

All statistical analyses were completed using SPSS 14.0. Ninety-three surveys were completed out of 139 possible. This accounted for a 66.9% return rate. Although valid and cumulative percentages are shown in the tables, they are not used in the discussion.

## Item by Item Analysis

Ninety-one of the ninety-three respondents answered yes to question 1, indicating that the individual completing the survey was the director of special education. This indicates that 97.8% of the surveys were completed by an individual directly answerable to the superintendent for special education services (see Table 5). Furthermore, 92 of the 93 respondents answered yes to question 2, indicating that 98.9% of the school divisions serve children with autism spectrum disorders.

Table 5

*Are you the Director of Special Education or an Individual Directly Responsible for Special Education Services in Your School Division?*

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Director | 91 | 97.8 | 97.8 | 97.8 |
| Not the Director | 2 | 2.2 | 2.2 | 100.0 |
| Total | 93 | 100.0 | 100.0 | |

*Programming.* Questions 3-6 related directly to programming. As the following tables indicates, 50.5% of the respondents indicated that they offer specially designed programs for students with autism, whereas 48.4% of the directors indicated that their school division only offers traditional special education services for children with autism (see Table 6).

Table 6

*Specially Designed Programs or Traditional Special Education Programming*

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Specially Designed Programs | 47 | 50.5 | 51.1 | 51.1 |
| Traditional Special Education | 45 | 48.4 | 48.9 | 100.0 |
| Total | 92 | 98.9 | 100.0 | |
| Missing | 1 | 1.1 | | |
| Total | 93 | 100.0 | | |

Question 4 directly relates to the location of services. Of the schools surveyed, 17.2% offer a specially designed program for students with autism in their home school while 33.3% of the schools surveyed offer a centrally located program for children with autism. Moreover, 46.2% of the respondents indicated that each school offers children with autism traditional special education services. Lastly, 2.2% of the school divisions offer traditional special education services in a centrally located program (see Table 7).

Table 7

*Location of Services*

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| School Based Specially Designed | 16 | 17.2 | 17.4 | 17.4 |
| Centrally Located Specially Designed | 31 | 33.3 | 33.7 | 51.1 |
| Traditional Special Ed. Each School | 43 | 46.2 | 46.7 | 97.8 |
| Traditional Special Ed. Centrally Located | 2 | 2.2 | 2.2 | 100.0 |
| Total | 92 | 98.9 | 100.0 | |
| Missing | 1 | 1.1 | | |
| Total | 93 | 100.0 | | |

Question 5 focuses upon the type of programming used by school divisions in the Commonwealth of Virginia. As indicated, 41.9% of the school divisions answered that they primarily use traditional special education services, 31.2% use a combination of programs to serve children with autism, 15.1% make use of ABA, 9.7% utilize TEACCH primarily, 2.2% employ the DIR Floortime model, and none of the school divisions responded that they primarily use LEAP or Pivotal Response (see Table 8).

Table 8

*Type of Programs*

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| TEACCH | 9 | 9.7 | 9.7 | 9.7 |
| ABA | 14 | 15.1 | 15.1 | 24.7 |
| DIR | 2 | 2.2 | 2.2 | 26.9 |
| Traditional | 39 | 41.9 | 41.9 | 68.8 |
| Combination | 29 | 31.2 | 31.2 | 100.0 |
| Total | 93 | 100.0 | 100.0 | |

Question 6 focuses upon what determines the type of programming that the school division employs. Initially the choices were: a) available resources, b) faculty and staff training in a particular method, c) research, d) commercially available resources, and e) other. The respondents listed under *other* the needs of the students and IEP, and a combination of all of the above. Therefore; *other* was recoded to reflect the additional data and were inserted into the table as: Combination and IEP/Needs.

The results indicate that 19.4% of the programs were selected due to available resources (i.e. fiscal, personnel, transportation, and building facilities), 25.8% were selected due to faculty and staff training in a particular method, 12.9% were selected based upon research, 1.1% were selected due to the availability of commercial resources, 31.2% were selected due to the needs of the student as reflected in the IEP, and 8.6% were selected due to a combination of the aforementioned reasons (see Table 9).

Table 9

*What Determines Type of Programming?*

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Combination | 8 | 8.6 | 8.7 | 8.7 |
| IEP/Needs | 29 | 31.2 | 31.5 | 40.2 |
| Commercial | 1 | 1.1 | 1.1 | 41.3 |
| Research | 12 | 12.9 | 13.0 | 54.3 |
| Training | 24 | 25.8 | 26.1 | 80.4 |
| Resources | 18 | 19.4 | 19.6 | 100.0 |
| Total | 92 | 98.9 | 100.0 | |
| Missing | 1 | 1.1 | | |
| Total | 93 | 100.0 | | |

*Effectiveness.* Question 7 examines whether the respondents agreed that their school division effectively serves children with autism. None of the respondents strongly disagreed with the statement, 10.8% disagree, 66.7% agree that their school division effectively serves children with autism, and 22.6% strongly agree that their school division effectively serves children with autism (see Table 10).

Table 10

*I Feel That my School Division Effectively Serves Children with Autism.*

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Strongly Agree | 21 | 22.6 | 22.6 | 22.6 |
| Agree | 62 | 66.7 | 66.7 | 89.2 |
| Disagree | 10 | 10.8 | 10.8 | 100.0 |
| Total | 93 | 100.0 | 100.0 | |

Question 8 asked whether the respondents agree that school personnel are effectively trained to serve children with autism. Of the directors responding, 1.1% strongly disagreed that personnel in their school division were effectively trained, 25.8% disagreed with the statement, 59.1% agreed that their personnel were effectively trained, and 12.9% strongly agreed that their personnel were effectively trained to serve children with autism (see Table 11).

Overwhelmingly, (72%) the directors agreed or strongly agreed that their school division personnel were effectively trained.

Table 11

*I Feel That School Personnel are Effectively Trained to Serve Children with Autism.*

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Strongly Agree | 12 | 12.9 | 13.0 | 13.0 |
| Agree | 55 | 59.1 | 59.8 | 72.8 |
| Disagree | 24 | 25.8 | 26.1 | 98.9 |
| Strongly Disagree | 1 | 1.1 | 1.1 | 100.0 |
| Total | 92 | 98.9 | 100.0 | |
| Missing | 1 | 1.1 | | |
| Total | 93 | 100.0 | | |

Question 9 asked whether the respondents agree that there is a need for an endorsement in autism for school personnel in Virginia. Of those responding, 14.0% strongly disagreed that there is a need for an endorsement in autism, 17.2% disagreed that there is a need, 34.4% agreed that there is a need for an endorsement in autism, whereas 34.4% strongly agreed that there is a need for an endorsement in autism in Virginia (see Table 12).

Table 12

*I Feel That There is a Need for an Endorsement in Autism for School Personnel in Virginia.*

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Strongly Agree | 32 | 34.4 | 34.4 | 34.4 |
| Agree | 32 | 34.4 | 34.4 | 68.8 |
| Disagree | 16 | 17.2 | 17.2 | 86.0 |
| Strongly Disagree | 13 | 14.0 | 14.0 | 100.0 |
| Total | 93 | 100.0 | 100.0 | |

Question 10 asked whether respondents agree that an additional endorsement in autism will improve services to children and families. Of those responding, 10.8% strongly disagreed,

17.2% disagreed, 36.6% agreed, and 35.5% strongly agreed that an endorsement in autism will improve services to children and families (see Table 13).

Table 13

*I Feel That an Additional Endorsement in Autism will Improve Services to Children and Families*

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Strongly Agree | 33 | 35.5 | 35.5 | 35.5 |
| Agree | 34 | 36.6 | 36.6 | 72.0 |
| Disagree | 16 | 17.2 | 17.2 | 89.2 |
| Strongly Disagree | 10 | 10.8 | 10.8 | 100.0 |
| Total | 93 | 100.0 | 100.0 | |

Question 11 requested that respondents list the endorsement areas that primarily provide services to children with autism. Consequently, the directors listed one or more than one answer, depending on the services within their respective school division. The results indicate that one hundred and twenty-nine endorsements were listed. Of that total, mental retardation was listed the most frequently with 37.9%, endorsement in learning disabilities was listed secondly at 29.4%, teachers with endorsement in emotional disturbance was listed thirdly at 15.5%, endorsement in early childhood special education was listed fourthly at 9.3%, and speech-language pathology was fifth at 3.8%. The remaining respondents listed that children with autism were served by occupational therapists, physical therapists, and that children were served by special educators serving children with developmental delay. Directors reported that lower functioning children were often served by teachers endorsed in mental retardation while higher functioning children were served by teachers endorsed in learning disabilities. Additional comments included that many children with autism spent much of the day in general education classrooms. Lastly, comments concluded that special education teachers serving children with

autism may hold multiple endorsement areas in mental retardation, learning disabilities, and emotional disturbance (see Table 14).

Table 14

*Endorsement Areas Serving Children with Autism*

| Endorsement Area | Frequency | Percent |
|---|---|---|
| Mental Retardation | 49 | 37.9 |
| Learning Disabilities | 38 | 29.4 |
| Emotional Disturbance | 20 | 15.5 |
| Early Childhood Special Education | 12 | 9.3 |
| Speech-Language Pathologists | 5 | 3.8 |
| OT, PT, and Teachers working with Developmental Delay | 5 | 3.8 |
| Total | 129 | 99.7 |

Question 12a asked if current programming effectively improves greater access to general education classes and curriculum (inclusive practice). Of the respondents, 1.1% strongly disagreed, 5.4% disagreed, 62.4% agreed, and 29.0% strongly agreed that their school division's current programming effectively improves greater access to general education classes and curriculum (see Table 15).

Table 15

*I Feel That Current Programming Effectively Improves Access to General Education Classes and Curriculum.*

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Strongly Agree | 27 | 29.0 | 29.7 | 29.7 |
| Agree | 58 | 62.4 | 63.7 | 93.4 |
| Disagree | 5 | 5.4 | 5.5 | 98.9 |
| Strongly Disagree | 1 | 1.1 | 1.1 | 100.0 |
| Total | 91 | 97.8 | 100.0 | |
| Missing | 2 | 2.2 | | |
| Total | 93 | 100.0 | | |

Question 12b asked if current programming effectively improves graduation rates. Of the respondents 1.1% strongly disagreed, 12.9% disagreed, 66.7% agreed, and 14.0% strongly agreed that their school division's current programming effectively improves graduation rates (see Table 16).

Table 16

*I Feel That Current Programming Effectively Improves Graduation Rates.*

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Strongly Agree | 13 | 14.0 | 14.8 | 14.8 |
| Agree | 62 | 66.7 | 70.5 | 85.2 |
| Disagree | 12 | 12.9 | 13.6 | 98.9 |
| Strongly Disagree | 1 | 1.1 | 1.1 | 100.0 |
| Total | 88 | 94.6 | 100.0 | |
| Missing | 5 | 5.4 | | |
| Total | 93 | 100.0 | | |

Question 12c asked if current programming effectively improves pass rates on SOL's, VGLA, and VAAP. Of those responding, 2.2% strongly disagreed, 15.1% disagreed, 62.4%

agreed, and 16.1% strongly agreed that their school division's current programming improves pass rates on SOL's, VGLA, and VAAP (see Table 17).

Table 17

*I Feel That Current Programming Effectively Improves Pass Rates on SOL's, VGLA, and VAAP.*

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Strongly Agree | 15 | 16.1 | 16.9 | 16.9 |
| Agree | 58 | 62.4 | 65.2 | 82.0 |
| Disagree | 14 | 15.1 | 15.7 | 97.8 |
| Strongly Disagree | 2 | 2.2 | 2.2 | 100.0 |
| Total | 89 | 95.7 | 100.0 | |
| Missing | 4 | 4.3 | | |
| Total | 93 | 100.0 | | |

Question 12d asked if current programming effectively improves IQ scores, language, adaptive behavior skills, and social skills, fine/gross motor skills, and other sub skills. Of those responding, 2.2% strongly disagreed, 12.9% disagreed, 65.6% agreed, and 15.1% strongly agreed their school division's current programming effectively improves IQ scores, language, adaptive behavior skills, social skills, fine/gross motor skills, and other sub skills (see Table 18).

Table 18

*I Feel That Current Programming Effectively Improves IQ Scores, Language, Adaptive Behavior Skills, Social Skills, Fine/Gross Motor Skills, and Other Sub Skills.*

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Strongly Agree | 14 | 15.1 | 15.7 | 15.7 |
| Agree | 61 | 65.6 | 68.5 | 84.3 |
| Disagree | 12 | 12.9 | 13.5 | 97.8 |
| Strongly Disagree | 2 | 2.2 | 2.2 | 100.0 |
| Total | 89 | 95.7 | 100.0 | |
| Missing | 4 | 4.3 | | |
| Total | 93 | 100.0 | | |

Question 12e asked if current programming effectively decreases discipline referrals, homebound services, and decreased use of private day facilities, and/or residential placement. Of those responding, 1.1% strongly disagreed, 9.7% disagreed, 65.6% agreed, and 20.4% strongly agreed that their school division's current programming effectively decreases discipline referrals, homebound services, decreased use of private day facilities, and/or residential placement (see Table 19).

Table 19

*I Feel That Current Programming Effectively Decreases Discipline Referrals, Homebound Services, Decreased use of Private Day Facilities, and/or Residential Placement.*

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Strongly Agree | 19 | 20.4 | 21.1 | 21.1 |
| Agree | 61 | 65.6 | 67.8 | 88.9 |
| Disagree | 9 | 9.7 | 10.0 | 98.9 |
| Strongly Disagree | 1 | 1.1 | 1.1 | 100.0 |
| Total | 90 | 96.8 | 100.0 | |
| Missing | 3 | 3.2 | | |
| Total | 93 | 100.0 | | |

Effectiveness of the programs were explored in greater detail. A One-Way ANOVA was completed to determine significance of the means for each program as related to perceived effectiveness by the directors of special education. Table 18 illustrates the descriptive statistics for each of the programs and the perceived effectiveness. The TEACCH Program has a mean of 3.11 with a standard deviation of .601. The ABA Program has a mean of 3.14 with a standard deviation of .663. The DIR Floortime Program has a mean of 3.5 with a standard deviation of .707. The Traditional Program has a mean of 2.9 with a standard deviation of .502. A Combination of Programs has a mean of 3.38 with a standard deviation of .494. It should once again be noted that no school division reported using Pivotal Response or LEAP primarily to serve children with autism (see Table 20).

Table 20

*Comparison of Perceived Effectiveness of Programs*

| | N | Mean | Std. Deviation | Std. Error | Lower Bound | Upper Bound | Minimum | Maximum |
|---|---|---|---|---|---|---|---|---|
| TEACCH | 9 | 3.11 | .601 | .200 | 2.65 | 3.57 | 2 | 4 |
| ABA | 14 | 3.14 | .663 | .177 | 2.76 | 3.53 | 2 | 4 |
| DIR | 2 | 3.50 | .707 | .500 | -2.85 | 9.85 | 3 | 4 |
| Traditional | 39 | 2.90 | .502 | .080 | 2.73 | 3.06 | 2 | 4 |
| Combination | 29 | 3.38 | .494 | .092 | 3.19 | 3.57 | 3 | 4 |
| Total | 93 | 3.12 | .568 | .059 | 3.00 | 3.24 | 2 | 4 |

A comparison of the mean scores for the programs indicated that there was statistical significance $F(4, 88) = 3.602$, $p < .05$); therefore we must reject the null hypothesis that the means are equivalent. However, a One-Way ANOVA does not determine which program is more significant than another (see Table 21).

Table 21

*Analysis of Variance for Programs*

| | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 4.178 | 4 | 1.045 | 3.602 | .009 |
| Within Groups | 25.521 | 88 | .290 | | |
| Total | 29.699 | 92 | | | |

Therefore, Tukey Test for Multicomparison was completed to determine which program(s) means were more significant. Results of post hoc testing indicated that the mean for Combination Programming is statistically more significant than the mean for Traditional Programming when perceived effectiveness is examined. Conversely, the means for TEACCH, ABA, DIR Floortime are not statistically significant one from the other or from Traditional and Combination Programming (see Table 22).

Table 22

*Significance of the Perceived Effectiveness and Programming*

| | Mean Difference | Std. Error | Sig. | Lower Bound | Upper Bound |
|---|---|---|---|---|---|
| TEACCH | | | | | |
| ABA | -.032 | .230 | 1.000 | -.67 | .61 |
| DIR | -.389 | .421 | .887 | -1.56 | .78 |
| Traditional | .214 | .199 | .820 | -.34 | .77 |
| Combination | -.268 | .205 | .689 | -.84 | .30 |
| ABA | | | | | |
| TEACCH | .032 | .230 | 1.000 | -.61 | .67 |
| DIR | -.357 | .407 | .905 | -1.49 | .78 |
| Traditional | .245 | .168 | .589 | -.22 | .71 |
| Combination | -.236 | .175 | .661 | -.72 | .25 |
| DIR | | | | | |
| TEACCH | .389 | .421 | .887 | -.78 | 1.56 |
| ABA | .357 | .407 | .905 | -.78 | 1.49 |
| Traditional | .603 | .390 | .537 | -.48 | 1.69 |
| Combination | .121 | .394 | .998 | -.98 | 1.22 |
| Traditional | | | | | |
| TEACCH | -.214 | .199 | .820 | -.77 | .34 |
| ABA | -.245 | .168 | .589 | -.71 | .22 |
| DIR | -.603 | .390 | .537 | -1.69 | .48 |
| Combination | -.482* | .132 | .004 | -.85 | -.11 |
| Combination | | | | | |
| TEACCH | .268 | .205 | .689 | -.30 | .84 |
| ABA | .236 | .175 | .661 | -.25 | .72 |
| DIR | -.121 | .394 | .998 | -1.22 | .98 |
| Traditional | .482* | .132 | .004 | .11 | .85 |

The mean difference is significant at the .05 level.

Question 13 requested that the directors of special education indicate the most important measure of effectiveness. Of those responding, 57.0% indicated that inclusion or access to general education classes and curriculum was the most important; with 25.8% indicating that increased IQ scores, language, adaptive behavior skills, social skills, fine/gross motor skills, and other sub skills were the most important; followed by 5.4% indicating that decreased discipline referrals, homebound services, decreased use of private day facilities, and/or residential placement as the most important. Fourthly, 3.2% indicated that increased pass rates on SOL's,

VGLA, and VAAP were the most important measures of effectiveness. Lastly, 2.2% indicated that increased graduation rates were the most important measure of effectiveness (see Table 23).

Table 23

*Which of the Following Measures of Effectiveness is the Most Important?*

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Inclusion | 53 | 57.0 | 60.9 | 60.9 |
| Graduation | 2 | 2.2 | 2.3 | 63.2 |
| SOL's | 3 | 3.2 | 3.4 | 66.7 |
| IQ/Language | 24 | 25.8 | 27.6 | 94.3 |
| Discipline | 5 | 5.4 | 5.7 | 100.0 |
| Total | 87 | 93.5 | 100.0 | |
| Missing | 6 | 6.5 | | |
| Total | 93 | | | |

Question 14 asked respondents if they had the opportunity, would they change the current autism program. Fifty-seven of the 93 respondents answered yes for a total of 61.2%. Of those answering *yes*, twenty-six indicated that they would like to see additional training for special and general education teachers, and paraeducators. Training accounted for 45.6% of the responses. Additionally, directors of special education wanted training to be completed on autism research and specially designed programs. Two of the respondents indicated that additional staff (3.5%) was needed. Two respondents indicated that children were being misidentified (3.5%) by medical personnel. Two more respondents indicated that increased inclusion (3.5%) was needed. Singular responses accounted for 7.0% of the responses and included the removal of outside-private agencies, more services for children with mild autism, elimination of eligibility categories, and the creation of an autism only program. The remaining respondents indicated they would like to change the program, but did not provide additional details (36.8%; see Table 24).

Table 24

*If you had the Opportunity, Would you Change the Current Autism Program(s)?*

| Reported Changes | N | Percent* |
|---|---|---|
| Training for Special/General Education Teachers and Paraeducators | 26 | 45.6% |
| Additional Staff were Needed | 2 | 3.5% |
| More accurate diagnosis by medical personnel | 2 | 3.5% |
| Increased Inclusion | 2 | 3.5% |
| Other: Removal of outside agencies, more services for children with mild autism, elimination of eligibility categories, and creation of an autism only program | 4 | 7.0% |
| Answered “yes”, but did not give a reason | 21 | 36.8% |
| Total Number of Respondents who answered “yes” | 57 | 99.9%* |

*Percents were rounded to the nearest tenth.

*Demographics.* The third research question asked whether selected demographics of the school division influence the types of programs that are delivered. Stated differently, are certain programs used in metro counties while others are used in urban or rural areas. The size of the school division was recoded in SPSS 14.0 on a scale of 1-3 based upon the USDA, Economic Research Service (2003).

Table 25

*Metro, Urban, and Rural Codes*

| Code | Description |
|---|---|
| Metro counties: | |
| 1 | Counties in metro areas of 1 million population or more |
| 1 | Counties in metro areas of 250,000 to 1 million population |
| 1 | Counties in metro areas of fewer than 250,000 population |
| Nonmetro counties: | |
| 2 | Urban population of 20,000 or more, adjacent to a metro area |
| 2 | Urban population of 20,000 or more, not adjacent to a metro area |
| 2 | Urban population of 2,500 to 19,999, adjacent to a metro area |
| 2 | Urban population of 2,500 to 19,999, not adjacent to a metro area |
| 3 | Completely rural or less than 2,500 urban population, adjacent to a metro area |
| 3 | Completely rural or less than 2,500 urban population, not adjacent to a metro area |

Once the name of the school division was received, it was recoded in SPSS 14.0 (see Appendix C) as *Metro*, counties in metro areas of fewer than 250,000 population to counties in metro areas of 1 million population or more; *Urban*, population of 2,500 to population of 20,000 or more, adjacent to a metro area; or *Rural*, a population of less than 2,500 urban population, adjacent to a metro area, to completely rural, not adjacent to a metro area (USDA, Economic Research Service, 2003; see Table 25). The divisions were recoded to group school divisions serving localities of similar size and to simplify discussion of metro, urban, rural versus numerical concepts that may or may not elicit contextual representations.

Table 26 illustrates the school divisions grouped according to the population that they serve and the frequency of use of a particular program. It should be noted that respondents may or may not have responded to certain questions; therefore, missing data were omitted from analysis.

Table 26

*Frequency of Program use and Demographics*

| Program | Metro | Urban | Rural | Total |
|---|---|---|---|---|
| TEACCH | 5 | 3 | 0 | 8 |
| ABA | 9 | 1 | 1 | 11 |
| DIR | 1 | 0 | 0 | 1 |
| Traditional Special Education Services | 11 | 15 | 9 | 35 |
| Combination of Programs | 19 | 5 | 1 | 25 |
| Total | 45 | 24 | 11 | - |

Additional inquiry revealed that school divisions that serve metro areas primarily use a combination of programs to serve children with autism (42.2%), followed by traditional special education services (24.44%), then ABA (20.00%), TEACCH (11.11%), and lastly DIR Floortime (2.22%). Urban school divisions primarily use traditional special education services to serve children with autism (62.50%), followed by a use of a combination of programs (20.83%), then TEACCH (12.5%), then lastly ABA (4.16%). No urban school divisions reported primarily using DIR Floortime to serve children with autism. Rural school divisions primarily use traditional special education services to serve children with autism (81.82%), followed by ABA (9.09%), and lastly a use of a combination of programs (9.09%). No rural school divisions reported primarily using TEACCH or DIR to serve children with autism. Lastly, it should be again noted that no school divisions reported primarily using Pivotal Response or LEAP to serve children with autism (see Table 27).

Table 27

*Percentage of Program use by Demographics*

| Program | Metro | Urban | Rural |
|---|---|---|---|
| TEACCH | 11.11% | 12.50% | 0 |
| ABA | 20.00% | 4.16% | 9.09% |
| DIR | 2.22% | 0 | 0 |
| Traditional Special Education Services | 24.44% | 62.50% | 81.82% |
| Combination of Programs | 42.22% | 20.83% | 9.09% |
| Total | 99.99% | 99.99% | 100% |

This final analysis explored the relationship between the demographics of the school division and the respondents' perception of how effectively they serve children with autism. Table 28 illustrates the descriptive analysis for each of the populations and gives a mean score related to perceived effectiveness. It should be noted that 4 represented that respondents strongly agreed that their school divisions effectively served children with autism, 3 represented that respondents agreed that their school divisions effectively served children with autism, 2 represented that respondents disagreed with the statement that their school divisions effectively served children with autism, and a 1 represented that respondents strongly disagreed with the statement that their school divisions effectively served children with autism. School divisions serving metro areas received a mean score of 3.29 for perceived effectiveness with a standard deviation of .549; school divisions serving urban areas received a mean score of 2.88 for perceived effectiveness with a standard deviation of .537; and school divisions serving rural areas received a mean score of 2.91 with a standard deviation of .539.

Table 28

*Descriptive Analysis for School Divisions Serving Metro, Urban, and Rural Areas*

| | N | Mean | Std. Deviation | Std. Error | Lower Bound | Upper Bound | Minimum | Maximum |
|---|---|---|---|---|---|---|---|---|
| Metro | 45 | 3.29 | .549 | .082 | 3.12 | 3.45 | 2 | 4 |
| Urban | 24 | 2.88 | .537 | .110 | 2.65 | 3.10 | 2 | 4 |
| Rural | 11 | 2.91 | .539 | .163 | 2.55 | 3.27 | 2 | 4 |
| Total | 80 | 3.11 | .574 | .064 | 2.98 | 3.24 | 2 | 4 |

The One-Way ANOVA was completed to determine significance of findings. A comparison of the mean scores for the programs indicated that there was statistical significance $F(2, 77) = 5.424$, $p < .05$); therefore we must reject the null hypothesis that the means are equivalent. However, a One-Way ANOVA does not determine which program is more significant when the relationship of county population and school division perceived effectiveness is considered (see Table 29).

Table 29

*ANOVA for Effectiveness of School Divisions Serving Metro, Urban, and Rural Areas*

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 3.209 | 2 | 1/604 | 5.424 | .006 |
| Within Groups | 22.779 | 77 | 2.96 | | |
| Total | 25.988 | 79 | | | |

Therefore, Tukey Test of Multiple Comparison was completed to determine which population size and perceived effectiveness means were more significant. Results of post hoc testing indicated that the mean for Metro (3.29) is statistically significant from Urban (2.88) (see Table 30).

Table 30

*Multiple Comparisons for Effectiveness and School Divisions Serving Metro, Urban, and Rural Areas*

| | Mean Difference | Std. Error | Sig. | Lower Bound | Upper Bound |
|---|---|---|---|---|---|
| Metro | | | | | |
| Urban | .414* | .137 | .010 | .09 | .74 |
| Rural | .380 | .183 | .102 | -.06 | .82 |
| Urban | | | | | |
| Metro | -.414* | .137 | .010 | -.74 | -.09 |
| Rural | -.034 | .198 | .984 | -.51 | .44 |
| Rural | | | | | |
| Metro | -.380 | .183 | .102 | -.82 | .06 |
| Urban | .034 | .198 | .984 | -.44 | .51 |

## Summary of Findings

The first research question in this study inquired what programs are being used in the Commonwealth of Virginia to serve children identified with the educational disability label of autism. Approximately half of the school divisions use specially designed programs to serve children with autism (50.5%), whereas the remaining school divisions offer traditional special education services (48.4%). Furthermore, those school divisions using primarily one model to serve children with autism mostly used ABA (15.1%), followed by TEACCH (9.7%), then DIR Floortime (2.2%). Again, it should be noted that none of the school divisions reported primarily using Pivotal Response or LEAP. However, the majority of school divisions that used specially designed programs used a combination of programs to serve children with autism 31.2% of the time. Consequently, the respondents identified the needs of the students and IEP as determining the type of program used (31.2%), followed by faculty and staff training (25.8%), with available resources (19.4%) listed thirdly, with research (12.9%), combination of reasons (8.6%), and commercially available resources (1.1%) being the least reported reason.

The second research question in this study inquired, what is the degree of effectiveness of programs as perceived by directors of special education. The majority of the respondents agreed or strongly agreed that their school division effectively serves children with autism (89.3%) and feel that school personnel are effectively trained (72.0%). A majority agreed or strongly agreed that an endorsement in autism for school personnel is needed in Virginia (68.8%) and that an endorsement will improve services (72.1%). Additionally, directors of special education agreed or strongly agreed that current programming increased access to general education classes (91.4%), increased graduation rates (80..7%), increased pass rates on state testing (78.5%), increased IQ and other skills (80.7%), and decreased discipline referral and alternative placements (86.0%).

Comparing the perceived effectiveness of specific programming yielded statistically significant results. Post hoc testing revealed that the mean score for school divisions using a combination of specially designed programs ($M$ = 3.38) were significantly different from the mean score of school divisions that used traditional special education services ($M$ = 2.9).

The third research question inquired; if selected demographics of the school division influence the types of programs that are delivered. Analysis revealed that school divisions serving metro areas relied more heavily on a combination of programs (42.22%) than school divisions serving urban (20.83%) or rural (9.09%) areas. In turn, school divisions serving rural areas relied more heavily on traditional special education programs (81.82%) than school divisions serving urban (62.50%) or metro (24.44%) areas. Furthermore, metro areas appeared to use a greater variety of programming ($n$ = 5; TEACCH, ABA, DIR Floortime, Traditional Special Education Services, and Combination of Programming) than urban ($n$ = 4; TEACCH, ABA, Traditional Special Education Services, and Combination of Programming) or rural ($n$ = 3; ABA, Traditional Special Education Services, and Combination of Programs).

Finally, statistical significance was indicated for perceived effectiveness and the population of the county that the school division served. Post hoc testing revealed that the mean for school divisions providing services in metro ($M$ = 3.29) areas was statistically significant from the mean for schools serving urban ($M$ = 2.88) areas when considering perceived effectiveness.

Chapter 5 contains discussion, implications for practice, and recommendations for future research.

# Chapter 5

## FINDINGS, CONCLUSION, & DISCUSSION

The purpose of this inquiry was to investigate the extent to which specially designed programs for children with autism are being used to provide effective instruction in the Commonwealth of Virginia. Therefore, this chapter will present major findings, a conclusion, a discussion of findings with implications for practice, and recommendations for further research.

## Findings

The first research question investigated programs being used in the Commonwealth of Virginia to serve children identified with the educational disability label of autism? Analysis of data revealed that approximately half (48.4%) of respondents continue to primarily rely on traditional special education services to serve children with autism. Respondents also noted using ABA, TEACCH, the DIR Floortime model, and none of the school divisions responded that they primarily use LEAP or Pivotal Response.

The second research question investigated the degree of effectiveness of these programs as perceived by directors of special education? The questions on the survey instrument allowed examination of the origin of the programming. Respondents primarily noted that the needs of the student and the IEP primarily drives programming (31.2%). This indicates that once student needs are identified by school divisions, then programming is determined. Programs were also selected due to available resources (19.4%), faculty and staff training in a particular method (25.8%), upon research (12.9%), availability of commercial resources (1.1%), and a combination of non-specified reasons (8.6%). Most respondents strongly agreed or agreed that their school divisions effectively serve children with autism (89.3%), but that there is a continuing need for additional training in autism. When means were compared statistically, school divisions that use a combination of programs to serve children with autism perceive them to be more effective as

compared to school divisions that primarily rely on traditional special education services. Respondents felt that greater access to the general education classes and curriculum (i.e. inclusive practice) was the most important measure of effectiveness for the program.

The final research question investigated whether selected demographics of the school division influence the types of programs that are delivered? School divisions serving metro areas relied more heavily on a combination of programs (42.2%) than school divisions serving urban (20.83%) or rural (9.09%) areas. School divisions serving rural areas relied more heavily on traditional special education programs (81.2%) than school divisions serving urban (62.50%) or metro (24.44%) areas. The perceived effectiveness of programs was significant in metro school divisions. Demographic size has a bearing upon types of programming for a child with autism and the perceived effectiveness.

## Conclusion

This study was able to ascertain what programs were being used across the Commonwealth of Virginia and their perceived effectiveness. Additionally, success of programming appears to be centered on access to the general education class and curriculum for respondents. Demographics does make a difference as to the programming offered and perceived effectiveness of the program.

## Discussion

Given the U.S. Department of Education's data that during a 9 year period the disability label of autism in American schools increased 1,454.3% (U.S. DOE Twenty-fourth Annual Report to Congress, 2002), school divisions are facing a surge of children being identified with autism. This was illustrated by 98.9% of the respondents stating that their school divisions serve children with autism. This indicates that 92 of the 93 respondents serve children with autism in their school division. Moreover, it appears that school divisions vary in how they serve children

with autism. Comparatively, 50.5% of the school divisions have sought to use specially designed programs to serve children with autism while 48.4% of the school division continue to rely on traditional special education services.

The needs of the student primarily determine the type of programming (31.2%). Training in a particular methodology (25.8%) was secondary in determining type of programming. Therefore it is logical to think that since a school division is unable to manipulate the needs of students, the school division may then focus its efforts upon the training of its faculty and staff to improve outcomes. To elaborate, the number of children with autism and severity of the initial characteristics cannot be determined by the school divisions because schools accept all children living within its limits. School divisions must meet the child at the point of need. Once the need is determined, the school division must determine programming to meet the child's deficits and attempt remediation through the IEP. Since the school division must identify deficit areas and remediate, training for faculty and staff must target instructional programs and strategies that increase student ability. This implication is supported by 45.6% of those wishing to change their current programming indicated that they would increase staff training.

When inquiring as to which program is perceived to be most effective, respondents felt that a combination of programming is the most effective ($M = 3.38$). When comparing the combination programming and traditional programming, there was a statistical difference in how the participants responded. The statistically significant difference when compared to traditional special education programming was ($M = 2.90$; $F(4,88) = 3.602$, $p < .05$). The implications of these findings are that since autism is a spectrum disorder and the needs of the student and the IEP determines programming, respondents felt that a combination of specially designed programs was the most effective approach in serving children with autism. For example, the definition of autism from the DSM-IV-TR, states that there must be qualitative impairment in

social interaction, communication, and the presence of restricted repetitive and stereotyped patterns of behavior. However, impairment in social interaction may range from a basic ability to maintain eye gaze to a higher level skill such as demonstrating the ability to show emotional reciprocity. Therefore, the use of ABA (i.e., discrete trials) may be appropriate for teaching a child with autism to localize and attend to a person or object, but DIR Floortime may be more appropriate to teach a child with autism social and emotional reciprocity. Although, DIR Floortime ($M$ = 3.50); ABA ($M$ = 3.14); TEACCH ($M$ = 3.11) also had higher means that traditional special education ($M$ = 2.9); they were not considered statistically significant when compared to traditional special education programming. Tukey Test of Multicomparison could not be used to analyze DIR because of the small sample size ($n$ = 2).

Identifying the needs of the students with autism should guide the focus of training. Knowledge of specially designed programs and the strategies that they employ will then allow targeted training specific to need. This can be further explained by assessing the needs of the students in the school division and providing systematic training in diverse programming across the autism spectrum. The converse of this would be to provide a smattering of workshops in autism without focus upon the need of the students in the school division. It is imperative that faculty and staff be trained in the direct implementation of the various programs to target specific student needs. Ongoing formative evaluation will provide documentation of implementation and refinement of instruction in diverse programming for children with autism.

Demographics also impacts services that a child with autism received. School divisions serving metro areas relied more heavily on a combination of programs (42.2%) than school divisions serving urban (20.83%) or rural (9.09%) areas. In turn, school divisions serving rural areas relied more heavily on traditional special education programs (81.82%) than school divisions serving urban (62.50%) or metro (24.44%) areas. Furthermore, metro areas appeared to

use a greater variety of programming (*n* = 5; TEACCH, ABA, DIR Floortime, Traditional Special Education Services, and Combination of Programming) than urban (*n* = 4; TEACCH, ABA, Traditional Special Education Services, and Combination of Programming) or rural (*n* = 3; ABA, Traditional Special Education Services, and Combination of Programs). The implications are that given the inherent make-up, school divisions that serve metro areas may have greater flexibility of programming, greater resources, and greater access to universities that provide opportunities for systematic training.

Likewise, school divisions that serve urban areas may be grappling with an increased identification of children with autism, but may not have developed the available resources to serve this population. This may be illustrated by urban school divisions providing a greater number of programs than rural school divisions, but not as many programs as metro school divisions. It should also be noted that as the demographics change from metro to urban to rural, reliance upon traditional special education increases.

Lastly, school divisions that serve rural areas may not have, at present, the identification rates that face school divisions serving urban and metro areas. As a result, school divisions that serve rural areas may not have developed the need for the number or use of specially designed programs to serve children with autism. With increased prevalence sited by the Center for Disease Control (1:166) the number of children with autism and diverse characteristics they exhibit will impact rural school divisions. There will be a need for faculty and staff training with programming to accommodate identification rates in rural school divisions.

## Implications for Practice

Families often seek services that maximize skills while directors of special education seek programs and strategies that provide a free and appropriate public education in the least restrictive environment. Given the current data, the following implications for practice are listed:

1) School divisions that primarily rely on traditional special education services to serve children with autism should initiate the use of a combination of specially designed programs to serve children with autism. Results of this study indicated that directors of special education perceived the use of a combination of programming to be statistically more significant than traditional special education when means were compared. This can be completed by systematic training for faculty and staff in the school division. Initial assessment should be completed to determine the present needs of the students in the school division. Secondly, systematic training should take place that addresses the core deficits of autism. Thirdly, faculty and staff should be trained in diverse programs designed for children with autism in a way that will target the current needs of the students. Systematic supports should be established to ensure that specially designed programming is being implemented successfully. This may be completed through ongoing formative evaluation.
2) Schools, school divisions, and state educational authorities should provide opportunity for systematic training in diverse programming specially designed for children with autism based upon need assessments. Grants should be sought and secured to support training efforts at the state and federal levels. School divisions may support training through special education funding from the state and localities.
3) School divisions should continue to use specially designed programs and strategies for children with autism that demonstrate the ability to help them access general education classes and curriculum. Case managers should document disrupting behaviors or skill deficits that prevent access. Secondly, children with autism should be taught replacement behaviors to decrease disruptive behavior. Specially designed programming may be used to provide effective instruction with appropriate modifications and accommodations.

4) State departments of education should assist school divisions that serve urban and rural areas to systematically provide diverse programming for children with autism.

## Recommendations for Research

Many questions continue to remain with regard to programming and autism. Therefore, researchers should seek to refine and document practices that increase access to general education classes and curriculum:

1) Research should document single program success or compare several programs in the ability to assist the student to be in the general education class by measuring time, participation in the activities being completed, documenting the number and type of social interaction with peers and adults in the classroom, and the ability to assist the child in mastering the information being taught.
2) Families, special education teachers, general education teachers, paraeducators, and administrators should be surveyed to determine area of needs of the school division. The needs assessment for a school division or geographical region may then allow for systematic training to be developed.
3) Training in autism should be provided targeting rural and urban areas so that school divisions are equally able to provide effective services to children with autism regardless of county demographics. This could be initiated through pilot programs using formative evaluation and pre and posttest evaluations. Researchers could then measure the change in autism awareness, IEP content, access to general education classes, and use of specially designed programming and strategies. Follow-up assessments could then be completed in 6 month and 1-year intervals to determine how effective the training model was in sustaining growth and determining what supports are needed to sustain growth.

4) Researchers should build upon the present study by investigating how parents and teachers perceive current programming and effectiveness across demographics. Do parents and families agree with the level of effectiveness of traditional special education services, specific programming, or combination of programming? Do families and special education teachers agree with directors of special education that access to general education is the most important measure of effectiveness for a program?
5) Replication could be completed within a few years in the Commonwealth of Virginia to measure the change in use of specially designed programs in school divisions serving rural, urban, and metro areas. Replication could also be completed in other states to determine present use of specially designed programs, perceived effectiveness of the programs being used, and influence of demographics on the programs.
6) A study of the personnel who are involved in providing programs for autistic children should be conducted to determine skills with diverse programming designed for children with autism. This could be completed to develop more complex trainings for educators with advanced skills.

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# Appendix A

Table 1

Synthesis of Research for Programs that Serve Children with Autism

| Author | Date | Programming | Design | Sample Size | Findings |
|---|---|---|---|---|---|
| Lovaas | 1987 | ABA with discrete trials | Pretest/Posttest | N=19 experimental<br>N=19 control 1<br>N=21 control 2 | Experimental group that received ABA with discrete trials did significantly better than comparison groups |
| McEachin, Smith, & Lovaas | 1993 | ABA Follow-up to Lovaas 1987 | Follow-up, longitudinal | N=19 experimental<br>N=19 control 1 | Experimental group continued to outperform control |
| Howard, Sparkman, Cohen, Green, & Stanislaw | 2005 | ABA with discrete trials compated to eclectic, and nonintensive early intervention | Pretest/Posttest | N=61 | ABA did significantly better than eclectic and early nonintensive early intervention group |
| Cohen, Amerine-Dickens, & Smith | 2006 | ABA with discrete trials compated to traditional public school services | Pretest/Posttest | N=21 experimental<br>N=21 comparison | ABA group with discrete trials did significantly better in all areas |
| Koegel, Koegel, Hurley, & Frea | 1992 | Pivotal Response | Multiple Stage Baseline Design | N=4 boys | Improved self-management skills increased social responding and decreased disruptive behavior |
| Koegel, Werner, Vismary, and Koegel | 2005 | Pivotal Response | Multiple Stage Baseline Design | N=2 (1 girl, 1 boy) | Use of motivation with contextual support increased peer interaction and affect |
| Hoyson, Jamieson, & Strain | 1984 | LEAP | Pretest/Posttest | N=6 | Children made significant gains in cognition, social skills, and behavior |
| Strain & Hoyson | 2000 | LEAP | Follow-up to Hoyson, Jamieson, & Strain, 1984 | N=6 | Children maintained cognitive, social, and behavioral gains |

Appendix A

Table 1 (continued).

Synthesis of Research for Programs that Serve Children with Autism Spectrum Disorders

| Author | Date | Programming | Design | Sample Size | Findings |
|---|---|---|---|---|---|
| Schopler & Reichler | 1971 | TEACCH | Descriptive | N=10 families | Parents, specifically mothers, were adept at using TEACCH methodology in a home program |
| Panerai, Ferrante, Caputo, & Impellizzeri | 1998 | TEACCH | Pretest/Posttest | N=18 | Students made significant improvement in targeted skill domains |
| Panerai, Ferrante, & Zingale | 2002 | TEACCH compared to inclusive program | Pretest/Posttest | N=8 males in experimental group<br>N=8 males in comparison group | Experimental group made statistically significant gains as compared to comparison group |
| Greenspan & Wieder | 1997 | DIR/Floortime | Chart Review, Descriptive | N=200<br>N=20 for exceptional outcomes | 58% good to outstanding outcomes<br>25% medium outcomes<br>17% had significant difficulty |
| Wieder & Greenspan | 2005 | DIR/Floortime | Follow-up to Greenspan & Wider (1997) | N=16 | Children maintained gains from 1997 study |

Appendix B

Dear Director of Special Education:

The prevalence of children identified with autism and being served in public schools has increased 500% in a decade according to the United States Government Accountability Office (2005). Moreover, the Virginia Department of Education Special Education Advisory Council has created an ad hoc committee to study autism in the Commonwealth.

Given the current context, the attached survey seeks to investigate the extent to which specially designed programs for children with autism are being used in the Commonwealth of Virginia. Furthermore, my research questions are: (1) What programs are being used in the Commonwealth of Virginia to serve children identified with the educational disability label of autism spectrum disorder? (2) What is the degree of effectiveness of these programs as perceived by directors of special education? and (3) Do selected demographics of the school division influence the types of programs that are delivered?

This survey is part of my dissertation process at Virginia Polytechnic Institute and State University for the doctor of philosophy degree. All responses are confidential. Your name and school division will not be identified in the study; although, your school division will be grouped to similar school divisions and analyzed according to the demographics of Metro, Urban, and Rural according to the USDA, Economic Research Service.

If you would like me to share the results of my study with you, feel free to send me your e-mail address. At time of dissertation completion, you will receive a brief synopsis of the results and discussion. With all surveys, there are minimal risks in your participation in this study.

Thank you for your time and cooperation. Should you have any questions, feel free to contact me by phone at 540-674-4416 or via e-mail at rajennin@vt.edu.

Sincerely,

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## AUTISM PROGRAMMING SURVEY INSTRUMENT

*For the purpose of this inquiry **autism is defined as*** "a developmental disability **significantly** affecting verbal and nonverbal communication and social interaction, generally evident before age three, that adversely affects a child's educational performance" (*34 CFR § 300.7 © (1)).*

*Please mark the best answer only, unless directions indicate that more than one answer is allowed. Questions 1-2 inquire about respondent who is completing the form.*

1. Are you the director of special education or an individual directly responsible for special education services in your school division?

   [ ] Yes [ ] No

2. Does your school division serve children with autism?

   [ ] Yes [ ] No

*Questions 3- 6 relate to type(s) of **PROGRAMMING** for children with autism within your school division.*

3. Does your school offer a) specially designed program(s) to serve children with autism disorder or b) traditional special education services.?
   (Please circle the **most representative** answer)

   a. specially designed program(s) to serve children with autism spectrum disorders

   b. traditional special education services

4. Does your school division offer programs to serve children with autism spectrum Disorders in a) each school, b) in a centrally located area with children from various geographic regions attending, c) traditional special education services in home school, or, d) traditional special education services in a centrally located program?
   (Please circle the **most representative** answer)

   a. Eachschool has a specially designed program

   b. Programs are centrally located with children from various geographic regions attending

   c. The school division I work for offers traditional special education services for children with autism in the home school

   d. Traditional special education services in a centrally located program

5. What programs are currently used in your school division to serve children with autism? (Please circle the **most representative** answer)

   a. Teaching and Education of all Children Communicatively Handicapped (TEACCH)

   b. Applied Behavior Analysis (ABA) with discrete trials

   c. Developmental, Individual-Difference, Relationship-Based (DIR/Floortime)

   d. Pivotal Response

   e. Learning Experiences: An Alternative Program for Preschoolers and Parents (LEAP)

   f. Traditional Special Education Services (Non-specified/Eclectic)

   g. Other: (Please list) _____.

6. What determines the type of autism programming in your school district? (Please circle the **most representative** answer)

   a. Available resources (fiscal, personnel, transportation, building facilities)

   b. Faculty and staff training in a particular method

   c. Research

   d. Commercially available resources

   e. Other: (Please list)_____.

*Questions 7- 11 address the issue of **EFFECTIVENESS** of programming for children with autism.*

Please use the following Likert Scale to answers questions 7 - 14:

sa = strongly agree  a = agree  d = disagree  sd = strongly disagree

| | sa | a | d | sd |
|---|---|---|---|---|
| 7. I feel that my school division effectively serves children with autism. | [ ] | [ ] | [ ] | [ ] |
| 8. I feel that school personnel are effectively trained to serve children with autism. | [ ] | [ ] | [ ] | [ ] |
| 9. I feel that there is a need for an endorsement in Autism for school personnel in Virginia. | [ ] | [ ] | [ ] | [ ] |
| 10. I feel that an additional endorsement in autism will improve services to children and families. | [ ] | [ ] | [ ] | [ ] |

11. Which endorsement area primarily provides special education services to children with autism in your school division?

12. I feel that current programming effectively improves:

| | | | | |
|---|---|---|---|---|
| a. greater access to general education classes and curriculum (inclusive practice) | [ ] | [ ] | [ ] | [ ] |
| b. graduation rates | [ ] | [ ] | [ ] | [ ] |
| c. pass rates on SOL's, VGLA, and VAAP | [ ] | [ ] | [ ] | [ ] |
| d. IQ scores, language, adaptive behavior skills, social skills, fine/gross motor skills, and other sub skills | [ ] | [ ] | [ ] | [ ] |
| e. decreased discipline referrals, homebound services, and decreased use of private day facilities, and/or residential placement | [ ] | [ ] | [ ] | [ ] |

13. Please indicate which of the following measures of effectiveness is the most important (Please circle one).

    a. greater access to general education classes and curriculum (inclusive practice)

    b. increased graduation rates

    c. increased pass rates on SOLs, VGLA, and VAP

    d. increased IQ scores, language, adaptive behavior skills, social skills, fine/gross motor skills, and other sub skills

    e. decreased discipline referrals, homebound services, and decreased use of private day facilities, and/or residential placement

14. If you had the opportunity, would you change the current autism program(s)?

    __Yes __No

    Why?

*Questions 15 examines school division DEMOGRAPHICS.*

15. My school division is: _____

**Please remember that all information is confidential. Personal or school division identifiable information will not be included in any part of the paper. The school division will simply be grouped with similar school divisions and analyzed by groups.**

# Appendix C

## Metro, Urban, Rural Codes from the U.S.D.A., Economic Research Services

| County | Code | Re-Coded | County | Code | Re-Coded |
|---|---|---|---|---|---|
| Accomack County | 7 | 2 | Giles County | 3 | 1 |
| Albemarle County | 3 | 1 | Gloucester County | 1 | 1 |
| Alleghany County | 6 | 2 | Goochland County | 1 | 1 |
| Amelia County | 1 | 1 | Grayson County | 9 | 3 |
| Amherst County | 3 | 1 | Greene County | 3 | 1 |
| Appomattox County | 3 | 1 | Greensville County | 6 | 2 |
| Arlington County | 1 | 1 | Halifax County | 6 | 2 |
| Augusta County | 4 | 2 | Hanover County | 1 | 1 |
| Bath County | 9 | 3 | Henrico County | 1 | 1 |
| Bedford County | 3 | 1 | Henry County | 4 | 2 |
| Bland County | 8 | 3 | Highland County | 9 | 3 |
| Botetourt County | 2 | 1 | Isle of Wight County | 1 | 1 |
| Brunswick County | 6 | 2 | James City County | 1 | 1 |
| Buchanan County | 9 | 3 | King and Queen County | 1 | 1 |
| Buckingham County | 8 | 3 | King George County | 8 | 3 |
| Campbell County | 3 | 1 | King William County | 1 | 1 |
| Caroline County | 1 | 1 | Lancaster County | 9 | 3 |
| Carroll County | 6 | 2 | Lee County | 8 | 3 |
| Charles City County | 1 | 1 | Loudoun County | 1 | 1 |
| Charlotte County | 8 | 3 | Louisa County | 1 | 1 |
| Chesterfield County | 1 | 1 | Lunenburg County | 9 | 3 |
| Clarke County | 1 | 1 | Madison County | 8 | 3 |
| Craig County | 2 | 1 | Mathews County | 1 | 1 |
| Culpeper County | 6 | 2 | Mecklenburg County | 7 | 2 |
| Cumberland County | 1 | 1 | Middlesex County | 8 | 3 |
| Dickenson County | 9 | 3 | Montgomery County | 3 | 1 |
| Dinwiddie County | 1 | 1 | Nelson County | 3 | 1 |
| Essex County | 8 | 3 | New Kent County | 1 | 1 |
| Fairfax County | 1 | 1 | Northampton County | 9 | 3 |
| Fauquier County | 1 | 1 | Northumberland County | 9 | 3 |
| Floyd County | 8 | 3 | Nottoway County | 6 | 2 |
| Fluvanna County | 3 | 1 | Orange County | 6 | 2 |
| Franklin County | 2 | 1 | Page County | 6 | 2 |
| Frederick County | 3 | 1 | Patrick County | 8 | 3 |

Metro, Urban, Rural Codes from the U.S.D.A., Economic Research Services

| County | Code | Re-Coded | County | Code | Re-Coded |
|---|---|---|---|---|---|
| Pittsylvania County | 3 | 1 | Colonial Heights city | 1 | 1 |
| Powhatan County | 1 | 1 | Covington city | 6 | 2 |
| Prince Edward County | 6 | 2 | Danville city | 3 | 1 |
| Prince George County | 1 | 1 | Emporia city | 6 | 2 |
| Prince William County | 1 | 1 | Fairfax city | 1 | 1 |
| Pulaski County | 3 | 1 | Falls Church city | 1 | 1 |
| Rappahannock County | 8 | 3 | Franklin city | 6 | 2 |
| Richmond County | 9 | 3 | Fredericksburg city | 1 | 1 |
| Roanoke County | 2 | 1 | Galax city | 6 | 2 |
| Rockbridge County | 6 | 2 | Hampton city | 1 | 1 |
| Rockingham County | 3 | 1 | Harrisonburg city | 3 | 1 |
| Russell County | 6 | | Hopewell city | 1 | 1 |
| Scott County | 3 | 1 | Lexington city | 6 | 2 |
| Shenandoah County | 6 | 2 | Lynchburg city | 3 | 1 |
| Smyth County | 6 | 2 | Manassas city | 1 | 1 |
| Southampton County | 6 | 2 | Manassas Park city | 1 | 1 |
| Spotsylvania County | 1 | 1 | Martinsville city | 4 | 2 |
| Stafford County | 1 | 1 | Newport News city | 1 | 1 |
| Surry County | 1 | 1 | Norfolk city | 1 | 1 |
| Sussex County | 1 | 1 | Norton city | 7 | 2 |
| Tazewell County | 7 | 2 | Petersburg city | 1 | 1 |
| Warren County | 1 | 1 | Poquoson city | 1 | 1 |
| Washington County | 3 | 1 | Portsmouth city | 1 | 1 |
| Westmoreland County | 7 | 2 | Radford city | 3 | 1 |
| Wise County | 7 | 2 | Richmond city | 1 | 1 |
| Wythe County | 6 | 2 | Roanoke city | 2 | 1 |
| York County | 1 | 1 | Salem city | 2 | 1 |
| Alexandria city | 1 | 1 | Staunton city | 4 | 2 |
| Bedford city | 3 | 1 | Suffolk city | 1 | 1 |
| Bristol city | 3 | 1 | Virginia Beach city | 1 | 1 |
| Buena Vista city | 6 | 2 | Waynesboro city | 4 | 2 |
| Charlottesville city | 3 | 1 | Williamsburg city | 1 | 1 |
| Chesapeake city | 1 | 1 | Winchester city | 3 | 1 |

Metro, Urban, Rural Codes from the U.S.D.A., Economic Research Services

| Code | Description |
|---|---|
| Metro Counties: | |
| 1 | Counties in metro areas of 1 million population or more |
| 2 | Counties in metro areas of 250,000 to 1 million population |
| 3 | Counties in metro areas of fewer than 250,000 population |
| Urban Counties: | |
| 4 | Urban population of 20,000 or more, adjacent to a metro area |
| 5 | Urban population of 20,000 or more, not adjacent to a metro area |
| 6 | Urban population of 2,500 to 19,999, adjacent to a metro area |
| 7 | Urban population of 2,500 to 19,999, not adjacent to a metro area |
| Rural | Counties: |
| 8 | Completely rural or less than 2,500 urban population, adjacent to a metro area |
| 9 | Completely rural or less than 2,500 urban population, not adjacent to a metro area |

The Re-Coded Codes for Metro, Urban, and Rural School Divisions as analyzed by SPSS 14.0

| Code | Description |
|---|---|
| Metro counties: | |
| 1 | Counties in metro areas of 1 million population or more |
| 1 | Counties in metro areas of 250,000 to 1 million population |
| 1 | Counties in metro areas of fewer than 250,000 population |
| Urban Counties: | |
| 2 | Urban population of 20,000 or more, adjacent to a metro area |
| 2 | Urban population of 20,000 or more, not adjacent to a metro area |
| 2 | Urban population of 2,500 to 19,999, adjacent to a metro area |
| 2 | Urban population of 2,500 to 19,999, not adjacent to a metro area |
| Rural | Counties: |
| 3 | Completely rural or less than 2,500 urban population, adjacent to a metro area |
| 3 | Completely rural or less than 2,500 urban population, not adjacent to a metro area |

Key:

County: Indicates where the school division is located.

Code: Indicates the original 1-9 code listed by the USDA, Educational Research Services

Re-Coded: Indicates the re-coding of school divisions in order to be grouped into the constructs Metro, Urban, and Rural.

# Appendix D

## IRB Exempt Approval

VirginiaTech

**Office of Research Compliance**
1880 Pratt Drive (0497)
Blacksburg, Virginia 24061
540/231-4358 Fax: 540/231-0959
E-mail: ctgreen@vt.edu
*www.irb.vt.edu*
FWA00000572( expires 7/20/07)
IRB # is IRB00000667.

DATE: October 5, 2006

MEMORANDUM

TO: Glen Earthman
Randy Jennings

FROM: Carmen Green

SUBJECT: **IRB Exempt Approval:** "Autism Programs in the Commonwealth of Virginia: From Theory to Practice" , IRB # 06-499

I have reviewed your request to the IRB for exemption for the above referenced project. I concur that the research falls within the exempt status. Approval is granted effective as of October 5, 2006.

As an investigator of human subjects, your responsibilities include the following:

1. Report promptly proposed changes in previously approved human subject research activities to the IRB, including changes to your study forms, procedures and investigators, regardless of how minor. The proposed changes must not be initiated without IRB review and approval, except where necessary to eliminate apparent immediate hazards to the subjects.

2. Report promptly to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

cc: File